



Dr. M.J. JOHN CENTENARY CHAPEL

MISSION STATEMENT

"To impart holistic education founded on Christian values to all students without discrimination especially the less privileged in moulding a character to emerge as a self-reliant, enlightened, empowered and change-agents of the society".



CSI VELLORE DIOCESE VOORHEES COLLEGE

Estd. 1898



VOORHEES COLLEGE
VELLORE
ESTD-1898

CALENDAR 2019 - 2020

A TRIBUTE ...



MR. RALPH VOORHEES



MRS. ELIZABETH VOORHEES

The amalgamation of the old Arcot Academy at Ranipet and the Church of Scotland Mission High School into the Arcot Mission High School in 1893 sowed the seed for the germination of the Arcot Mission College. In 1905 Mr. Ralph Voorhees, a friend of the College in the US offered a generous gift of \$25,000 and a further contribution of \$10,000 in 1915 enabled the then missionary-staff to construct suitable buildings for the college. The name of the institution was changed after the donor's wife and was called 'Elizabeth Rodman Voorhees College'. Later it came to be known as VOORHEES COLLEGE.

VOORHEES COLLEGE VELLORE

Estd.1898

Phone : 0416 - 2220317

Website : www.voorheescollege.edu.in

Email : voorhees1898@gmail.com



CALENDAR
2019-2020

WORKING HOURS

Morning Devotion : 8.45 a.m. - 9.05 a.m.

Shift I : 9.10 a.m. - 2.00 p.m.

(Aided Stream)

Afternoon Devotion : 1.35 p.m. - 1.55 p.m.

Shift II : 2.00 p.m. - 6.50 p.m.

(Unaided Stream)

COLLEGE OFFICE HOURS

Monday to Friday : 9.00 a.m. to 5.00 p.m.

Phone : 0416-2220317

Fax : 0416-2220318

E mail : voorhees1898@gmail.com

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NATIONAL PLEDGE

India is my country. All Indians are my brothers
and sisters.

I love my country and I am proud of its rich and
varied heritage. I shall always strive to be worthy of it.

I Shall give my parents teachers and all elders
respect and treat every one with courtesy.

To my country and my people I pledge my
devotion, In their well being and prosperity alone lies
my happiness.

நாட்டுப்பண்

ஐன கண மன அநிநாயக ஜய ஹே

பாரத பாக்ய விதாதா

பஞ்சாப எரிந்து குஜராத மராட்டா

திராவிட உத்கல வாங்கா

விரிந்திய ஹிமாசல யமுணா கங்கா

உச்சல ஜலதி தரங்கா

தவ சுப நாமே ஜாகே

தவ சுப ஆசிஸு மாகே

காஹே தவ ஜய காதா

ஐன கண மங்கள தாயக ஜய ஹே

பாரத பாக்ய விதாதா

ஜய ஹே ஜய ஹே ஜய ஹே

ஜய ஜய ஜய ஜய ஹே

- மகாகவி இரவீந்திரநாத் தாகூர்

தமிழ்த்தாய் வாழ்த்து

நீராரும் கடலுடுத்த நிலமடந்தைக் கெழிலொழுகும்
சீராரும் வதனமெனத் திகழ்பரதக் கண்டமீதில்
தெக்கணமும் அதிற்சிறந்த திராவிடநல் திருநாடும்
தக்கசிறு பிறைநதலும் தரித்தநறுந் திலகமுமே !
அத்திலக வாசனைபோல் அனைத்துலகும்இன்பமுற
எத்திசையும் புகழ்மணக்க இருந்தபெருந்
தமிழணங்கே ! தமிழணங்கே !

உன் சீரிளமைத் திறம் வியந்து
செயல்மறந்து வாழ்த்துதுமே !
வாழ்த்துதுமே ! வாழ்த்துதுமே !

- மனோன்மணியம் பெ.சுந்தரனார்

தேசிய ஒருமைப்பாட்டு உறுதிமொழி

"நாட்டின் உரிமை வாழ்வையும் ஒருமைப்பாட்டையும்
பேணிக் காத்து வலுப்படுத்தச் செயற்படுவேன்" என்று
உளமார நான் உறுதி கூறுகிறேன்.
"ஒருபோதும் வன்முறையே நாடேன் என்றும், சமயம்,
மொழி, வட்டாரம் முதலியவை காரணமாக எழும்
வேறுபாடுகளுக்கும் பூசல்களுக்கும் ஏனைய அரசியல்
பொருளாதாரக் குறைபாடுகளுக்கும் அமைதி
நெறியிலும் அரசியல் அமைப்பின் வழியிலும் நின்று
தீர்வு காண்பேன்" என்றும் நான் மேலும்
உறுதியளிக்கிறேன்.

Our father, who art in heaven,
hallowed be thy name; thy kingdom come; thy
will be done in earth as it is in heaven. Give us
this day our daily bread. And forgive us our
trespasses, as we forgive them that trespass
against us. And lead us not into temptation, but
deliver us from evil, for thine is the kingdom,
the power and the glory, for ever and ever.
Amen.

"God so loved the world that He gave
His one and only Son JESUS CHRIST that
whoever believes in Him shall not perish but
have eternal life." Bible

"Come to me, all you who are weary
and burdened, and I will give you rest" - Jesus
Christ

"Hatred ever kills, Love never dies.
Such is the vast difference between the two.
What is obtained by love is retained for all time.
What is obtained by hatred proves a burden in
reality, for it increases hatred. The duty of a
human being is to diminish hatred and to
promote love".

- Mohandas K. Gandhi

COLLEGE CREED

*This is our College,
Let peace dwell here,
Let the room be full of contentment
Let love abide here
Love of one another,
Love of mankind,
Love of life itself,
And love of God.
Let us remember
That as many hands build a house,
So many hearts make a College.*

COLLEGE MOTTO

"IN VAIN WITHOUT GOD"

COLLEGE ANTHEM

O Voorhees College ever dear
To every heart who studies here,
In fellowship we stand and raise
This simple song of living praise.

In service, love and loyalty
Our mother India is free,
In God united we prevail;
The needs are great; we must not fail.

Let conflict here among us cease,
May brotherhood and love increase!
As sons and daughters we will strive
To keep this song, our prayer, alive.

O Voorhees College ever dear
May everyone who studies here,
In service pledge his heart and hand
To prosper thee and dear homeland.

- Rev. Blaise Levai.

பேராயம்பண்

உலகில் எங்கெங்கு பெருமை - எங்கள்
மீட்பர் சுமந்த அந்தச் சிலுவை!
பலகலை தேர்ந்தாலும், பொன் பொருள் சேர்ந்தாலும்
பெயர் புகழ் தேர்ந்தாலும், அரசெனைச் சார்ந்தாலும்
- உலகில்

1. அன்பின் அடையாளம் ஆவதனால் பிறர்க்கு
ஆவியும் அன்பால் ஈவதனால்
இன்பப் பெருவாழ்வு காட்டுவதால் - எமை
மாற்றுவதால் - நலம் - கூட்டுவதால்
- உலகில்
2. சிலுவை சிலுவையென்றே நாவசையும் - சிந்தை
பேராயம் இயேசு தொண்டு நாளும் செய்யும்
இலகும் விவிலியம் அடிப்படையே அதன்
நெறிப்படியே - கற்ற - உரைப்படியே
- உலகில்
3. ஏற்றிய விளக்கும் நீங்கள் என்றார் - நமை
இயேசு இவ்வுலகிடைப் போங்கள் என்றார்!
நாற்றிசையும் அதை ஒளிர வைப்போம் - எங்கள்
எளியவர்க்கும் - நல்ல வழியுரைக்கும்
- உலகில்
4. தூணென விழுதுடை ஆலமரம் - சிறு
சிறு துகும்பெனும் விதையின் மூலம் வரும்
வானரஞ்சு ஆலமரம் தழைத்திடவே - நம்மை
விதைத்திடுவோம்-தொடர்ந்து உழைத்திடுவோம்
- உலகில்
5. நொத்தவர் நொடித்தவர் பிணியகற்றி உயர்
நேர்வழிக் கல்வி தனைப் புகட்டி
இந்திய மண் கிறிஸ்துவுக்குடமை - செயல்
அருள் முறைமை - அது - நம் கடமை
- உலகில்

PERSONAL MEMORANDUM

Name :

Date of Birth :

Department :

Page : Reg.No :

College / Shift - I / Shift - II.....

Father's / Guardian's Name :

Residential Address :

.....

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From the Desk of the Bishop and Chairman

The phase of intense competition involving an unavoidable race for excellence in education has arrived. The hard decision of choosing the college has to be made by the student. Quality education or quality in education is the focus for every institution.

Voorhees College, named after a blind philanthropist's wife from the U.S.A, is founded on Christian ethics and principles. The College steeped in rich tradition, has always stood tall on its vision and values, in its long existence of 120 years. Thousands of successful alumni who went through the portals of this College, have immensely enriched and empowered our nation. The College, also my Alma Mater, is now poised to reinvent itself as we are on the cusp of a

learning revolution which aims to completely overhaul the country's education system in the wake of the dawn of an era of technological development.

India is the world's largest country with 600 million under the age 25, which is a rich demographical dividend.

I wish and pray that we strive to successfully prepare ourselves to produce future-proof students to welcome the new era.

Let us 'teach them' (God's Commandment) Deut. 11:9

Let us instill 'life' in our students for, life is a test.

Rt. Rev. H.Sharma Nithiyanandham

CSI Bishop in Vellore
Chairman & Secretary
Voorhees College

PRINCIPAL'S MESSAGE

Give Meaning to.....!

"The meaning of life is to give life a meaning"says Viktor E.Frankl a psychiatrist and holocaust survivor. He believes that the lack of any meaning in life is a cause for serious illness like depression. Giving meaning to your life is not an easy task. It is not same thing that happens at a given point in your life, but it demands an endless search with patience and courage, so be prepared to face hardships, criticism failures and even unhappiness. But always remember to learn from the past, live the present and move to the future with hope.

There is always beginning for anything and everything that you plan to do. A God beginning gives you confidences and thus an edge, keeping you on track, whereas a bad start will impede progress, causing much discouragement and apathy. Even if it takes considerable time, make sure to start well, so that with half the job already done, the remaining would be a case walk.

Life is not about what happens it is rather about how you choose to respond to what happens to you. Further you alone can

manage the use of your time only by choosing to take change of the things you do. Don't ever make the mistake of allowing situation, things and people to determine how you use your time. Life manage management begins with the willingness and the ability to discipline yourself.

Your action is absolutely essential for making possible every success that you want to active in life.

Life generally doesn't give you what you want; rather it gives you what you choose for yourself. You have the power to choose the type of life you want to live. Everything in your life is the result of a choice you have made. So for an exceptionally beautiful life make the appropriate choice. Let us remember, life is a journey that will have many unexpected twists and turns, surprises and successes that make it worth and the struggles.

Birth is not your choice
Death will not be your choice
But how to live a life is absolutely your choice!

Dr. A.Nelsonvimalanathan
Principal-i/c

VOORHEES COLLEGE

Voorhees College is a first grade College affiliated to Thiruvalluvar University, Vellore. It is a minority institution, established by the American Arcot Mission of the Reformed Church in America, administered by a Governing Board with the C.S.I. Bishop in Vellore Diocese as the Chairman.

The College admits all students belonging to every community and creed. Their religious sentiments and freedom of conscience are respected. The College lays importance on character building and the development of the whole personality of young people.

A BRIEF HISTORY

Voorhees College incepted in 1898, is one among the several institutions founded by the American Arcot Mission of the Reformed Church in America. Rev.Dr.W.I.Chamberlain, of the Arcot

Mission was the First Principal. With the magnificent gift of Rs.75,000/- by missionary Ralph Voorhees, the main building for the College was constructed and was named in memory of the donor's wife Elizabeth R. Voorhees.

The institution was started as an Intermediate College and it has now grown into a Postgraduate institution. It offers B.A. Economics, B.Sc., Mathematics, B.Sc., Physics, B.Sc., Zoology (1957), B.Com., (1970), B.A., Defence Studies (1976), B.A., History and B.Sc. Chemistry (1978), B.A. Tamil (1982) and B.A. English (1985) M.Sc., Mathematics, M.Com., (1977), M.A. History (1986) and M.Sc., Zoology (1987) in Shift - I.

In order to facilitate the needs of the deserving students of the rural community the College offers Undergraduate and Postgraduate courses in the shift - II self-financing stream. They are B.Com (1985), B.Sc., Computer Science (1994), B.B.A.(2004), B.C.A., B.Sc. Botany (2007),

B.S.W., B.A. Tamil, B.Sc., Chemistry (2017), B.Sc., Physics (2018), M.Sc. Physics (1991), M.A., Tamil (2003), M.Sc. Chemistry (2004), M.S.W. (2005), M.A., English, M.A., Economics (2013), M.A., Defence (2014), M.Sc., Com.Sci., (2015) and the College is under Semester system since the academic year 2007 - 08.

Research Programmes leading to M.Phil and Ph.D. Degrees have also been started in the Postgraduate Departments of the College.

SYSTEM OF EDUCATION

The Objective of the College is to provide a sound secular education based on Christian values to train young men and women for the service of the country and community. Religious instruction based on the Bible is an integral part of the curriculum for Christian students. Alternative courses in Moral Instruction are provided for other Students.

MOTTO AND OBJECTIVES

Nisi Dominus Frustra in Latin is the motto of the institution. The English version is given as "In Vain without God". The Motto on the emblem links this institution with the lofty ideals of its founding fathers who have learnt the ever necessary lesson that "it is not by might nor by power but by the Spirit".

THE COAT OF ARMS

The coat of arms of the institution is simple and dignified. The traditional lotus plant portrays a sign of purity and integrity; the plant lying down is blue, signifying aspiration towards heavenly things. The letters VC (Voorhees College) beside Cross on which Jesus died are symbols of Love. The lamp and the red colour background signify the flame of knowledge.

ADMINISTRATION

THE COLLEGE GOVERNING BOARD

The Rt. Rev. H.Sharma Nithiyanandham
Bishop in Vellore, CSI Vellore Diocese
Chairman & Secretary, Voorhees College.

Dr. A.Nelsonvimalanathan
Principal - i/c

Rev. Dr. I.Isaac Kathirvelu
Vice-President, CSI Vellore Diocese

Rev. N.Sampath Sadhanantham
Hon' Secretary, CSI Vellore Diocese

Mr. T.Sundarraaj
Hon' Treasurer, CSI Vellore Diocese

Dr. J.Annie Kamala Florence
Vice Principal (Shift-I)

Dr. S.Caleb Noble Chander
Bursar

Mr. A.Russell Premraj Benjamin
Vice Principal (Shift-II)

Mr. D.Job Kanagaraj
Diocesan Council Representative

Mr. Andrew Sam Rathna Singh

Diocesan Council Representative

Mr. Chelladurai

Bishop's Nominee

Mr. J. Ebenezer

H.M. Voorhees Hr.Sec. School, Vellore.

Staff Representative

Staff Representative

Rev. George Edwin

Eastern Area Council Representative

Mr. D.Johnson Babu

Central Area Council Representative

Mr. G.Vidya Sagar

Northern Area Council Representative

Dr. S.Armstrong

Southern Area Council Representative

Rev. B. B. C. Kumar

RCA Representative, U.S.A

Thiruvallur University Representative :-

SENATUS OF THE COLLEGE

Dr. A.Nelsonvimalanathan

Principal-i/c

Dr. J.Annie Kamala Florence

Vice-Principal (Shift-I)

Mr. A.Russell Premraj Benjamin

Vice-Principal (Shift-II)

Dr. S.Caleb Noble Chandar

Bursar

HEADS OF DEPARTMENT

Dr. A.Theodore Rajkumar

Department of Tamil

Ms. J.Christina Yakkal Sarojini

Department of English

Mr. Y.David Naresh Benjamin

Department of History

Dr. P.Anbalagan

Department of Economics

Mr. D.Thirumaran

Department of Defence Studies

Ms. E.Roseline Gladis Siromani

Department of Mathematics

Dr. D.Jaikumar

Department of Physics

Dr. J. Annie Kamala Florence

Department of Chemistry

Dr. D. Anusuya

Department of Zoology

Dr. A. Nelsonvimalanathan

Department of Commerce

Dr. B. S. Selvakumar

Department of Political Science

Ms. B. Angelin Vijayakumari

Department of Botany

Mr. A. Russell Premraj Benjamin

Department of Computer Science

Dr. Y. Edison Nesadoss

Department of Social Work

Mr. S. Sathianathan Prasanna

Department of Business Administration

Mr. M. Amen Raj

Department of Computer Application

Librarian

Dr. N. Anbu

Department of Physical Education

Dr. A. Duke John David

Warden (Men)

Ms. D. Jaya Selva Rani

Dy. Warden (Women)

Two Permanent Members of Teaching Faculty

1.

2.

Dr. Annie Kamala Florence

Dean of Research

Dean of Sciences

Mr. A. Theodore Rajkumar

Dean of Humanities

Dr. A. Nelsonvimalanathan

Dean of Religious Work

Dr. P. Anbalagan

Dean of Student Affairs (Shift-I)

Dr. Edison Nesadoss

Dean of Student Affairs (Shift-II)

Mr. Y. David Naresh Benjamin

Controller of Examinations

Dean of Women Students (Shift-I)

Ms. J. P. Evelin Freeda

Dean of Women Students (Shift-II)

Mr. A. Russell Premraj Benjamin

Co-ordinator (Shift-II)

Mr. M. Amen Raj

Alumni Officer

STUDENT WELFARE COUNCIL

The Student Welfare Council has been functioning effectively from 1982 – 83

The Council consist of 31 Student Representatives, One from each Department UG & PG, nominated by the faculty members of the Department, Parent Representatives, a Revenue and Police Official & 16 Staff Representatives. The Principal is the Chairman of the Council and will meet whenever necessary to discuss and implement the suggestions put forward by the student community.

Chairman :

Dr. A.Nelsonvimalanathan

Principal-i/c

Deans of Student Affairs :

1. **Dr. P.Anbalagan** (Shift-I)

2. (Shift-I)

3. **Dr. D.Edison Nesadoss** (Shift-II)

4. **Ms. Evelin Freeda** (Shift-II)

STUDENT REPRESENTATIVES 2019-20

| | | |
|-------------|----|---|
| Tamil | UG | : Ms. D.Yoga Prakash, III B.A |
| | UG | : Mr. M.Ajith Kumar, III B.A |
| | PG | : Ms. K.Priya, II M.A |
| English | UG | : Mr. S.Sam Mercantire, III B.A |
| | PG | : Ms. Y.Jenifer, II M.A |
| History | UG | : Ms. K.Vinitha, III B.A |
| | PG | : Mr. L.Edward Joatham, II M.A |
| Economics | UG | : Ms. J.Mahalakshmi, III B.A |
| | PG | : Ms. Priyadhashini Ghana Sekar, II M.A |
| Defence | UG | : Mr. J.Jaya Prakash, III B.A |
| | PG | : Mr. J.Glory Cinthja, II M.A |
| Commerce | UG | : Mr. P.Suresh, III B.Com |
| | PG | : Mr. P.Dhayalan, II M.Com |
| Mathematics | UG | : Mr. Yuvaraj, III B.Sc |
| | PG | : Mr. M.Jagadeeswari, II M.Sc |
| Physics | UG | : Mr. V.Silas Ebinezer, III B.Sc |
| | PG | : Mr. R.Manoj, II M.Sc |
| Chemistry | UG | : Mr. R.Dhanasekar, III B.Sc |
| | PG | : Mr. R.Manoj, II M.Sc |
| Zoology | UG | : Mr. N.Nilavarasan, III B.Sc |
| | PG | : Mr. C.Jonah Jeba Singh, II M.Sc |
| Botany | UG | : Mr. S.Ponnarasan, III B.Sc |
| | PG | : Mr. Rohini, II M.Sc |
| Com.Science | UG | : Mr. M.Madhan Raj, III B.Sc |
| | PG | : Mr. S.Kanalarasu, II M.Sc |
| B.B.A | UG | : Mr. M.Udesh Balan, III B.B.A |
| Social Work | UG | : Mr. G.Krishna Kumar, III B.S.W |
| | PG | : Mr. S.Kanalarasu, II M.Sc |
| B.C.A | UG | : Mr. E.Ezra Pathros Jason, III B.C.A |

Representation

| | |
|------------------------|---|
| Parents | : |
| The Revenue Department | : |
| The Police Department | : |

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| | |
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| English | : Dr. B.Allen David Isaiaik |
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| Economics | : Mr. A.Yakob |
| Defence | : Dr. Mani Jayaraman |
| Commerce | : Mr. Sanjay Subramani |
| Mathematics | : Dr. S.Christopher |
| Physics | : Mr.D.K.Andrew Prasanna Kumar |
| Chemistry | : Mr. S.Daniel Deva Sangeeth |
| Zoology | : Mrs. S.Valli |
| Botany | : Mr. J.Altrin Jay Prasanth |
| Com.Science | : Mr. P.Magesh Prabhu |
| B.B.A | : Ms. C.S.Sandhya Preethi Christina |
| Social Work | : Dr. Simon Philip |
| B.C.A | : Mrs. B.Sudha |

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| Joint Sec | : Ms. R.Nishanthi, II M.A |
| Joint Sec | : Ms. S.Swetha, II M.A |

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| Secretary | : Mr. S.Joyson, III B.A |
| Joint Sec | : Ms. M.Elakiya, II M.A |

History

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| Secretary | : Mr. S.Vignesh, III B.A |
| Joint Sec | : Ms. A.Archana Devi, II M.A |

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| President | : Dr. Jayeshella Prakash |
| Secretary | : Mr. B.Thiyaneswaran, III B.A |
| Joint Sec | : Mr. V.Anandbabu, II M.A |

Defence

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| Secretary | : Mr. K.Gnanavel, III B.A |
| Joint Sec | : Mr. S.P.V.Karansuriya Varma, II M.A |

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| Secretary | : Mr. V.Shiyam Nithya Kumar, III B.Com |
| Joint Sec | : Mr. N.Jagadish, II M.Com |

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| Secretary | : Ms. S.Jaya Suriya, III B.Sc |
| Joint Sec | : Mr. N.Rajesh, II M.Sc |

Physics

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| President | : Dr. M.Paul Dinakaran |
| Secretary | : Mr. R.Rufus Chelliah, III B.Sc |
| Joint Sec | : Mr. J.Candyda, II M.Sc |

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B.C.A

President : Mr. S.Nambi
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Principal-i/c, HOD of Commerce,

NSS Co-ordinator & Dean of Religious Works

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Assistant Professor, HOD & Dean of Humanities

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Assistant Professor & HOD

Mr. R.Gowtham Raja Sathish, M.A., M.Phil.,
Assistant Professor

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Assistant Professor, HOD & Principal-i/c

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Assistant Professor

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Assistant Professor

Mr. B.Nirmal Prasanna, M.Com.,
Assistant Professor

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Librarian

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Assistant Professor

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Assistant Professor

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Assistant Professor

**PG & RESEARCH
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Assistant Professor

Ms. S.Valli, M.Sc., M.Phil.,
Assistant Professor

**PG & RESEARCH
DEPARTMENT OF ECONOMICS**

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Mr. A.Yakob, M.A., M.Phil., B.Ed.,
Assistant Professor

Mr. V.Anantha Babu, M.A., B.Ed.,
Assistant Professor

Ms. Lakshmi Priya, M.A., M.Phil.,
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AND STRATEGIC STUDIES**

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Assistant Professor

Dr. K.Udayakumar, M.A., M.Phil., Ph.D.,
Assistant Professor

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Assistant Professor

Ms. J.P.Evelyn Freeda, M.Com., M.Phil., B.Ed.,
Assistant Professor & Dean of Women Students

Ms. C. Gajalakshmi, M.Com., M.Phil., NET
Assistant Professor

Mr. S. Aaron Prasath, M.Com.,
Assistant Professor

Ms. Hepzibha Gnana Synthiya, M.Com., M.Phil., NET
Assistant Professor

PG DEPARTMENT OF COMPUTER SCIENCE

Mr. A. Russell Premraj Benjamin, M.C.A., M.Phil.,
Assistant Professor, HOD, Co-ordinator (Shift - II) &
Vice Principal (Shift-II)

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Assistant Professor

Ms. V. Ruckmani, M.Sc., M.Phil.,
Assistant Professor

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Assistant Professor

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Assistant Professor

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Assistant Professor

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Assistant Professor

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PG & RESEARCH DEPARTMENT OF SOCIAL WORK

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Dean of Student affairs (Shift-II)

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Assistant Professor

Ms. Lydia Joseph,
Assistant Professor

Dr. Simon Philip, MSW, M.Phil, Ph.D.,
Assistant Professor

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Assistant Professor

Ms. C.S. Sandhya Preethi Christina, M.B.A.,
Assistant Professor

Mr. C.Collin Crispin, M.B.A., M.Com.,
Assistant Professor

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Superintendent M.A., M.Phil., CCOM., C.O.A., H.D.C.A., B.A(Eng)

Ms. C. Joice Parimala
Assistant

Mr. G.Inbanathan, B.Com., M.A.,
Assistant

Mr. M.D.Mahimairaj
Assistant

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Typist, S.G.

Mr. A.Suresh
Typist

Mr. L. Joseph Beski, B.Com., PGDCE.,
Junior Assistant

Mr. S.Veeramani
Junior Assistant

Mr. M.Madhanraj
Junior Assistant

Mr. T.Arigan
Store Keeper

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Lab Assistant S.G.

Ms. D.Indra Gandhi, M.A.,
Lab Assistant

Ms. P.Gnana Kalai Arasi
Lab Assistant

Mr. D.Rajan Babu
Lab Assistant

Mr. S.Gangadharan
Lab Assistant

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Mr. P.Andrew Anandaraj

Lab Assistant

Mr. K.Kumar

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Mr. J. Selva Pandiyan

Lab Assistant

Mr. C.Panneerselvam

Record Clerk

Mr. W.M.Godwin Premkumar

Record Clerk

Mr. W.Augustin William

Lab Assistant

Ms. C.Velanganni

Record Clerk

Mr. P.Rajendaran

Library Assistant

Mr. P.Selvaraj

Office Assistant, Spl.Gr.

Mr. K.Srinivasan

Office Assistant

Mr. A.Srinivasan

Office Assistant

Mr. S.Ramaraj

Watchman, Spl.Gr.

Mr. D.Sathi

Gardener, Spl.Gr.

Mr. M.Sekar

Games Marker

Mr. K.Selvam

Games Marker, S.G.

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Chairman

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Member from Management

Dr. J.Annie Kamala Florence, Vice Principal (Shift-I)
Senior Administrative Officer

Mr. A.Russell Premraj Benjamin, Vice Principal (Shift-II)
Senior Administrative Officer

Dr. S.Caleb Noble Chandar, Bursar
Senior Administrative Officer

Dr. D.Jaikumar, HOD, Physics
IQAC Coordinator

Dr. P.Anbalagan, HOD, Economics
Representative : Criterion I

Dr. K.Kishore, Assistant Professor
Representative : Criterion II

Dr. M.Job Gopinath, Assistant Professor
Representative : Criterion III

Mr. D.Thirumaran, HOD, Defence and Strategic Studies
Representative : Criterion IV

Dr. J.Annie Kamala Florence, Vice Principal (Shift-I)
Representative : Criterion V

Dr. Binu Anitha Joseph, Assistant Professor
Representative : Criterion VI

Dr. R.Annie Vidhya, Assistant Professor
Representative : Criterion VII

Nominee From Local Society

Nominee From Students

Dr. D.Daniel Ezhilarasu,
Nominee From Alumni

Mr. Ebinasar Sundaraj
Nominee from Employers / Industrialists / Stake Holders

Grievance Redressal Committee

| | | |
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| Chairman | : | Dr. A.Nelsonvimalanathan |
| Vice Principal (Shift-I) | : | Dr. J.Annie Kamala Florence |
| Vice Principal (Shift-II) | : | Mr. A.Russell Premraj Benjamin |
| Bursar | : | Dr. S.Caleb Noble Chandar |
| Dean of Student Affairs | : | Dr. P.Anbalagan |
| Dean of Humanities | : | Mr. A.J.Theodore Rajkumar |
| Dean of Sciences | : | |
| Dean of Women | : | |
| Controller of Exams | : | Mr. Y.David Naresh Benjamin |
| Superintendent | : | Mr. A. Krishnamurthi |

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| | | |
|-------------------------|---|---|
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| Civil Administration | : | Tahsildar, Vellore |
| Police Administration | : | Inspector, Vellore -South |

- Local Media : Mr. R.Sendil Kumar
The Hindu, Press
- NGO's : Rtn. R.Sridar Balaraman,
District Governor, R.I.Dist.3231
- P.A. to Collector : Vellore Dist. (M) 9445043221

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- Mr. A.Russell Premraj Benjamin, Vice Principal (Shift-II)
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Dean of Women Students (Shift-I)
- Dr. Edison Nesadoss, Dean of Students Affairs (Shift-II)
- Ms. J.P.Evelin Freeda, Dean of Women Students (Shift-II)
- Non -Teaching : Mr. A. Krishnamurthi,
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- Parents Representatives : Mr. S.Gangadharan
- Students Representatives : UG - A.Jabina, III B.Sc. Chemistry
D.Dhaneswar, III B.A. Defence
- : PG - C.Vimal, II M.Sc. Maths
S.Logeswari, II M.A. History

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- Dr. A. Duke John David (Boys Hostel Warden)
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- Dr. Y.Edison Nesa Doss (Convener, Shift-II)

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- Mr. C.Rajesh
- Mr. G.Thirupathi
- Mr. W.Augustin William
- Mr. L.Joseph Beski

(Shift-II)

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- Mr. Daniel Shankaran
- Mr. P.Joshuva Premkumar
- Mr. Amarnath

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- Dr. K.Kennedy
- Dr. B.Allen David Issaih
- Dr. K.Balaji
- Dr. A.Duke John David
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- Dr. S.Senthil Kumar
- Dr. M.Akilan

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Dr. D.Michael
Mr. Vinoth
Dr. D.Somasundaram
Dr. C.Jacob
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Mr. D.Abel Dhanashing
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Mr. A.Yakob
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Mr. Y.Arun Samraj
Mr. Babu

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Mr. A.Russell Premraj Benjamin (Vice-Principal, Shift-II)
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Dr. D.Anusuya
Mr. E.Roseline Gladis Siromani
Mr. B.Angelin Vijayakumari

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Dr.A.Nelsonvimalanathan (Convener)

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Ms. Sheela Jayakumari
Ms. R.Themangani
Ms. D.Sathiya
Mr. S.W.Noah Eastman
Mr. A.Suresh

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Dr. P.Swamy Doss
Mr. S.G.Samuel Collison
Ms. J.P.Evelyn Freeda
Ms. C.Joice Parimala

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Ms. G.Rekha
Mr. G.Inbanathan
Mr. S.Veeramani
Mr. Y.Arun Samraj
Mr. P.Baskaran
Mr. Andrew

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Dr. N.Anbu (Convener)

Shift-I

Ms. I. Epsy Devakirubai
Dr. D.Sathya Prasath Kumar
Dr. C.Dhayalan
Mr. R.Jousha Benjmain Devaraj
Mr. Selvaraj
Mr. J.Dhananjayan
Mr. Selvam

Shift-II

Mr. Stanley
Dr. A.Gnanavel
Mr. M.Amenraj
Mr. J.Jousha Raja Rathinam
Mr. P.Baskaran

Counselling Cell

Shift-I

Dr. P.Swamy Doss (Convener)
Mr. J.Altrin Jaya Prasath
Ms. V.Loganayagi
Dr. Christopher

Shift-II

Dr. I.Rufus Sathish Kumar (Convener)
Dr. Simon Philip
Ms. C.Thehila Lotus Spurgeon
Mr. Nathaniel Prabhu

Examination Committee

Mr. Y.David Naresh Benjmain-C.E.O
Ms. D.Dorothy Prema Kavitha
Dr. S.Hepcy Christian Mary
Dr. T.Dhayalan
Mr. S.Sathianathan Prasanna
Mr. S.Murugan
Ms. C.S.Sandhya Preethi Christina
Mr. Shafeeq Ahmed
Mr. Martin Paul Rufus Kumar
Dr. K.Udhaya Kumar
Mr. Madhan Raj

Women Cell

Shift-I

Ms. A.Kalpana (Convener)
Ms. S.E.Annie Jasmine
Dr. T.Parimala Shanthakumari
Dr. V.Manjula

Shift-II

Ms. J.P .Evelyn Freeda (Dean of Women Students, Shift-I)
Ms. V.Ruckmani
Dr. S.A.Nesamani Maragatham
Dr. M.Angeline Kavitha
Ms. B.Sudha

NAAC Committee

Dr. A.Nelsonvimalanathan (Chairman)
Dr. J.Annie Kamala Florence (Vice-Principal, Shift-I)
Mr. A.Russell Premraj Benjamin (Vice-Principal, Shift-II)
Dr. S.Caleb Nobel Chandar (Bursar)
Dr. D.Jai Kumar (Convener)
Dr. P.Anbalagan
Dr. R.Annie Vidhya
Mr. D.Thirumaran
Dr. K.Kishore
Dr. M.Job Gopinath
Dr. Binu Anitha Joseph

Fine Arts Committee

Shift-I

Dr. L.Francis Raj (Convener)
Dr. S.Rachel Abi Ranjani

Shift-II

Dr. Y.Immanuel Convener
Ms. C.Ruckmani
Ms. S.Booshanam Thabitha
Mr. Nathaniel Prabhu
Mr. Magesh Prabhu

Campus Maintenance Committee

Dr. A.Nelsonvimalanathan (Chairman)
Dr. J.Annie Kamala Florence (Vice-Principal, Shift-I)
Mr. A.Russell Premraj Benjamin (Vice-Principal, Shift-II)
Dr. S.Caleb Nobel Chandar (Bursar)
Dr. N.Nirmal Magadalenal (Convener)
Mr. A.Krishnamurthi-Superintendent
Mr. I.Simon
Ms. D.Rachel Ranjani
Ms. B.Soniya Mary
Mr. V.David Bakiyaraj
Ms. M.Karen Joana Paul
Dr. Jaya Sheela Prakash
Mr. Selvam
Mr. Sekar
Mr. Sathi
Mr. S.Ramaraj
Mr. K.Srinivasan

UNIVERSITY REGULATIONS

REQUIREMENTS FOR THE UNIVERSITY EXAMINATIONS

A candidate will be permitted to take the University Examination of any Semester, if

i. He / she secures not less than 75% of attendance out of the 90 Instructional days during the Semester. (In the case of married women students the minimum attendance requirement shall be 55% of the total Instructional days.

ii. He / she earns a Progress Certificate from the Head of the Institution of having satisfactorily completed the prescribed course of study in the subjects as required by these Regulations and his / her conduct has been satisfactory, provided that it shall be open to the Syndicate or any authority delegated with such powers by the Syndicate to grant exemption to a candidate who has failed to earn 75% of the attendance prescribed for any valid reason(s) subject to the usual conditions.

iii. A candidate who has secured attendance less than 75% but 65% and above, shall be permitted to take the Examination on the

recommendation of the Head of the Institution to condone the lack of attendance on payment of the prescribed fees to the University.

iv. A candidate who has secured attendance less than 65% but 55% and above in any Semester has to compensate the shortage of attendance in the subsequent Semester besides, earning the required percentage of attendance in that Semester and take the Examination of both the Semester papers together at the end of the later Semester.

v. A candidate who has secured less than 55% of attendance in any Semester will not be permitted to take the regular examinations and to continue the study in the subsequent Semester. He / she has to redo the course by rejoining the Semester in which the attendance is less than 55%.

vi. A candidate who has secured less than 65% of attendance in the final Semester has to compensate his/her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

REVALUATION AND RE-TOTALLING

Candidates who appeared for final Under Graduate Examination for the first time as regular candidates are eligible to apply for revaluation for any number of subjects in the final year provided they should not have any arrear subjects in the previous years examination at the time of applying for re-valuation. A Stipulated fee is prescribed.

Revaluation of answer papers for PG Examinations for any number of theory papers in the final year will be considered only for those candidates who have completed the study within the minimum period prescribed for the course provided they have passed all the subjects of the previous years irrespective of their attempts.

COLLEGE RULES

A. GENERAL DISCIPLINE

1. Students should at all times be neatly dressed and should practice courtesy to each other and to their lecturers.
2. Under no circumstance will students be allowed to borrow or lend pens, erasers, instruments, mathematical tables and so forth during college examinations.
3. Disobedience, copying or prompting in examinations and other moral delinquencies shall be severely dealt with.
4. When a lecturer enter the class room the students shall rise and remain standing until asked to sit or till the lecturer sits.
5. All students are requested to be in their seats before the bell rings.
6. No student shall leave the class room until the class is dismissed, but do so with the permission of the lecturer.
7. Students are not to deface or damage the building or furniture in any way; any damage done will be repaired by the College and the cost of the repair shall be recovered from the Student.

8. No student is allowed to attend or take part in any political meeting or in any gathering of any kind which is likely to result in disturbance of peace, expressions or actions of disloyalty to the Government.
9. Any student found to be indifferent to or careless in his work or whose conduct is considered to be detrimental to the best interests of the College may at any time be suspended or dismissed from the institution. In case of a dismissal, a record of such dismissal shall be kept and the fact of dismissal report will be sent to the parent or guardian and to the appropriate authority.
10. Smoking, consuming alcohol and using abusive language in the College premises are strictly prohibited.
11. The Government prohibits ragging. Any student caught in this act is liable for severe punishment including dismissal and Criminal proceeding.
12. Any student found willfully preventing other students attending classes or inciting a strike will be expelled from the college.

13. Students who come late may be admitted into the class at the discretion of the staff – in charge but they may not be given attendance.

14. Students should take up all the three Continuous class Internal Assessment Examinations (CIA) and should do all the Assignments given.

RAGGING

Ragging is totally banned under the orders of the Central and State Governments and the Thiruvalluvar University. There should be no ragging / orientation initiation of any sort in campus or outside. Students of the College who violate this directive will be severely dealt with. Punishment for such violation ranges from imprisonment up to a period of two years / fine up to Rs. 10,000/ or expulsion from College. Incidents of ragging or attempted ragging, whether in the College campus, in the hostel, or any where else should be reported to the Dean of Student Affair or to the Principal.

B. ATTENDANCE

1. Attendance will be marked at the beginning of each class hour.

2. Students shall assemble in their respective lecture rooms five minutes before the hour. They shall occupy the fixed places, assigned for them in the class, and shall answer with promptness when the attendance is taken.

3. Student who come after the attendance is taken shall report himself to the Staff – in charge at the close of the session.

4. No student should absent himself / herself from the College without previously obtaining leave, except in case of sudden illness or other circumstances which may prevent him / her from doing so.

5. Application for leave must state clearly the reasons and must be countersigned by parent / guardian or warden in case of residential students.

6. If a student absents himself / herself from the College without leave he / she shall pay a fine of Rs. 5/- for each day of absence.

7. No leave can be granted from examinations or tests except for reasons of grave necessity. In case of illness, a proper

medical certificate must be produced before the close of the examination.

8. If without leave, or under any false pretext a student be absent from any college examination, he shall be treated as having failed in the same.

C. EXAMINATION

1. If a student loses more than 25% of the total number of working days through absence without leave he / she will not be eligible to appear for the University Examination. In case where the absence has been for genuine reasons he / she may be permitted to apply to the University through the Principal for condonation, paying a condonation fee of Rs.1000/- provided the shortage of attendance does not exceed 12.5% and the Principal considers that the reasons given for failure to keep the prescribed attendance satisfactory.

2. If a student is detained in the I & II years due to shortage of attendance below 50%, he/she will be allowed to take I & II years Examination only after the completion of the III year courses or II year PG degree Courses as the case may be provided he / she puts in 40% attendance during the detention year, otherwise he / she will not be promoted to II / III.

D. PAYMENT OF FEES

1. The fee for each term shall be paid not later than the 5th working day of the term.

2. If a student fails to pay his / her fee on the day fixed for payment, a fine at the rate of Re.1/- per day shall be levied.

3. If the fee is not paid with in the end of the month, the student's name shall be struck off the rolls. If re-admitted he/she shall, in 'addition' to the fee and fine due from him/her, pay a re-admission fee of Rs. 5/- (M.E.R.99). In calculating the amount of fine due, all authorized holidays will be left out of account.

4. When a student's name is struck off the College rolls he forfeits his place in the hostel as well.

5. No one will be permitted to sit for any of the semester examinations without clearing the college fee arrears.

E. DEPARTMENTAL TOURS

Educational Tours may be organized by the Department either as a class or as a department. Maximum of one week will be permitted for a tour organized by the out-going (Men) students. One day tour is permitted and

the students should be accompanied by a minimum of two staff members, one of whom has to be a lady staff member, if the tour party consists of girls. PG students of both boys and girls are permitted for 5 days provided a lady staff accompany the tour along with a male staff member. Application for railway concession for the tour should be handed over to the Principal's Office through the Head of the Department at least three days before collecting the concession forms.

F. IDENTITY CARDS

The Student ID Card issued by the College is a document to be carried by the student at all times when in campus. It should be surrendered, on demand to any official of the institution. Copy of the ID card will not be accepted.

G. SCHOLARSHIPS

1. Full and half tuition fee under 92 TNER is available to students from the Backward Class, Most Backward Class, the Scheduled Class, the Scheduled Tribes and Adi-Dravida Christians. For full fee concession the income limit of parents is Rs. 50,000/- per annum. There is no income limit for MBC, SC & ST students and Adi-Dravida Christians. Special fee has to be paid in full.

RESIDENTIAL SCHOLARSHIP AND NON - RESIDENTIAL SCHOLARSHIP

Residential and Non-Residential Scholarships are also available for BC, MBC, SC, ST, ADC students.

SCHOLARSHIPS THROUGH THE DIRECTOR OF COLLEGIATE EDUCATION

1. National Merit Scholarships, Government of India Scheme
2. Merit cum National Loan Scholarship
3. State Scholarship to Children of school teachers.
4. Scholarships to the Children of Freedom Fighters
5. Adhoc Merit Grant Scheme :

An amount of Rs.300/- is sanctioned to students belonging to SC, ST and converted Christians studying in the Ist year of the Degree course after passing Higher Secondary Examination in the first attempt securing not less than 60% of marks in the aggregate.

COLLEGE ENDOWMENT SCHOLARSHIP

Out of the income from endowed money, the College awards scholarships to

deserving students on the basis of merit and need.

Grant of all scholarships and concessions is admissible to students only when sanction orders are issued by the appropriate authorities. The College is not responsible for the grant or non grant of government scholarships. All students are expected to pay their dues to the College until sanction orders are issued by the Government.

All money due to the College and Hostel will be recovered from the scholarship money at the time of disbursement of the same.

THE STUDENT AID FUND

The Fund which is sponsored and subsidized by the UGC and draws its income from an annual contribution made by the student body, intends to render financial assistance to poor students irrespective of caste or creed who are not in receipt of any other assistance to pay their tuition or examination fees or to purchase books or to meet similar expenses connected with their study in college. Applications will be invited during the course of the year from students who require assistance from the fund.

WORK SERVICE PROGRAMME

Under this programme poor and needy students will be assigned work in the office, library and other departments to assist existing staff. They will be paid a fixed amount for services rendered. Poor students who wish to benefit from this may apply to the Principal.

VOORHEES COLLEGE SPECIAL PRIZES AND AWARDS

Christian Students

1. The Roehlf Memorial Prize is awarded to the best Christian student studying Commerce.
2. Tmt. Pankajam Deverajan Memorial Prize awarded to the best Christian students of I.M.Sc.Zoology
3. Late. Mrs. & Mr.G.Williams Endowment scholarship awarded to Christian student of III B.A., History.
4. Former Principal Dr.R Jayakaran Isaac endowment scholarship to deserving Christian student of III B.Sc., Computer Science.
5. Late. Smt. A.M.Kannammal Sigamani (Rtd H.M) memorial prize for moar deserving Christian student of III B.A., Tamil.

6. Former Principal Dr.M.J.John Scholarships for deserving Christian students of each year of every department.
7. Special prize awarded for Religious Instruction I year, II year and III year UG Students.

DEPARTMENT OF TAMIL

8. Special prize of proficiency in Tamil literature is given to a student of III B.A., Tamil.
9. Dr.Malcolm S. Adiseshiah Prize for Proficiency in Tamil literature is given to a student of III B.A. Tamil.
10. The Dr.John H.Piet Prize is awarded to the best outstanding student in literary activities.

DEPARTMENT OF ENGLISH

11. Dr. Eric Rajadurai Prize for Proficiency in English Literature awarded to a student of III B.A.English.
12. Rev. L. Hekhius Memorial award instituted by Mr.P.Kuppu Roa (old student 1923 - 24) awarded to a student of III B.A., English.
13. Mr. L.Christian Everest Memorial prize instituted by the Department of English,

is awarded to a deserving student of IIB.A., English.

14. Prof. H. D. Stanely Endowment Scholarship instituted by the Department of English, is awarded to an outgoing English major student based on Performance in II year University Examination & Character.

15. Ubadesiyar Samuel Award to the Best outgoing Christian Students.

DEPARTMENT OF MATHEMATICS

16. Principal Savarirayan prize for proficiency in Mathematics awarded to a student of III B.Sc., Mathematics.
17. Principal M.J. John Prize is awarded to the most outstanding students of I M.Sc., Mathematics.
18. The Sri Radhakrishnan Prize is awarded to the most outstanding student of the I M.Sc.Mathematics.
19. The Sri Radhakrishnan Prize is awarded to the most outstanding student of the II M.Sc.Mathematics.
20. Dr.S.Athisaya Raj endowment scholarship awarded to outstanding student of I B.Sc., Mathematics.

21. Dr.S.Athisaya Raj endowment scholarship awarded to outstanding student of II M.Sc., Mathematics.
22. Late Prof. Rajkumar Gold medal awarded to the M.Sc., Mathematics student scored highest mark in Algebra
23. Late Prof. Rajkumar Gold medal awarded to the B.Sc., Mathematics student scored highest mark in Algebra
24. Late. Mrs. Samuel Prize for the UG student scores first mark in Numerical Methods.
25. Late. Mrs. Samuel Prize for the PG student, scores first mark in Discrete Mathematics.

DEPARTMENT OF PHYSICS

26. Principal Jesurathinam Prize for Proficiency in Physics is awarded to a III B.Sc.Physics Students.
27. ASA prize for best student of I B.Sc., Physics.
28. Prof. P.S. Hariharan memorial prize awarded to a III B.Sc., Physics Student.
29. Dr.K. Nesamony Endowment prize for the best outgoing student of M.Sc., Physics.

DEPARTMENT OF CHEMISTRY

30. Dr. Malcolm S. Adiseshiah prize for Proficiency in Chemistry awarded to a student of III B.Sc.Chemistry.
31. Shri. Masilamani Endowment fund awarded to a best student in III B.Sc., Chemistry.
32. Thirumathi. Saroja Annamalai award for the best chemistry brain in the final year of M.Sc., Chemistry.
33. Thiru. Annamalai Arumugam award for the best chemistry brain for the girl student of final year B.Sc., chemistry.

DEPARTMENT OF ZOOLOGY

34. Principal Jesurathinam Prize for Proficiency in zoology is awarded to a III B.Sc., Zoology Students.
35. Late.Smt.Lalitha W/o. Shri Ramaoorthy memorial prize awarded to the best outgoing UG student of Zoology.
36. Tmt. Pankajam Devarajan memorial prize for best women student of II M.Sc., Zoology.
37. Late.Smt.Lalitha W/o. Shri Ramaoorthy memorial prize awarded to the best outgoing PG student of Zoology.

38. Prof. Dr.D. Manley Nambikkairaj memorial endowment prize awarded for deserving outgoing PG student of Zoology

DEPARTMENT OF COMMERCE

39. Thiru. Sarangapani Memorial Prize for Proficiency in Commerce is awarded to a student of III year B.Com.,
40. Principal Dr.M.J. John Prize is awarded to the most outstanding student of I B.Com.,
41. Dr.K.Vaidyanatha Iyer Memorial Prize for Proficiency in Commerce optional subjects, is awarded to a UG student in commerce.
42. Dr. P. Arunachalam Memorial Prize for III B.Com., Student in the Evening College.
43. Dr. K. Viswanathan memorial prize to III B.Com Student
44. Late Mr. Saravana Kumar (II B.Com.,) Scholarship awarded to II B.Com., student.
45. Bharathi Press Thiruvengadasamy & Kuppuram Prize to II B.Com., student scoring the highest marks in Accountancy in I B.Com. University Examination.

46. ASA prize for best student in Commerce.
47. Dr.K.Vaidyanatha Iyer Memorial Prize for Proficiency in Commerce optional subjects, is awarded to PG student in commerce.

DEPARTMENT OF ECONOMICS

48. Thiru. Sarangapani Memorial Prize for Proficiency in Economics is awarded to III year student of B.A., Economics.
49. Dr. M.J. Sudarsanam Prize awarded to the best student of III B.A., Economics.
50. ASA prize for best student in Economics.

DEPARTMENT OF HISTORY

51. Dr. Malcom S. Adiseshiah prize for Proficiency in History awarded to student of III B.A., History.
52. Late Mrs. & Mr. G. Williams Endowment Scholarship to Non Christian student of III B.A., History

DEPARTMENT OF DEFENCE STUDIES

53. Thiru. Sarangapani Memorial Prize for Proficiency in Defence studies is

awarded to III year student of B.A., Defence.

DEPARTMENT OF COMPUTER SCIENCE

- 54. Former Principal Dr. R. Jayakaran Isaac endowment Scholarship to deserving Non - Christian student of III B.Sc., Computer Science.
- 55. Former Principal Dr. R. Jayakaran Isaac endowment Scholarship to deserving Christian student of III B.Sc., Computer Science

DEPARTMENT OF COMPUTER APPLICATIONS

- 56. Former Superintendent Mr. D. John Jawaharlal award for best outgoing Christian student

DEPARTMENT OF SOCIAL WORK

- 57. Dr.Bennet Benjamin Gold medal awarded for the best outgoing student of II M.S.W.

DEPARTMENT OF BUSINESS ADMINISTRATION

- 58. Special prize for proficiency awarded to III B.B.A., student.

DEPARTMENT OF BOTANY

- 59. Prof. D.Manoj Chelladurai, former Vice Principal prize for proficiency in Plant Sciences and Bio-Technology is awarded to Two Students of final year.

SPORTS AND NCC

- 60. Prof. Ronald Rajendra Singh memorial Scholarship for the outgoing student in the field of sports preferably in Ball Badminton.
- 61. Dr.A.N.Gopal prize awarded to the best sportsman
- 62. Major Dr. Alpheus Benjamin Former HOD of Physics Endowment prize to best NCC cadets (RDC Cadets).

DIFFERENTLY ABLED STUDENTS

- 63. Mr.V.E. Venkatramani memorial prize for differently abled challenged Students.

GENERAL

- 64. Mr. A. Gunaseelan Endowment prize instituted by (former Reader in Commerce Dr.John Gunaseelan) awarded to non teaching staff children.
- 65. Former Principal Dr.R.Jayakaran Isaac

endowment scholarship awarded to son/daughter of non-teaching staff.

66. Late Smt. Kannammal Sigamani (Rtd H.M.) Memorial Prize awarded to the most deserving student from Chittoor (A.P.)
67. Mr.C.V.Ramamoorthy scholarship awarded to a deserving student in any degree class.
68. Late. I.B. Rajendran memorial prize awarded to a student for extra curricular activities.
69. Mrs. S. Annammal Samuel Award to the best outgoing girl student.
70. The Adiseshiah Memorial Gold Medal for Proficiency in English is awarded to the III year student of BA & B.Sc., on the basis of marks obtained in English in the University Examination of the previous years.
71. Special prize awarded in Moral Instruction for the best students in each year of all the UG courses.
72. Dr.M.J. John Scholarship for the very poor students for all UG & PG classes
73. VANZANTA WOOD prize awarded to the best all rounder in the college.

STUDENT FACILITIES THE CHAPEL

To enable students and staff to begin each day with devotion and blessings, a short service of worship will be held at 8.45 a.m. at the Chapel on every College working day. All shift - I students are invited to attend this worship.

The shift - II students and staff will have short devotion at the Chapel on every working day by 1.30 pm. All shift - II students are welcome to attend.

CANTEEN

A Canteen serving food, snacks and refreshments is located inside the College premises. This will remain open throughout the day from 8.30 a.m. to 5.30 p.m.

WOMEN'S REST ROOM

A spacious Rest Room for the use of women staff and women students are provided in the campus. A quarantine is also attached with it.

RECORDS OFFICE

All records of students will be maintained and kept at the Vice-Principal's Office.

PARKING FACILITIES

1. All vehicles must be parked in the places allotted for the purpose.
2. Motorized vehicles of students should be parked only at the place near the main gate.
3. No vehicle belonging to the outsiders other than the visitors to the College should be parked inside the campus.
4. No vehicle belonging to the outsiders will be allowed to enter the campus without permission.
5. Residential students are not permitted to have motorized vehicles.

SPORTS & GAMES

The College playground is situated in the De Boer Campus which is about 2 km. from the College. In addition, facilities to play Basket Ball, Volley Ball, Cricket, Indoor Games like Table Tennis, Carom and Chess and a Gymnasium are also available for students in the college campus.

FIRST-AID ROOM

First-aid Facility is available for students and staffs on all working days.

COLLEGE HOSTEL

The Hostel provides accommodation

for about one hundred students both men and women. Only a limited number of women students (around Twenty five) can be accommodated at present. Those who do not live with their parents or relatives are accepted to reside in the hostel or in rooms approved by the College authorities.

After securing admission in the College, separate application must be made for admission into the hostel (Forms are available with the Hostel Warden).

The Warden shall be responsible for the strict enforcement of the rules and by-laws and for the conduct of the inmates. Each year a Managing Committee of 5 students is elected for the Internal Management. Any student whose name is on the rolls of the College is eligible for admission.

No one who ceased to be a student of the College shall retain the privileges of membership. Expulsion from the Hostel for a serious offence shall involve expulsion from the College also. No member may absent himself from the hostel for any night without obtaining previous permission of the Warden.

The members shall not receive visitors (other than guests, parents or guardians) except in the evening from 4.30 p.m. to 7.00 p.m.

No one shall be found loitering in the Hostel premises during college hours.

The mess is run by 'Dividing System'. The estimated mess rate per month is Rs.1500/- All scholarship holders must pay mess charges regularly up to the end of the I term as the scholarship amount will not cover board charges in full.

Study time commences at 7.00 p.m. in the Hostel. Roll call will be taken at 9.30 p.m. Rooms must be kept open during this period.

Electricity and water charges will be borne by the residents.

THE LIBRARY

The Library contains approximately one lakh volumes at present and substantial additions are made every year. There are also a good number of journals and magazines. The Library is open to all members of the College.

Digital Library and Smart Class are new additions to facilitate e-learning facilities for the students of the college.

LIBRARY RULES

The Library is open on all working days from 8.30 a.m. to 5.00 p.m. The Library will remain closed on Sundays and National holidays.

Books are lent on production of tokens. Students will be given token as follows:

Undergraduate students 2 tokens

Postgraduate students 4 tokens

Each token entitles the holder to borrow one book. The token is not transferable and books cannot be borrowed on behalf of others. If a token is lost, mutilated, or defaced, it will be replaced at a cost of Rs.10/- students will have to surrender their tokens at the close of each academic year.

Books borrowed may be retained for 4 days. A fine of Re.1/- will be imposed for each day a book is over due. Reference books cannot be taken out.

Students may read magazines, periodicals and newspapers in leisure periods but are not allowed to take them outside the library.

Any kind of marking, clipping or highlighting of book is absolutely forbidden. Readers shall be held responsible for damage done by them and shall be required to replace such books or pay the value thereof. Silence shall be observed at all times in the Library.

RULES FOR STAFF

Members of the Faculty are privileged to borrow up to 5 books at a time and the

FINE ARTS CLUB

The Fine Arts Club was started in the year 2013 to identify and develop the talent and skill in the students and are encouraged to participate in the college programmes and inter collegiate competitions. Dr. L.Francis Raj is the convener of the club.

ECO CLUB

The Eco Club was established in the year 2014 in order maintain the college campus and the Hostel Premises clean and tidy. The Eco Club imparts knowledge, participation and training to the students with regard to cleanliness, environmental protection and conservation. Dr. N.Nirmal Magadalenal & J.Altrin Jaya Prasath is the convener of the club.

EXTRA CURRICULAR ACTIVITIES

NATIONAL CADET CORPS (NCC)

The NCC which has lofty aims and ideals provides training in drill, weapon training, map reading etc. The Voorhees College Unit has four platoons of the infantry division. The officer of the NCC is Dr. C.Gnanlin Shiny, Asst.Professor of Commerce.

NATIONAL SERVICE SCHEME (NSS)

There are three units in the College. Nearly 300 volunteers are enrolled in a year. Each unit is divided into various groups. The Programme Officers assisted by a group of leaders, conduct NSS Programmes at Voorhees College effectively. The Programme Officers of NSS units are Dr. A. Nelson Vimalanathan (Dept. of Commerce) Dr.S.Caleb Noble Chandar (Dept. of Chemistry) and Dr. Hepcy Christina Mary (Dept. of Zoology).

RED RIBBON CLUB

In order to provide awareness on HIV / AIDS the Red Ribbon Club project is organised. Dr. D.Sathya Prasath Kumar (Shift-I) is the Programme officer of the Club.

WOMEN'S CELL

This Cell has started functioning in Voorhees College since 2000. Women students are members of the Cell. The Cell has been organizing seminars, meetings on woman empowerment, self-employment, counseling, women's rights etc. Ms.J.P.Evelyn Freeda (Dept. of Commerce) in the (Shift - II).

YOUTH RED CROSS

The Youth Red Cross (YRC) is formed to create an awareness of one's duty and to inculcate the spirit of service in the minds of youth. YRC has been functioning since 2011. The programme officers are Dr. S. Sendhilkumar (Shift - I) and Ms. V. Ruckmani (Shift - II).

STUDENT'S COUNSELLING UNIT

Students Counseling Unit is formed as per the norms of the Government of Tamilnadu. This unit helps the student community to tide over Educational and psychological problems. The convener of this counseling unit and the co-ordinators of this unit are Dr. Nelson Vimalanathan, Ms. A. Kalpana, Dr. Simon Philip & Ms. C. Thehila Lotus Spurgeon.

PARENT-TEACHERS ASSOCIATION / STAFF COUNSELING

Parent-Teachers Association & Staff Counseling Cell are new Associations added in the Academic Year 2011-2012. Parent Teachers Association is established to bring Parents and Teachers of College together to

understand and solve the problems faced by them in the realm of Education and Development of Personality of the Students. The Staff Counseling Cell is established to solve staff problems and to foster Staff Welfare. Dr. A. Nelson Vimalanathan is the Convenor of these Associations.

STUDENT CHRISTIAN MOVEMENT (SCM)

The Membership of this organization is open to all Christian students of the College. Its purpose is to facilitate the spiritual, intellectual and physical development of the students. Organizing prayer, conducting special meetings like White Christmas, Shalom, student's retreat are the main activities of the organization.

These programmes add great value to the students and it is hoped that their influence will be felt in all phases of college life. The Staff in-charge are Dr. M. Paul Dinakaran (Shift - I) and Mr. S. Prasanna Nithiya Sudhan (Shift - II).

THE VOORHEES COLLEGE ALUMNI ASSOCIATION

The Alumni Association was first formed in April 1915. In the year 2003 the Association was revived and new office bearers of the Association were elected at the general body meeting of the Association.

The office bearers are :

| | | |
|-----------------|---|--|
| President | : | Thiru. G.Viswanathan Chancellor, VIT, Vellore. |
| Secretary | : | Thiru. A.S.A.Shanmugam ASA Bakery Vellore. |
| Vice-Presidents | : | Thiru. A.Maninathan Secretary, DKM College, Vlr. Thiru. M.S.Narasimhan Advocate, Vellore. |
| Treasurer | : | Dr. S.Caleb Noble Chandar Bursar. |
| Alumni Officer | : | Mr. M.Amen Raj HOD, Dept.of Computer Application |

The main aim of the Alumni Association is to help the students to maintain link with their Alma Mater. Therefore when a student leaves the College, he / she is invited to become an active life member of the Association.

VOCATIONAL GUIDANCE CENTRE

Vocational Guidance Centre is formed as per the norms of the Government. Periodical lectures are given to students with the aid of experts is the Placement Officer

BLOOD DONOR'S CLUB

Students are encouraged to donate blood to save the life of many needy patients. Dr.I.Prince Jayadoss Isaac (Shift-I) & Mr.Y.Arunsamraj (Shift-II) manages and coordinates the club activities

CONSUMER CLUB

Awareness on consumerism and consumer redressal are provided through this Club. Dr. V.P.Prince Prabakaran heads the club activities.

ROTARACT CLUB

Rotaract Club aims to inculcate Leadership Skills and to motivate students to do Community service. Mr.B.Nirmal Prasanna (Shift- I) and Mr.Andrew (Shift - II) Ms.J.Christina Yakkal Sarojini (Women Students) for both Shifts are the rotaract Co-ordinators.

ANTI - HARASSMENT COMMITTEE

The Anti-Harassment Committee is constituted to prevent and to enquire in to the issues and complaints of harassment of women students and women staff members.

The following are the members of the committee

1. **Dr. A.Nelsonvimalanathan**
Chairman
2. **Dr. J.Annie Kamala Florence**
Vice-Principal (Shift-I)
3. **Prof. A.Russell Premraj Benjamin**
Vice-Principal (Shift-II)
4. **Dr. S.Caleb Noble Chandar**
Bursar
5. **Dr. D.Anusuya**
6. **Ms. E.Roseline Gladis Siromani**
7. **Ms. Praveena**
8. **Ms. C.Ruckmani Theodore**
9. **Ms. M.Jayasudha**
10. **Ms. Hepzibha Gnana Synthiya**

CENTRE FOR EXTENSION ACTIVITIES

The Centre for Extension Activities has been established in this academic year to foster extension programmes for the benefit of students and to the society at large.

The following are the members of the committee

1. **Dr. A.Nelsonvimalanathan**
Chairman
2. **Dr. J.Annie Kamala Florence**
Vice-Principal (Shift-I)
3. **Prof. A.Russell Premraj Benjamin**
Vice-Principal (Shift-II)
4. **Dr. S.Caleb Noble Chandar**
Bursar
5. **Dr. T.Parimala Shantha Kumari**
6. **Dr. Y.Edison Nesadoss**
7. **Dr. B.S.Selvakumar**

ACADEMIC CALENDAR 2019-2020

| Date | Day | JUNE 2019 | D.O | W.D |
|------|-----|-----------|-----|-----|
| 1 | Sat | | | |
| 2 | Sun | | | |
| 3 | Mon | | | |
| 4 | Tue | | | |
| 5 | Wed | | | |
| 6 | Thu | | | |
| 7 | Fri | | | |
| 8 | Sat | | | |
| 9 | Sun | | | |
| 10 | Mon | | | |
| 11 | Tue | | | |
| 12 | Wed | | | |
| 13 | Thu | | | |
| 14 | Fri | | | |
| 15 | Sat | | | |
| 16 | Sun | | | |
| 17 | Mon | | I | 1 |
| 18 | Tue | | II | 2 |
| 19 | Wed | | III | 3 |
| 20 | Thu | | IV | 4 |
| 21 | Fri | | V | 5 |
| 22 | Sat | | - | - |
| 23 | Sun | | - | - |
| 24 | Mon | | VI | 6 |
| 25 | Tue | | I | 7 |
| 26 | Wed | | II | 8 |
| 27 | Thu | | III | 9 |
| 28 | Fri | | IV | 10 |
| 29 | Sat | | | |
| 30 | Sun | | | |
| | | | | |

Our Character is only as strong as our Behaviour

| Date | Day | JULY 2019 | D.O | W.D |
|------|-----|--------------|-----|-----|
| 1 | Mon | | V | 11 |
| 2 | Tue | | VI | 12 |
| 3 | Wed | | I | 13 |
| 4 | Thu | | II | 14 |
| 5 | Fri | | III | 15 |
| 6 | Sat | | - | - |
| 7 | Sun | | - | - |
| 8 | Mon | | IV | 16 |
| 9 | Tue | | V | 17 |
| 10 | Wed | | VI | 18 |
| 11 | Thu | | I | 19 |
| 12 | Fri | | II | 20 |
| 13 | Sat | | - | - |
| 14 | Sun | | - | - |
| 15 | Mon | | III | 21 |
| 16 | Tue | | IV | 22 |
| 17 | Wed | | V | 23 |
| 18 | Thu | | VI | 24 |
| 19 | Fri | | I | 25 |
| 20 | Sat | | - | - |
| 21 | Sun | | - | - |
| 22 | Mon | | II | 26 |
| 23 | Tue | | III | 27 |
| 24 | Wed | CIA-I Begins | IV | 28 |
| 25 | Thu | | V | 29 |
| 26 | Fri | | VI | 30 |
| 27 | Sat | | - | - |
| 28 | Sun | | - | - |
| 29 | Mon | | I | 31 |
| 30 | Tue | | II | 32 |
| 31 | Wed | | III | 33 |

Don't go through life, grow through life

| Date | Day | AUGUST 2019 | D.O | W.D |
|------|-----|---|-----|-----|
| 1 | Thu | Commencement of M.Phil Classes | IV | 34 |
| 2 | Fri | | V | 35 |
| 3 | Sat | | - | - |
| 4 | Sun | | - | - |
| 5 | Mon | Uploading the of I-CIA Intermarks in the university Exam. Portal | VI | 36 |
| 6 | Tue | | I | 37 |
| 7 | Wed | | II | 38 |
| 8 | Thu | | III | 39 |
| 9 | Fri | | IV | 40 |
| 10 | Sat | | - | - |
| 11 | Sun | | - | - |
| 12 | Mon | Bakrid | - | - |
| 13 | Tue | | V | 41 |
| 14 | Wed | | VI | 42 |
| 15 | Thu | Independence Day | - | - |
| 16 | Fri | Mission Festival 2019 | I | 43 |
| 17 | Sat | Mission Festival 2019 | - | - |
| 18 | Sun | | - | - |
| 19 | Mon | | II | 44 |
| 20 | Tue | | III | 45 |
| 21 | Wed | | IV | 46 |
| 22 | Thu | | V | 47 |
| 23 | Fri | Krishna Jayanthi | - | - |
| 24 | Sat | | - | - |
| 25 | Sun | | - | - |
| 26 | Mon | | VI | 48 |
| 27 | Tue | | I | 49 |
| 28 | Wed | | II | 50 |
| 29 | Thu | | III | 51 |
| 30 | Fri | | IV | 52 |
| 31 | Sat | | - | - |

Great achievements requires great perseverance

| Date | Day | SEPTEMBER 2019 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Sun | | - | - |
| 2 | Mon | Vinayakar Chathurthi | - | - |
| 3 | Tue | II-CIA Examination | V | 53 |
| 4 | Wed | II-CIA Examination | VI | 54 |
| 5 | Thu | II-CIA Examination | I | 55 |
| 6 | Fri | II-CIA Examination | II | 56 |
| 7 | Sat | - | - | - |
| 8 | Sun | - | - | - |
| 9 | Mon | II-CIA Examination | III | 57 |
| 10 | Tue | Muharram | - | - |
| 11 | Wed | II-CIA Examination | IV | 58 |
| 12 | Thu | | V | 59 |
| 13 | Fri | Last Date For Payment of | VI | 60 |
| 14 | Sat | University Exam Fees without Fine | - | - |
| 15 | Sun | | - | - |
| 16 | Mon | Last Date For Payment of University Exam Fees with Fine \ Uploading of CIA-II | I | 61 |
| 17 | Tue | Internal in the University Examination Portal | II | 62 |
| 18 | Wed | | III | 63 |
| 19 | Thu | | IV | 64 |
| 20 | Fri | | V | 65 |
| 21 | Sat | | - | - |
| 22 | Sun | | - | - |
| 23 | Mon | | VI | 66 |
| 24 | Tue | | I | 67 |
| 25 | Wed | | II | 68 |
| 26 | Thu | | III | 69 |
| 27 | Fri | | IV | 70 |
| 28 | Sat | | V | 71 |
| 29 | Sun | | - | - |
| 30 | Mon | | VI | 72 |

One sin becomes two when it is defended

| Date | Day | OCTOBER 2019 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Tue | | I | 73 |
| 2 | Wed | Gandhi Jayanthi | - | - |
| 3 | Thu | | II | 74 |
| 4 | Fri | | III | 75 |
| 5 | Sat | | - | - |
| 6 | Sun | | - | - |
| 7 | Mon | Ayutha Pooja | - | - |
| 8 | Tue | Vijayadhasami | - | - |
| 9 | Wed | | IV | 76 |
| 10 | Thu | | V | 77 |
| 11 | Fri | | VI | 78 |
| 12 | Sat | | - | - |
| 13 | Sun | Commencement of University Practical Exam for Odd Semester B.Sc(CS/BCA/MSW) | - | - |
| 14 | Mon | | I | 79 |
| 15 | Tue | CIA-III Exam | II | 80 |
| 16 | Wed | CIA-III Exam | III | 81 |
| 17 | Thu | CIA-III Exam | IV | 82 |
| 18 | Fri | CIA-III Exam | V | 83 |
| 19 | Sat | - | - | - |
| 20 | Sun | - | - | - |
| 21 | Mon | CIA-III Exam | VI | 84 |
| 22 | Tue | CIA-III Exam | I | 85 |
| 23 | Wed | | II | 86 |
| 24 | Thu | | III | 87 |
| 25 | Fri | | IV | 88 |
| 26 | Sat | | - | - |
| 27 | Sun | Deepavali | - | - |
| 28 | Mon | | V | 89 |
| 29 | Tue | | VI | 90 |
| 30 | Wed | | I | 91 |
| 31 | Thu | | II | 92 |

Hard work brings prosperity; playing around brings poverty

| Date | Day | NOVEMBER 2019 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Fri | Twin Vacation Begins | - | |
| 2 | Sat | All Souls Day | | |
| 3 | Sun | | | |
| 4 | Mon | Commencement of Odd Semester University Examination | | |
| 5 | Tue | | | |
| 6 | Wed | | | |
| 7 | Thu | | | |
| 8 | Fri | | | |
| 9 | Sat | | | |
| 10 | Sun | | | |
| 11 | Mon | | | |
| 12 | Tue | | | |
| 13 | Wed | | | |
| 14 | Thu | | | |
| 15 | Fri | | | |
| 16 | Sat | | | |
| 17 | Sun | | | |
| 18 | Mon | | | |
| 19 | Tue | | | |
| 20 | Wed | | | |
| 21 | Thu | | | |
| 22 | Fri | | | |
| 23 | Sat | | | |
| 24 | Sun | | | |
| 25 | Mon | Even Semester Begins | I | 1 |
| 26 | Tue | | II | 2 |
| 27 | Wed | | III | 3 |
| 28 | Thu | | IV | 4 |
| 29 | Fri | | V | 5 |
| 30 | Sat | | VI | 6 |
| | | | | |

When trouble overtakes you, let God overtake you

| Date | Day | DECEMBER 2019 | D.O | W.D |
|------|-----|-------------------------------|-----|-----|
| 1 | Sun | | - | - |
| 2 | Mon | | I | 7 |
| 3 | Tue | | II | 8 |
| 4 | Wed | | III | 9 |
| 5 | Thu | | IV | 10 |
| 6 | Fri | | V | 11 |
| 7 | Sat | | - | - |
| 8 | Sun | | - | - |
| 9 | Mon | | VI | 12 |
| 10 | Tue | | I | 13 |
| 11 | Wed | | II | 14 |
| 12 | Thu | | III | 15 |
| 13 | Fri | | IV | 16 |
| 14 | Sat | | - | - |
| 15 | Sun | | - | - |
| 16 | Mon | | V | 17 |
| 17 | Tue | | VI | 18 |
| 18 | Wed | Commencement of M.Phil Degree | I | 19 |
| 19 | Thu | Theory Examination | II | 20 |
| 20 | Fri | Staff Christmas Cheer | III | 21 |
| 21 | Sat | | - | - |
| 22 | Sun | Christmas Holidays Begins | - | - |
| 23 | Mon | | - | - |
| 24 | Tue | | - | - |
| 25 | Wed | | - | - |
| 26 | Thu | Publication of Odd Semester | - | - |
| 27 | Fri | University Exam Result | - | - |
| 28 | Sat | | - | - |
| 29 | Sun | | - | - |
| 30 | Mon | | - | - |
| 31 | Tue | | - | - |

The future depends on what we do in the present

| Date | Day | JANUARY 2020 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Wed | New Year | - | - |
| 2 | Thu | | - | - |
| 3 | Fri | College Begins | IV | 22 |
| 4 | Sat | Staff Retreat | - | - |
| 5 | Sun | | - | - |
| 6 | Mon | | V | 23 |
| 7 | Tue | I-CIA Examination | VI | 24 |
| 8 | Wed | I-CIA Examination | I | 25 |
| 9 | Thu | I-CIA Examination | II | 26 |
| 10 | Fri | I-CIA Examination | III | 27 |
| 11 | Sat | - | - | - |
| 12 | Sun | - | - | - |
| 13 | Mon | I-CIA Examination | IV | 28 |
| 14 | Tue | I-CIA Examination | V | 29 |
| 15 | Wed | Pongal | - | - |
| 16 | Thu | Thiruvallur Day | - | - |
| 17 | Fri | Uzhavar Thirunaal | - | - |
| 18 | Sat | - | - | - |
| 19 | Sun | - | - | - |
| 20 | Mon | | VI | 30 |
| 21 | Tue | | I | 31 |
| 22 | Wed | | II | 32 |
| 23 | Thu | Uploading of CIA-I Internal Marks in the University Exam Portal | III | 33 |
| 24 | Fri | | IV | 34 |
| 25 | Sat | | V | 35 |
| 26 | Sun | Diocesan Day / Republic Day | - | - |
| 27 | Mon | | VI | 36 |
| 28 | Tue | | I | 37 |
| 29 | Wed | | II | 38 |
| 30 | Thu | | III | 39 |
| 31 | Fri | | IV | 40 |

Little discipline multiply rewards

| Date | Day | FEBRUARY 2020 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Sat | | V | 41 |
| 2 | Sun | | - | - |
| 3 | Mon | | VI | 42 |
| 4 | Tue | | I | 43 |
| 5 | Wed | | II | 44 |
| 6 | Thu | | III | 45 |
| 7 | Fri | | IV | 46 |
| 8 | Sat | | - | - |
| 9 | Sun | | - | - |
| 10 | Mon | Last for Payment of UG/PG | V | 47 |
| 11 | Tue | University Examination Fees Without Fine | VI | 48 |
| 12 | Wed | | I | 49 |
| 13 | Thu | | II | 50 |
| 14 | Fri | Last for Payment of UG/PG | III | 51 |
| 15 | Sat | University Examination Fees With Fine | IV | 52 |
| 16 | Sun | | - | - |
| 17 | Mon | II-CIA Examination | V | 53 |
| 18 | Tue | II-CIA Examination | VI | 54 |
| 19 | Wed | II-CIA Examination | I | 55 |
| 20 | Thu | II-CIA Examination | II | 56 |
| 21 | Fri | II-CIA Examination | III | 57 |
| 22 | Sat | II-CIA Examination | IV | 58 |
| 23 | Sun | | - | - |
| 24 | Mon | | V | 59 |
| 25 | Tue | | VI | 60 |
| 26 | Wed | Last date for Uploading of CIA-II Internal | I | 61 |
| 27 | Thu | Marks in the University Examination Portal | II | 62 |
| 28 | Fri | / ASH Wednesday | III | 63 |
| 29 | Sat | | IV | 64 |
| | | | | |

The roots of education are bitter, but the fruit is sweet

| Date | Day | MARCH 2020 | D.O | W.D |
|------|-----|---------------------------------|-----|-----|
| 1 | Sun | | - | - |
| 2 | Mon | | V | 65 |
| 3 | Tue | | VI | 66 |
| 4 | Wed | | I | 67 |
| 5 | Thu | | II | 68 |
| 6 | Fri | | III | 69 |
| 7 | Sat | | IV | 70 |
| 8 | Sun | | - | - |
| 9 | Mon | | V | 71 |
| 10 | Tue | | VI | 72 |
| 11 | Wed | | I | 73 |
| 12 | Thu | Last of Even Semester Practical | II | 74 |
| 13 | Fri | Examination by the University | III | 75 |
| 14 | Sat | | - | - |
| 15 | Sun | | - | - |
| 16 | Mon | | IV | 76 |
| 17 | Tue | | V | 77 |
| 18 | Wed | | VI | 78 |
| 19 | Thu | | I | 79 |
| 20 | Fri | | II | 80 |
| 21 | Sat | III-CIA Examination | III | 81 |
| 22 | Sun | | - | - |
| 23 | Mon | III-CIA Examination | IV | 82 |
| 24 | Tue | III-CIA Examination | V | 83 |
| 25 | Wed | Ugadi - Telugu New Year | - | - |
| 26 | Thu | III-CIA Examination | VI | 84 |
| 27 | Fri | III-CIA Examination | I | 85 |
| 28 | Sat | III-CIA Examination | II | 86 |
| 29 | Sun | | - | - |
| 30 | Mon | | III | 87 |
| 31 | Tue | | IV | 88 |

A good leader is a good servant

| Date | Day | APRIL 2020 | D.O | W.D |
|------|-----|--|-----|-----|
| 1 | Wed | Last Date for Uploading of CIA-III | V | 89 |
| 2 | Thu | Internal Marks in the University Exam Portal | VI | 90 |
| 3 | Fri | | I | 91 |
| 4 | Sat | | II | 92 |
| 5 | Sun | Holy Week | - | |
| 6 | Mon | Mahaveer Jayanthi | - | |
| 7 | Tue | Commencement of Even Semester | - | |
| 8 | Wed | University Examination | - | |
| 9 | Thu | | - | |
| 10 | Fri | Good Friday | - | |
| 11 | Sat | | - | |
| 12 | Sun | Easter | - | |
| 13 | Mon | | - | |
| 14 | Tue | Tamil New Year | - | |
| 15 | Wed | | - | |
| 16 | Thu | | - | |
| 17 | Fri | | - | |
| 18 | Sat | | - | |
| 19 | Sun | | - | |
| 20 | Mon | | - | |
| 21 | Tue | | - | |
| 22 | Wed | | - | |
| 23 | Thu | | - | |
| 24 | Fri | | - | |
| 25 | Sat | | - | |
| 26 | Sun | | - | |
| 27 | Mon | | - | |
| 28 | Tue | | - | |
| 29 | Wed | | - | |
| 30 | Thu | | - | |

A good example preaches a powerful sermon

Semester I / III / V

| Period Day Order | 1 | 2 | 3 | Break | | | | 4 | 5 | 6 |
|---------------------|---|---|---|-------|--|--|--|---|---|---|
| I | | | | | | | | | | |
| II | | | | | | | | | | |
| III | | | | | | | | | | |
| IV | | | | | | | | | | |
| V | | | | | | | | | | |
| VI | | | | | | | | | | |

CIA / UNIVERSITY EXAM RECORD

[illegible]

| Name | Phone Number |
|------|--------------|
| | |

Memo



*The noble vision, loving heart and selfless toil
of the then missionaries, benefactors and
staff have made it possible to be a witness of God,
surpassing more than a hundred years of history
in educational mission and thriving as a banyan tree.*

*Voorhees College thanks God for
this wonderful blessings,*

IN VAIN WITHOUT GOD.

THIRUVALLUVAR UNIVERSITY
BACHELOR OF ARTS
DEGREE COURSE
B . A . TAMIL
CBCS PATTERN

(With effect from 2017 – 2018)

The Course of Study and the Scheme of Examination

| S. No. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|---------------------|---------|----------------|--------|--|---------------|----------|-------|
| | | Course Title | | | | | CIA | Uni.Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | தமிழ்/பிறமொழிகள் | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | ஆங்கிலம் | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 5 | 3 | இக்கால இலக்கியம் (கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை) | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper-2 | 4 | 3 | இலக்கணம் - 1 நன்னூல் (எழுத்ததிகாரம்) | 25 | 75 | 100 |
| 5 | III | ALLIED – 1 | Paper-1 | 7 | 4 | தமிழக வரலாறும் பண்பாடும் | 25 | 75 | 100 |
| 6 | IV | Environment Studies | | 2 | 2 | சுற்றுச் சூழல் பிரிவுகள் | 25 | 75 | 100 |
| TOTAL | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | தமிழ்/பிறமொழிகள் | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | ஆங்கிலம் | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-3 | 5 | 3 | இக்கால இலக்கியம் (கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை) | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-4 | 4 | 3 | இலக்கணம் - 2 நன்னூல் (சொல்லதிகாரம்) | 25 | 75 | 100 |
| 11 | III | ALLIED – 1 | Paper-2 | 7 | 6 | தமிழக வரலாறும் பண்பாடும் | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | மதிப்புக் கல்வி | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| TOTAL | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |

| S. No. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------|----------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | I | Language | Paper-3 | 6 | 4 | தமிழ்/பிறமொழிகள் | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | ஆங்கிலம் | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-5 | 3 | 3 | இலக்கியம் 3 சமயப்பாடல்களும் சிற்றிலக்கியங்களும் | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-6 | 3 | 3 | இலக்கணம் - 3யாப்பருங்கலக்காரிகை | 25 | 75 | 100 |
| 18 | III | ALLIED – 2 | Paper-3 | 7 | 4 | தமிழ் இலக்கிய வரலாறு - 1 | 25 | 75 | 100 |
| 19 | IV | Skill based Subject | Paper-1 | 3 | 3 | பயன்பாட்டுத் தமிழ் | 25 | 75 | 100 |
| 20 | IV | Non-major elective | Paper-1 | 2 | 2 | தமிழ்மொழி – அடிப்படை இலக்கணம் | 25 | 75 | 100 |
| TOTAL | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 21 | I | Language | Paper-4 | 6 | 4 | தமிழ்/பிறமொழிகள் | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | ஆங்கிலம் | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-7 | 3 | 3 | இலக்கியம் 4 காப்பியங்கள் | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper-8 | 3 | 3 | இலக்கணம் - 4தண்டியலங்காரம் (பொருளணியியல் மட்டும்) | 25 | 75 | 100 |
| 25 | III | ALLIED – 2 | Paper-4 | 7 | 6 | தமிழ் இலக்கிய வரலாறு - 2 | 25 | 75 | 100 |
| 26 | IV | Skill based Subject | Paper-2 | 3 | 3 | படைப்பிலக்கியமும் மொழிபெயர்ப்பும் | 25 | 75 | 100 |
| 27 | IV | Non-major elective | Paper-2 | 2 | 2 | இணையம் | 25 | 75 | 100 |
| TOTAL | | | | 30 | 25 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 28 | III | Core Theory | Paper-9 | 5 | 5 | சங்க இலக்கியம் (அகம்) | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-10 | 6 | 5 | இலக்கணம் 5 (அகம்) | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper-11 | 6 | 4 | தமிழ்மொழி வரலாறு | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper-12 | 6 | 4 | இலக்கியத் திறனாய்வு | 25 | 75 | 100 |
| 32 | III | Elective | Paper-1 | 4 | 3 | (கீழ்க்கண்ட மூன்றில் ஏதேனும் ஒன்றைத் தெரிவுசெய்துகொள்ளலாம்) அ. தகவல் தொழில்நுட்பம் ஆ. நாட்டுப்புறவியல் இ. விளம்பரக்கலை | 25 | 75 | 100 |
| 33 | IV | Skill based Subject | Paper-3 | 3 | 3 | கல்வெட்டியல் | 25 | 75 | 100 |
| TOTAL | | | | 30 | 24 | | 150 | 450 | 600 |

| S. No. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|----------------------|----------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER VI | | | | | | | | | |
| 34 | III | Core Theory | Paper-13 | 5 | 5 | சங்க இலக்கியம் (புறம்) | 25 | 75 | 100 |
| 35 | III | Core Theory | Paper-14 | 6 | 5 | இலக்கணம் 6 (புறம்) | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper-15 | 6 | 5 | திராவிட மொழிகளின் ஒப்பிலக்கணம் | 25 | 75 | 100 |
| 37 | III | Elective | Paper-2 | 5 | 3 | (கீழ்க்கண்ட மூன்றில் ஏதேனும் ஒன்றைத் தெரிவுசெய்துகொள்ளலாம்) அ. இதழியல் ஆ. புத்தக பதிப்பியல் இ. தமிழ் உரைநடை வரலாறு | 25 | 75 | 100 |
| 38 | III | Elective | Paper-3 | 5 | 3 | (கீழ்க்கண்ட மூன்றில் ஏதேனும் ஒன்றைத் தெரிவுசெய்துகொள்ளலாம்) அ. தமிழர் அழகுக் கலைகள் ஆ. பெண்ணியம் இ. சுற்றுலாவியல் | 25 | 75 | 100 |
| 39 | IV | Skill based Subject | Paper-4 | 3 | 3 | தகவல் தொடர்பியல் | 25 | 75 | 100 |
| 40 | V | Extension Activities | | - | 1 | விரிவாக்கச் செயல்பாடுகள் | 100 | - | 100 |
| TOTAL | | | | 30 | 23 | | 250 | 450 | 700 |

| Part | Subject | Papers | Credit | Total Credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-7) | 57 | 100 | 1500 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others /NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

திருவள்ளூர் பல்கலைக்கழகம்
இளங்கலைப் பட்டப்படிப்பு
தமிழ்

2017-2018 ஆம் கல்வியாண்டு முதல் நடைமுறைப்படுத்தப்படும்

பாடத்திட்டம் (CBCS)
B.A. Tamil Syllabus (CBCS)

முதல் ஆண்டு
முதல்பருவம்

தாள் 1
இலக்கியம் I

இக்கால இலக்கியம் I
(கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)

அலகு 1 : **கவிதை**

- 1) பாரதியார் கவிதைகள்
 1. பகைவனுக்கு அருள்வாய் நன்னெஞ்சே (ப.112)
 2. அறிவே தெய்வம்(பூம்புகார் பதிப்பகம், சென்னை-108, பதிப்பு 1978)
- 2) பாரதிதாசன் கவிதைகள்
 1. உலகப் பண்பாடு (பாடல் எண். 53)
 2. வாளினை எட்டா (பாடல் எண். 64)(கற்பகம் புத்தகாலயம், தி.நகர், சென்னை-17, 2016)
- 3) கண்ணதாசன் கவிதை
 1. அவன்தான் இறைவன் (மூன்றாம் தொகுதி)(வானதி பதிப்பகம், சென்னை-17, பதிப்பு 1973)

அலகு 2 : **உரைநடை**

- 1) ரா.பி. சேதுப்பிள்ளை - தமிழ் இன்பம்
(காவிய இன்பம், கற்பனை இன்பம்)
பழனியப்பா பிரதர்ஸ், சென்னை-14, 2007.
- 2) வ.சுப. மாணிக்கம் - வள்ளுவம்
(அறிவுக் கல்வி, வள்ளுவர் நெஞ்சம்)
மணிவாசகர் பதிப்பகம்,
சென்னை-1, பதிப்பு 1993.

- அலகு 3 : **நாடகம்**
அறிஞர் அண்ணா - ஓர் இரவு
பாவை பப்ளிகேஷன்ஸ்,
இராயப்பேட்டை, சென்னை-14,
பதிப்பு 2008.
- அலகு 4 : **புதினம்**
பிரபஞ்சன் - வானம் வசப்படும்,
நற்றிணை பதிப்பகம்,
திருவல்லிக்கேணி,
சென்னை-5, பதிப்பு, 2012.
- அலகு 5 : **சிறுகதை**
நாஞ்சில் நாடன் - சூடிய பூ சூடற்க
தமிழினி பதிப்பகம்,
இராயப்பேட்டை, சென்னை-14,
பதிப்பு, 2007.

தாள் 2

இலக்கணம் I

நன்னூல் - எழுத்ததிகாரம்

பாடநூல் : நன்னூல் - எழுத்ததிகாரம்
காண்டிகை உரை - ஆறுமுக நாவலர்
(முல்லை நிலையம்,
சென்னை - 1,
பதிப்பு, 2008.)

- அலகு 1 : பாயிரம்
அலகு 2 : எழுத்தியல்
அலகு 3 : பதவியல்
அலகு 4 : உயிரீற்றுப் புணரியல்
அலகு 5 : மெய்யீற்றுப் புணரியல், உருபு புணரியல்

சார்புப்பாடம் - 1

தாள் 1

தமிழக வரலாறும் பண்பாடும் - 1

பாடநூல் :

தமிழக வரலாறும் மக்கள் பண்பாடும்,
டாக்டர் கே.கே. பிள்ளை,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை – 600 113.

- அலகு 1 : 1) தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள்
2) தமிழகத்தின் இயற்கை அமைப்புகள்
3) வரலாற்றுக் காலத்துக்கு முந்திய தமிழகம்
4) சிந்துவெளி அகழ்வாராய்ச்சி
- அலகு 2 : 5) பண்டைத் தமிழரின் அயல்நாட்டுத் தொடர்புகள்
6) தமிழ் வளர்த்த சங்கம்
- அலகு 3 : 7) சங்க இலக்கியம்
8) பண்டைத் தமிழரின் வாழ்க்கை
- அலகு 4 : 9) களப்பிரர்கள்
- அலகு 5 : 10) பல்லவர்கள்
11) தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு வரை
சமூக நிலை

பார்வைநூல்கள் :

1. வே.தி. செல்வம், தமிழக வரலாறும் பண்பாடும்,
மணிவாசகர் பதிப்பகம்,
சென்னை – 600 108.
2. டாக்டர் அ. தட்சிணாமூர்த்தி தமிழர் நாகரிகமும் பண்பாடும்,
யாழ் வெளியீடு,
மேற்கு அண்ணாநகர், சென்னை – 600 004.

இரண்டாம் பருவம்

தாள் 3

இலக்கியம் 2

இக்கால இலக்கியம் 2

(கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)

- அலகு 1 : கவிதை
- 1) நா. காமராசன் - கறுப்பு மலர்கள்
கவிதா பப்ளிகேஷன்ஸ்,
தி.நகர், சென்னை-17, பதிப்பு-2015.
 - 2) மு. மேத்தா - கண்ணீர் பூக்கள்,
கவிதா பதிப்பகம்,
சென்னை-17, பதிப்பு-2007.
- அலகு 2 : உரைநடை
- 1) சுகிசிவம் - வாழப் பழகுவோம் வாருங்கள்,
வானதி பதிப்பகம்,
சென்னை-17, பதிப்பு-2010.
- அலகு 3 : நாடகம்
- 1) பாரதிதாசன் - பிசிராந்தையார்,
பாரி நிலையம்,
சென்னை-108, பதிப்பு-2010.
- அலகு 4 : புதினம்
- 1) தமிழ்ச்செல்வி - அளம்,
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்.,
அம்பத்தூர், சென்னை-98, பதிப்பு-2004.
- அலகு 5 : சிறுகதை
- 1) சிறுகதைத் தொகுப்பு - அண்ணா சாலையில் ஒரு இந்தியன்
(ஆசிரியர் - பன்னிருவர்)
வானதி பதிப்பகம், சென்னை-17.

தாள் 4

இலக்கணம் 2

நன்னூல் - சொல்லதிகாரம்

பாடநூல் : நன்னூல் - சொல்லதிகாரம்
காண்டிகை உரை - ஆறுமுக நாவலர்
(முல்லை நிலையம்,
சென்னை-1,
பதிப்பு-2008)

- அலகு 1 : பெயரியல்
அலகு 2 : வினையியல்
அலகு 3 : பொதுவியல்
அலகு 4 : இடையியல்
அலகு 5 : உரியியல்

சார்புப்பாடம் - 1

தாள் 2

தமிழக வரலாறும் பண்பாடும் - 2

பாடநூல் :

தமிழக வரலாறும் மக்கள் பண்பாடும்,
டாக்டர் கே.கே. பிள்ளை,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை – 600 113.

- அலகு 1 : 1) சோழப் பேரரசின் தோற்றம்
2) சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும்
3) சோழர் காலத்தில் தமிழரின் சமுதாயம்
- அலகு 2 : 4) பாண்டியரின் தோற்றமும் வீழ்ச்சியும்
- அலகு 3 : 5) மதுரை நாயக்கர்கள்
6) தமிழகத்தில் 13 முதல் 18 ஆம் நூற்றாண்டு வரை சமூக நிலை
- அலகு 4 : 7) ஐரோப்பியரின் வரவு
8) பத்தொன்பதாம் நூற்றாண்டின் அரசியலும் தமிழகத்தின் சமூக நிலையும்
- அலகு 5 : 9) இருபதாம் நூற்றாண்டில் தமிழகம்

**இரண்டாம் ஆண்டு
மூன்றாம் பருவம்
சிறப்புப்பாடம்**

**தாள் 5
இலக்கியம் 3**

சமயப்பாடல்களும் சிற்றிலக்கியங்களும்

| | | | | |
|--------|---|------------------------|---|---|
| அலகு 1 | : | திருஞானசம்பந்தர் | - | கோளறு திருப்பதிகம் (10) |
| | | சுந்தரர் | - | திருவதிகை -தம்மாளை அறியாத பாடல்... (10) |
| அலகு 2 | : | திருப்பாணாழ்வார் | - | அமலனாதிபிரான் (10) |
| | | ஆண்டாள் | - | நாச்சியார் திருமொழி (10) (குயில் பத்து) |
| அலகு 3 | : | பிள்ளைத்தமிழ் | - | மீனாட்சியம்மைப் பிள்ளைத்தமிழ் - தாலப் பருவம் |
| | | கலம்பகம் | - | திருக்காவலூர்க் கலம்பகம் (1-10) |
| அலகு 4 | : | கச்சியப்ப முனிவர் | - | கச்சி ஆனந்த ருத்திரேசர் வண்டுவிடு தூது (1-50 கண்ணிகள்) |
| | | சிவப்பிரகாசர் | - | சோணசைலமாலை (1-10) |
| அலகு 5 | : | வேதநாயக சாஸ்திரியார் | - | ஞான நொண்டி நாடகம் பெத்லேகம் குறவஞ்சி |
| | | குணங்குடியார் பாடல்கள் | - | தியானநிலை (1-10) |

தாள் 6
இலக்கணம் 3
யாப்பருங்கலக்காரிகை

- அலகு 1 : உறுப்பியல் - எழுத்து, அசை, சீர்
- அலகு 2 : உறுப்பியல் - தளை, அடி, தொடை
- அலகு 3 : செய்யுளியல் - வெண்பா, ஆசிரியப்பா
- அலகு 4 : செய்யுளியல் - கலிப்பா, வஞ்சிப்பா, மருட்பா
- அலகு 5 : ஒழிபியல்

சார்புப்பாடம் - 2

தாள் 3

தமிழ் இலக்கிய வரலாறு - 1

பாடநூல் : தமிழ் இலக்கிய வரலாறு,
முனைவர் கி. இராசா,
நியூ செஞ்சுரி புக் ஹவுஸ்,
சென்னை - 98.

- அலகு 1 : சங்க காலம் & சங்க இலக்கியங்கள் (1 - 42)
- அலகு 2 : பதினெண்கீழ்க்கணக்கு நூல்கள் முதல் காப்பியங்கள் வரை (43 - 54)
- அலகு 3 : இரட்டைக் காப்பியங்கள் முதல் பக்தி இலக்கியங்கள் வரை (65 - 97)
- அலகு 4 : இடைக்கால இலக்கிய இலக்கணங்கள் முதல் சிற்றிலக்கியங்கள் வரை (98 - 155)
- அலகு 5 : சைவத் திருமடங்களின் தமிழ்த்தொண்டு முதல் வைணவர்களின் தமிழ்த்தொண்டு (159 - 163)

பார்வை நூல்கள் :

1. முனைவர் அ. ஜெயம் : தமிழ் இலக்கிய வரலாறு
சந்திரலேகா வைத்தியநாதன் ஜனகா பதிப்பகம்,
63, தம்பையா சாலை, மேற்கு மாம்பலம்,
சென்னை - 600 003.
2. எம்.ஆர். அடைக்கலசாமி : தமிழ் இலக்கிய வரலாறு,
பால்நிலா பதிப்பகம்,
லயோலா நகர், சென்னை - 600 024.
3. சி. பாலசுப்பிரமணியன் : தமிழ் இலக்கிய வரலாறு,
பாரி நிலையம்,
184, பிராட்வே, சென்னை - 600 108.

திறன் அடிப்படையிலான விருப்பப்பாடம் - 1

தாள் 1

பயன்பாட்டுத் தமிழ்

பாடநூல் :

கா. பட்டாபிராமன் - மொழிப் பயன்பாடு,
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்.,
41-பி, சிட் கோ இன்டஸ்ட்ரியல் எஸ்டேட்,
அம்பத்தூர்.

- அலகு 1 : ஆசிரியர் கடிதம்
- அலகு 2 : அலுவலகம் கடிதம்
- அலகு 3 : விளம்பரத் தமிழ், பதிப்பாசிரியர்
- அலகு 4 : மெய்ப்புத் திருத்தலும் நூலாக்கப் பணியும்
- அலகு 5 : வானொலி, தொலைக்காட்சி நிகழ்ச்சிகளில் பங்குபெறல், ஆவணங்கள் வரைதல்.

துறை சாரா விருப்பப்பாடம் - 1

தாள் 1

தமிழ்மொழி – அடிப்படை இலக்கணம்

பாடநூல் : தவறின்றித் தமிழ் எழுத,
மருதூர் அரங்கராசன்,
ஐந்திணைப் பதிப்பகம்,
279, பாரதி சாலை, திருவல்லிக்கேணி, சென்னை-5,
போன் : 044 – 28549410

- அலகு 1 : எப்படி எழுதினால் என்ன (பக். 16 முதல் 39 வரை)
- அலகு 2 : அளவான இலக்கணம் (பக். 40 முதல் 60 வரை)
- அலகு 3 : தொடர் இலக்கணம் (பக். 60 முதல் 95 வரை)
- அலகு 4 : வலிமிகும் இடங்கள் (பக். 97 முதல் 127 வரை)
- அலகு 5 : வலிமிகா இடங்கள் (பக். 128 முதல் 174 வரை)

நான்காம் பருவம்

சிறப்புப்பாடம்

தாள் 7

இலக்கியம் 4காப்பியங்கள்

- அலகு 1 : சிலப்பதிகாரம் - புகார்க்காண்டம் - மனையறம்படுத்த காதை, வழக்குரை காதை
- அலகு 2 : மணிமேகலை - பாத்திரம் பெற்ற காதை
உதயணகுமார காவியம் (1-40 பாடல்கள்)
- அலகு 3 : பெரியபுராணம் - இளையான்குடி மாறநாயனார் புராணம் முழுவதும்
- அலகு 4 : கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்
- அலகு 5 : தேம்பாவணி -பாலமாட்சிப் படலம் முழுவதும்
சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்

தாள் 8
இலக்கணம் 4
தண்டியலங்காரம்

பாடநூல் : தண்டியலங்காரம் (பொருளணியியல் மட்டும்)

- அலகு 1 : தன்மையணி மற்றும் உவமை அணி (1&2 அணிகள்)
- அலகு 2 : உருவக அணி முதல் முன்ன விலக்கணி முடிய (3-6 அணிகள்)
- அலகு 3 : வேற்றுப்பொருள் வைப்பணி முதல் தற்குறிப்பேற்ற அணி முடிய (7-12 அணிகள்)
- அலகு 4 : ஏது அணி முதல் அவநுதி அணி முடிய (13-23 அணிகள்)
- அலகு 5 : சிலேடையணி முதல் பாவிக அணி முடிய (24-35 அணிகள்)

சார்புப்பாடம் - 2

தாள் 4

தமிழ் இலக்கிய வரலாறு - 2

- பாடநூல் :** தமிழிலக்கிய வரலாறு,
முனைவர் கி. இராசா,
நியூ செஞ்சுரி புத்தக நிலையம்,
சென்னை - 98.
- அலகு 1 :** சித்தர் இலக்கியம் முதல் தமிழகத்தில் வேற்றரசர் ஆட்சி
(164 முதல் 192 வரை)
- அலகு 2 :** இஸ்லாமியரின் தமிழ்த்தொண்டு முதல் மறுமலர்ச்சிக்கால இலக்கியம்
(193 முதல் 207 வரை)
- அலகு 3 :** ஐரோப்பியர்களின் தமிழ்ப்பணி முதல் கிறிஸ்தவர்களின் தமிழ்ப்பணி
(208 முதல் 214 வரை)
- அலகு 4 :** இக்கால இலக்கியம் முதல் புலம்பெயர் இலக்கியம்
(215 முதல் 311 வரை)
- அலகு 5 :** இணையத்தமிழ் முதல் தமிழும் சாகித்திய அகாடமி விருதுகளும்
(301 முதல் 320 வரை)

திறன் அடிப்படையிலான விருப்பப்பாடம் - 2

தாள் 2

படைப்பிலக்கியமும் மொழிபெயர்ப்பும்

| | | | | |
|--------|---|---------------|---|--|
| அலகு 1 | : | மரபுக்கவிதை | - | வெண்பா அல்லது ஆசிரியப்பா |
| அலகு 2 | : | புதுக்கவிதை | - | 20 அடிகள் |
| அலகு 3 | : | சிறுகதை | - | குறிப்பிட்ட பொருளில் மூன்று பக்கங்களில் அமைதல் |
| அலகு 4 | : | ஓரங்க நாடகம் | - | கொடுக்கப்படும் தலைப்பை ஒட்டி நான்கு அல்லது ஐந்து பக்கங்களில் அமைதல். |
| அலகு 5 | : | மொழிபெயர்ப்பு | - | 100 சொற்கள் அடங்கிய ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல். |

(பொதுவாக மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, ஓரங்கநாடகம் இவற்றின் இலக்கணம் - அமைப்பு - பாடுபொருள் போன்றவற்றைக் கற்பித்து அதன் பிறகு படைப்புகளுக்கான பயிற்சி அளித்தல் வேண்டும். மொழிபெயர்ப்பின் நுட்பங்கள் மொழிபெயர்ப்பின் வகைகளைக் கற்பித்தல் வேண்டும்)

துறை சாரா விருப்பப்பாடம் - 2

தாள் 2

இணையம்

பாடநூல் :

இணையமும் இனிய தமிழும்,
முனைவர் க. துரையாசன்,
இணைப்பேராசிரியர் தமிழ்த்துறை,
அரசினர் கலைக்கல்லூரி (தன்னாட்சி), கும்பகோணம்-1.

இசை பதிப்பகம்,
24,சபரிநகர், டாக்டர் குருமூர்த்தி சாலை,
கும்பகோணம் - 1,
அலைபேசி : 9442426552, தொலைபேசி : 0435 – 2402501.

- அலகு 1 : இணையம் - அறிமுகமும் வரலாறும் - செய்திகளைத் தேடிப் பெறுதல் -
இணையம் - சொற்பொருள் - தொலைபேசிக் கம்பி வழித் தகவலறியும் சேவை -
வலைப்பின்னல் - முதல் இணையதளம் - தமிழில் முதல் இணையதளம் -
இணையமுகவரி - இணையத்தின் பயன்கள் - இணைய மாநாடுகள்.
- அலகு 2 : இணையவழித் தமிழ் கற்றலும் கற்பித்தலும் - மரபுசார் கற்பித்தல் முறைகள் -
ஆசிரியரை மையமாகக் கொண்ட கல்விமுறை - மாணவரை மையமாகக்
கொண்ட கல்வி முறை - இணையவழிக் கற்றலும் கற்பித்தலும் - பயன்கள் -
இணையவழி தமிழ் கற்றல் - கற்பித்தல் - தமிழ் இணையப் பல்கலைக்கழகம் -
கல்வித்திட்டம் - மழலைக்கல்வி - சான்றிதழ்க்கல்வி - மேல்நிலை -
மேற்சான்றிதழ்கள் கல்வி - பட்டயக் கல்வித்திட்டங்கள் - பட்டப்படிப்பு -
இணையவழித் தேர்வு - பாட வடிவமைப்பு - கணினித்தமிழ்ப் பணிகள் -
தொடர்பு மையங்கள்.
- அலகு 3 : மின்னஞ்சலும் மின்நூலகமும் - மின்னஞ்சல் - மின்னஞ்சல் முகவரி -கடவுச்சொல்
- மின்னஞ்சல் உருவாக்கம் - கவனத்தில் கொள்ள வேண்டியவை -
கலந்துரையாடல் - மின்நூலகம் - தமிழ் இணையப் பல்கலைக்கழக மின்நூலகம்
- இலக்கண நூல்கள் - இலக்கிய நூல்கள் - சமய இலக்கியங்கள்
சிற்றிலக்கியங்கள் - பிற இலக்கியங்கள் - இருபதாம் நூற்றாண்டு இலக்கியங்கள்
(உரைநடை) - கவிதை - மதுரைத்திட்டம் - இந்திய மொழிகளின் நடுவண்
நிறுவனம் போன்றவை.
- அலகு 4 : ஒருங்கு குறியீட்டுமுறை-குறியாக்கமுறை -பிட்டுமுறை - தமிழில் ஒருங்கு குறியீட்டு
முயற்சிகள் - தமிழ்நெட் 97 - தமிழ்நெட் 99 - எழுத்துருக்கள் - தமிழ்
எழுத்துருக்கள் - இணைய இதழ்கள் - திண்ணை - தமிழ்த்திணை போன்றவை -
இணைய இதழ்களின் நிறை குறைகள் - வலைப்பூ வலைப்பூவும்
இணையதளமும் - உருவாக்கம் - தமிழில் வலைப்பூக்கள் தமிழ்ப்பூக்கள் -
மானிடன் - திரட்டிகள் - போன்றவை.

அலகு 5 : தமிழ்ப் பல்கலைக்கழகங்கள் - கல்விசார் இணைய தளங்கள் - கற்பிப்பவை - நூலகங்கள் - தகவல்களை வழங்குபவை - விக்கிபீடியா - தமிழ்விக்கிபீடியா - மனிதவள மேம்பாட்டுத்துறை - தமிழ்நாடு மாநில உயர்கல்வி மன்றம் - தமிழ்நாடு அறிவியல் மற்றும் தொழில்நுட்ப மன்றம் - உயர்கல்வித்துறை - தமிழ் வளர்ச்சித்துறை - வேலைவாய்ப்பு இணைய தளங்கள் - தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையம் - மத்திய அரசுப் பணியாளர் தேர்வாணையம் - இந்திய ஆட்சிப்பணி - ஆசிரியர் தேர்வு வாரியம் - இணைய வேலை வாய்ப்பு மையங்கள் வேலை வாய்ப்பகத் தகவல்கள்.

பார்வை நூல்கள் :

1. முனைவர் மு. இளங்கோவன் : இணையம் கற்போம்,
வயல்வெளிப் பதிப்பகம்,
இடைக்கட்டு உள்கோட்டை (அஞ்சல்),
கங்கைகொண்ட சோழபுரம் (வழி),
அரியலூர் மாவட்டம் - 612 901.
2. மு. பழனியப்பன் : கணினியும் இணையமும்,
மீனாட்சி நூலக வெளியீடு,
புதுக்கோட்டை - 622 003.
3. மு. பழனியப்பன் : இணைய உலகம்,
எஸ்.ரவிச்சந்திரன் பாமா பதிப்பகம்,
சென்னை - 24.
4. பவானி : இன்றைய வாழ்க்கையின் இணையம்,
ஜெய்சங்கர் பப்ளிகேஷன்ஸ்,
38, நடேச அய்யர் தெரு,
தி.நகர், சென்னை - 17.

ஐந்தாம் பருவம்
சிறப்புப்பாடம் - தாள் 9

இலக்கியம் - 5 சங்க இலக்கியம் (அகம்)

| | | | | |
|--------|---|---------------|---|--|
| அலகு 1 | : | நற்றிணை | - | 51 முதல் 65 வரை |
| அலகு 2 | : | குறுந்தொகை | - | 101 முதல் 125 வரை |
| அலகு 3 | : | கலித்தொகை | - | குறிஞ்சிக்கலி - முதல் 5 பாடல்கள் முல்லைக்கலி - முதல் 5 பாடல்கள் |
| அலகு 4 | : | அகநானூறு | - | நித்திலக்கோவை 331 - 340 பாடல்கள் |
| அலகு 5 | : | பத்துப்பாட்டு | - | நெடுநல்வாடை |

தாள் 10

இலக்கணம் - 5

பாடநூல் : நம்பியகப்பொருள்

- அலகு 1 : அகத்திணையியல்
- அலகு 2 : களவியல் - பாங்கியற்கூட்டம் முடிய
- அலகு 3 : களவியல் - பகற்குறி முதல் வரைவிடை வைத்துப்
பொருள்வயிற் பிரிவு முடிய
- அலகு 4 : வரைவியல்
- அலகு 5 : கற்பியல், ஒழிபியல்

தாள் 11

தமிழ்மொழி வரலாறு

பாடநூல் : தமிழ்மொழி வரலாறு,
டாக்டர் சு. சக்திவேல்,
மணிவாசகர் பதிப்பகம்,
8/7, சிங்காரத்தெரு, பாரிமுனை,
சென்னை – 600 108.

- அலகு 1 : தோற்றுவாய்
பழங்காலத் தமிழ்
- அலகு 2 : இடைக்காலத் தமிழ்
- அலகு 3 : தற்காலத் தமிழ்
கல்வெட்டுத் தமிழ்
- அலகு 4 : தமிழில் பிறமொழிக் கலப்பு
தமிழ்க் கிளைமொழிகள்
தமிழ்ச் சொற்பொருள் மாற்றம்
- அலகு 5 : தமிழ்த் தொடரியல்
தமிழ் வரிவடிவம்

தாள் 12

இலக்கியத் திறனாய்வு

பாடநூல் : இலக்கியத் திறனாய்வியல்,
தா.ஏ. ஞானமூர்த்தி,
ஐந்திணைப் பதிப்பகம்,
279, பாரதி சாலை மாடியில்,
திருவல்லிக்கேணி, சென்னை – 600 005.

- அலகு 1 : இலக்கிய ஆய்வு முதல் இலக்கியக்கலை வரை
அலகு 2 : இலக்கிய உணர்ச்சி முதல் மானிட உண்மை வரை
அலகு 3 : வடிவம் முதல் பாட்டு வரை
அலகு 4 : காப்பியம் முதல் நனவோடை புதினம் வரை
அலகு 5 : சிறுகதை முதல் இலக்கிய இயக்கங்கள் வரை

பார்வை நூல்கள் :

1. டாக்டர் சு. பாலச்சந்திரன் : இலக்கியத் திறனாய்வு,
நியூ செஞ்சுரி புக் ஹவுஸ் பி. லிட்.,
41-பி, சிட்கோ இன்டஸ்ட்ரியல்ஸ் லிமிடெட்,
அம்பத்தூர், சென்னை.
2. டாக்டர் மு. வரதராசன் : இலக்கியத்திறன்,
பாரிநிலையம்,
184, பிராட்வே, சென்னை.
3. அ.ச. ஞானசம்பந்தம் : இலக்கியக்கலை,
கழக வெளியீடு, சென்னை – 600 108.
4. முனைவர் கே. பழனிவேலு : கோட்பாட்டியல் திறனாய்வுகள்,
அகரம், மனை எண்-1,
நிர்மலா நகர், தஞ்சாவூர் - 613 007.

விருப்பப்பாடம் - 1

தாள் 1

- அ. தகவல் தொழில்நுட்பம்
- ஆ. நாட்டுப்புறவியல்
- இ. விளம்பரக்கலை

குறிப்பு : மேற்கண்ட மூன்று விருப்பப் பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து கொள்ளலாம்.

அ. தகவல் தொழில்நுட்பம்

பாடநூல் : தமிழ்மொழி மூலம் தகவல் தொழில்நுட்பம்,
A.K. கோகிலன்,
நிபு செஞ்சுரி புக ஹவுஸ் (பி) லிட்.,
41-பி, சிட்கோ இன்டஸ்ட்ரியல் எஸ்டேட்,
அம்பத்தூர், சென்னை – 600 098.

- அலகு 1 : தகவல் தொழில்நுட்பம் தொடர்பான அறிமுகம் முதல் கணினிக் களஞ்சியம் வரை
- அலகு 2 : நிரற்பகுதி முதல் கணினி மொழிகள் வரை
- அலகு 3 : தரவு அனுப்பல் முறைகள் முதல் தரவுத்தள முறைமைகள் வரை
- அலகு 4 : முறைமைக்கொள்கை முதல் கணினி வைரஸ்கள் மற்றும் காப்பு மென்னுறுப்புகள் வரை
- அலகு 5 : கணினிப் பணியகம் முதல் மின்வர்த்தகம் வரை

ஆ. நாட்டுப்புறவியல்

- அலகு 1 : நாட்டுப்புறவியல் வரலாறு - விளக்கம் - நாட்டுப்புறவியல் - சமூகவியல் - மானுடவியல் - உளவியல் நோக்கு - நாட்டுப்புற இலக்கியமும் ஏட்டிலக்கியமும் - பழமொழிகள் - விடுகதைகள் - புராணக்கதைகள்.
- அலகு 2 : நாட்டுப்புறவியல் வளர்ச்சி வரலாறு - தொல்காப்பியம் குறிப்பிடும் பண்ணத்தி, பிசி, புலன் சங்க இலக்கியங்களின் வள்ளைப்பாட்டு முதலியன. சிலப்பதிகாரத்தின் வரிப்பாடல்கள் - குரவைப்பாட்டு - திருவாசகத்தின் திருப்பொற்சுண்ணம் முதலானவை - சிற்றிலக்கிய வகைகளின் வளர்ச்சி - தாயுமானவர் - இராமலிங்கர் - பாரதியார் - பாரதிதாசன் ஆகியோர் பாடல்களில் நாட்டுப்புறப் பாடல்களின் வடிவங்கள்.
- அலகு 3 : ஏட்டிலக்கியத்திற்கும் வாய்மொழி இலக்கியத்திற்கும் இடையே உள்ள ஒற்றுமை வேற்றுமைகள் - பழக்க வழக்கங்கள் - நாகரிகமும் பண்பாடும் - சமய உணர்ச்சி - வாழ்க்கைநெறி போன்றவை - நாட்டுப்புறக் கலைகள் - கூத்து - ஆட்டம் - நடனம் - கும்மி - கோலாட்டம்.
- அலகு 4 : நாட்டுப்புறப் பாடல்கள் - வகைகள் - குழந்தைப் பாடல்கள் - தொழில் பாடல்கள் - விளையாட்டுப் பாடல்கள் - கொண்டாட்டப் பாடல்கள் - உணர்ச்சிப் பாடல்கள் - இழவு - சடங்குப் பாடல் முதலானவை.
- அலகு 5 : நாட்டுப்புறப் பாடல்கள் பாடும் நேரமும் இடமும் - வடிவங்கள் - மெட்டுகள் - இசையொலிகள் - பாநலம் - வருணனை - உவமை - கற்பனை - நீதிகள் முதலியன - நாட்டுப்புறக் கதைகள் - வகைகள் - கதைப்பாடல்கள் முதலியன.

பார்வை நூல்கள் :

1. சு. சக்திவேல் : நாட்டுப்புற இயல் ஆய்வு, மணிவாசகர் பதிப்பகம், 12-ஆ, மேலசன்னதி வீதி, சிதம்பரம்-1.
2. சு. சண்முக சுந்தரம் : நாட்டுப்புற இயல், மணிவாசகர் பதிப்பகம், 8/7, சிங்கர் தெரு, பாரிமுனை, சென்னை-108.
3. ஆறு. அழகப்பன் : நாட்டுப்புறப் பாடல்கள் - திறனாய்வு, கழக வெளியீடு, 79, பிரகாசம் சாலை, சென்னை-1.
4. ஆறு. இராமநாதன் : நாட்டுப்புறவியல் ஆய்வுகள், மணிவாசகர் பதிப்பகம், சிதம்பரம் - 608 001.

இ. விளம்பரக்கலை

பாடநூல் :

விளம்பரக்கலை,
ச. ஈஸ்வரன்,
இரா. சபாபதி.

அலகு 1 : விளம்பரம் - விளக்கங்கள் - விளம்பரத்தின் இயல்புகள் - அறிவிப்பும் விளம்பரமும் - விளம்பரத்தின் தன்மைகள் - விளம்பர எல்லை - விளம்பர நோக்கங்கள் - விளம்பர வரலாறு - குறிக்கோள்கள்.

அலகு 2 : விளம்பர வகைகள், விளம்பரத்தின் பயன்கள்

- 1) விளம்பரங்களின் வகைகள்
- 2) விளம்பர தளங்களைத் தேர்ந்தெடுக்கும் பொழுது கவனிக்கப்பட வேண்டியவை
- 3) விளம்பரத்தினால் உற்பத்தியாளர்கள் அடையும் நன்மைகள்
- 4) விளம்பரத்தினால் நுகர்வோர் அடையும் நன்மைகள்
- 5) விளம்பரத்தினால் அரசும் பிற நிறுவனங்களும் அடையும் நன்மைகள்
- 6) விளம்பரத்தினால் சமூகம் அடையும் நன்மைகள்

அலகு 3 : விளம்பர நெறிகள்

- 1) விளம்பர ஒழுக்க நெறிகள்
- 2) தடை செய்யப்பட்ட விளம்பரங்கள்
- 3) விளம்பரத்திற்கான சில விதிமுறைகள்
- 4) விளம்பர வரைவின் அடிப்படைத் தத்துவங்கள்

அலகு 4 : விளம்பரப் பணிகள், விளம்பரத்தின் தாக்கம்

- 1) விளம்பரத்தின் பணிகள்
- 2) விளம்பர நிறுவனங்கள்
- 3) விளம்பர அறங்கள்
- 4) விளம்பரத்தின் தாக்கம்
- 5) அகநிலை

அலகு 5 : விளம்பர மேம்பாடு

- 1) விளம்பரங்களின் மொழிநிலை
- 2) விளம்பர உத்திகள்
- 3) விளம்பரம் தொடர்பான சட்டங்கள்

தாள் 3

திறன் அடிப்படையிலான விருப்பப்பாடம் - 3

கல்வெட்டியல்

பாடநூல் :

இரா. நாகசாமி நடனகாசிநாதன், கு. தாமோதரன், ச. ஹரிஹரன்
கல்வெட்டியல்
கட்டுரைகள் - 3, 7 முதல் 15 முடிய
தமிழ்நாடு அரசு தொல்பொருள் ஆய்வுத் துறை,
சென்னை - இரண்டாம் பதிப்பு - 1980.

- அலகு 1 : தமிழ் எழுத்து, கல்வெட்டின் அமைப்பு
- அலகு 2 : தமிழ்க் கல்வெட்டுக்கள், தமிழ்க் கல்வெட்டுக்கள்
- அலகு 3 : தமிழ்க் கல்வெட்டுக்கள் - 2, தமிழ்க் கல்வெட்டுக்கள் - 3
- அலகு 4 : தமிழ்க் கல்வெட்டுக்கள் - 4, வடமொழிக் கல்வெட்டுக்கள்
- அலகு 5 : செப்பேடுகள்
நகல்

ஆறாம் பருவம்

சிறப்புப்பாடம் - தாள் 13

இலக்கியம் - 6 சங்க இலக்கியம் (புறம்)

- அலகு 1 : பதிற்றுப்பத்து - மூன்றாம் பத்து
- அலகு 2 : புறநானூறு - பாடல் எண். 51 முதல் 65 வரை
(மொத்தம் 15 பாடல்கள்)
- அலகு 3 : பரிபாடல் - 2 பாடல்கள்
1. மாயோயே மாயோயே எனத் தொடங்கும் பாடல்
மூன்றாம் பாடல் - திருமால்
2. பாயிரும் பனிக்கடல் பார்த்துகள் படப்புக்கு எனத்
தொடங்கும் ஐந்தாம் பாடல் (செவ்வேள் 81 அடிகள்)
- அலகு 4 : பத்துப்பாட்டு - சிறுபாணாற்றுப்படை
- அலகு 5 : திருக்குறள் - 10 அதிகாரங்கள்
பொருட்பால் - தெரிந்து தெளிதல் முதல்
ஊக்கமுடைமை வரை

தாள் 14

இலக்கணம் - 6

பாடநூல் : புறப்பொருள் வெண்பாமாலை – பாடாண் படலம் முடிய

- அலகு 1 : வெட்சிப்படலம், கரந்தைப்படலம்
அலகு 2 : வஞ்சிப்படலம், காஞ்சிப்படலம்
அலகு 3 : நொச்சிப்படலம், உழிஞைப்படலம்
அலகு 4 : தும்பைப்படலம், வாகைப்படலம்
அலகு 5 : பாடாண்படலம்

தாள் 15

திராவிட மொழிகளின் ஒப்பிலக்கணம்

பாடநூல் : திராவிட மொழிகளின் ஒப்பிலக்கணம்,
திராவிட மொழிகள் - 1 & 2
டாக்டர் ச. அகத்தியலிங்கம்,
மணிவாசகர் பதிப்பகம்,
31, சிங்கர்தெரு, பாரிமுனை, சென்னை – 600 108.

- அலகு 1 : திராவிட மொழிகள் (5-ஆம் பகுதி நீங்கலாக) முதல் திராவிட மொழிக்
கல்வெட்டுகள் வரை
- அலகு 2 : திராவிடமொழி இலக்கணங்கள்
தமிழ்மொழி இலக்கணங்கள் முதல் முத்துவீரியம் வரை
- அலகு 3 : திராவிடமொழிகள் - 2ஆம் பகுதி
1) மொழியும் மாற்றங்களும் முதல் ஒப்பியல் வரை
- அலகு 4 : திராவிடமொழியியல் வரலாறு முதல் ழ வரை
- அலகு 5 : பெயர்ச்சொல் முதல் திராவிடமொழிகளில் எண்ணுப்பெயர்கள் வரை

விருப்பப்பாடம் - 2

தாள் 2

அ. இதழியல்
ஆ. புத்தகப் பதிப்பியல்
இ. தமிழ் உரைநடை வரலாறு

குறிப்பு : மேற்கண்ட மூன்று விருப்பப் பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து கொள்ளலாம்.

அ. இதழியல்

- அலகு 1 : இதழியல் : விளக்கம் - இதழ்களின் பணிகளும் பொறுப்புகளும் - இதழ்கள் வகைகளும் இயல்புகளும் - மக்களாட்சியில் இதழியல் - இதழ்களின் சுதந்திரம் - இதழ்களின் நடத்தையறக் கோட்பாடுகள் - இதழியல் தொழில் வாய்ப்புகள்
- அலகு 2 : இதழியல் வளர்ச்சி வரலாறு - தமிழகத்தில் இதழியல் வளர்ச்சி - பத்திரிகைச் சட்டங்கள் - பத்திரிகை மன்றம் - இதழ்கள் தொடங்குவதற்குரிய வழிமுறை செய்தித்தாள் நிர்வாக அமைப்பு.
- அலகு 3 : செய்தியாளர் - செய்தி - செய்தியின் உள்ளடக்கங்கள் - செய்தி திரட்டுதல் - செய்தி நிறுவனங்கள் - பேட்டி - குற்றச் செய்திகள் - பல்வேறு வகையான செய்திகள் - செய்திகளும் சிறப்புத் தனி இயல்புகளும் - படங்களும் இதழ்களும்.
- அலகு 4 : செய்திகளைச் செப்பணிடுதல் - நுட்பங்கள் - ஆசிரியர் - செய்தி ஆசிரியர் - துணை ஆசிரியர்கள் - செய்தியின் கட்டமைப்பு - பக்க வடிவமைப்பு - அச்சப்படி திருத்துதல் - பக்க வடிவமைப்பு - அச்சப்படி திருத்துதல் - அச்சப்பிழை திருத்தக் குறியீடுகள் - இதழியல் கலைச் சொற்கள்.
- அலகு 5 : இதழியல் மொழிநடை - தலையங்கம் - சிறப்புத் தனிக் கூறுகள் - திறனாய்வு - இதழ்களில் எழுதுவது எப்படி? - இதழ்களில் விளம்பரம் - தற்காலத் தமிழ் இதழ்களின் எழுச்சியும் வீழ்ச்சியும் - நல்ல இதழ்கள் : எவை, எப்படி?.

பார்வை நூல்கள் :

1. டாக்டர் கு. முத்துராசன் : இதழியல் வளர்ச்சியும் மொழிபெயர்ப்பும், ஐந்திணைப் பதிப்பகம், அஞ்சல் பெட்டி எண்.2989, 279, பாரதி சாலை மாடியில், (பைகிராப்ட்டஸ் சாலை), திருவல்லிக்கேணி, சென்னை - 600 005.

2. இரா. கோதண்டபாணி : இதழியல்,
கற்பக நூலகம், 21 அ. ஆசாரி தெரு,
தல்லாகுளம், மதுரை – 625 002.
3. கோ. கலைவாணி : பத்திரிகைக் கலை,
சாரதா வெளியீடு, 4, மானம் பார்த்த சமேதார் தெரு,
குயப்பேட்டை, வேலூர் - 632 001.
4. டாக்டர் தங்கமணியன் : பத்திரிகையியல்,
மாணிக்கம் பதிப்பகம், மானச கங்கோத்தரி,
மைசூர் - 570 006.

ஆ. புத்தகப் பதிப்பியல்

- பாடநூல் :** புத்தகக் கலை - முனைவர் அ. விநாயகமூர்த்தி,
பாலமுருகன் பதிப்பகம்,
63, புதுத்தெரு, செங்குட்டை, காட்பாடி - 632 007,
வேலூர் மாவட்டம், போன் : 0416 - 2295247
- அலகு 1 :** புத்தகம் - வகைகள் - பதிப்பு - வகைகள் - தழுவலும் மொழிபெயர்ப்பும் - மலிவுப்பதிப்பு - அகராதிகள் - கலைச்சொல் அகராதி - கொள்ளைப் பதிப்பு.
- அலகு 2 :** ஏட்டுச் சுவடிப் பதிப்பு - புத்தகம் பெயர்க்காரணம் - சில சிறப்பு நூலகங்கள் - எழுது கருவிகள் - ஏட்டுப் பிரதிகளின் வகைகள் - மூலத்தை முடிவு செய்தல் - பாடத்திருத்தம்.
- அலகு 3 :** பதிப்பாசிரியர் - பதிப்புக்குழு - பதிப்பாசிரியரின் பொறுப்புகள் - தகுதிகள் - சுருக்கக் குறியீட்டு விளக்கம் - நிறுத்தக்குறிகள் - சந்தி பிரித்தல் - அகர நிரல் - மொழி நடை படங்கள் - பதிப்பும் சட்டமும்.
- அலகு 4 :** அச்சகம் - அச்சத் தொழில் வரலாறு - ஈ புகஸ் இன்டர்நெட் பத்திரிகை - அச்சகங்களின் வகைகள் - அச்ச எழுத்துகளின் வடிவம் - அச்சக் கோத்தல் - அச்சடித்தல் - அச்சிடும் முறைகள் - காகிதம் - காகிதச் சோதனை - அச்ச மைகள் - பட அச்ச - கணினி அச்ச.
- அலகு 5 :** புத்தக உறுப்புகள் - பதிப்புரிமைப் பக்கம் முதலாயின - புத்தக வடிவம் - பக்க எண்கள் - மெய்ப்புப்படி திருத்துதல் - திருத்தக் குறியீடுகள் - பைண்டிங் வகைகள் - வெளியிடுபவர் - புத்தகத் தயாரிப்பு நிர்வாகம் - எழுத்துரிமைத் தொகை - ஒப்பந்தம் - பதிப்புரிமை - விற்பனையாளர் வாணிக நிபந்தனைகள் - பன்னாட்டுத் தரப்புத்தக எண் (ISBN) பொது நூலக இயக்ககம் - விற்பனை வழிகள் கண்காட்சிகள் - பொருட்காட்சிகள்.

பார்வை நூல்கள் :

1. மா.சு. சம்பந்தன், : அச்சுக்கலை,
தமிழர் பதிப்பகம், சென்னை, 1960.
2. அ. ஆலிஸ், : மக்கள் தகவல் தொடர்பியல் கலைச்சொல் அகராதி,
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3. மா.பா. குருசாமி : இதழியல் கலை,
குருதேமொழி பதிப்பகம்,
4. எஸ். ராஜம் (பதி) : சந்தி குறியீட்டு விளக்கம்,
மர்ரே அண்டு கம்பெனி, சென்னை, 1958.
5. ஜே. பெர்னான்டஸ், : கம்ப்யூட்டர் புரோக்ரமிங் & அப்ளிகேஷன்ஸ்,
என். வெங்கடசாமி மூன் பப்ளிஷர்ஸ், மதுரை, 1998.

இ. தமிழ் உரைநடை வரலாறு

- பாடநூல் :** தமிழ் உரைநடை வரலாறு
வி. செல்வநாயகம்,
குமரன் புத்தக இல்லம்,
குமரன் காலனி, சென்னை- 26,
மறுபதிப்பு, 2000.
- அலகு 1 :** **சங்க காலம்**
1. தமிழ்ச் செய்யுளின் ஆரம்பநிலை
2. உரைநடை ஆரம்பம்
3. சிலப்பதிகாரத்திலுள்ள உரைநடை
4. இசைநாடகத் தமிழும் உரையும்
5. தொல்காப்பியம் குறிக்கும் உரைநடை வகை
- அலகு 2 :** **களவியலுரைக் காலம்**
1. களவியலுரைக் கால நூல்கள்
2. களவியலுரையிலுள்ள இருவகை நடை
3. பாரத வெண்பாவிலுள்ள உரைநடை
4. சாசனத் தமிழ் உரைநடை
5. மணிப்பிரவாள நடையின் தோற்றம்
- அலகு 3 :** **உரையாசிரியர்களின் காலம்**
1. உரை வளர்ச்சிக்குரிய காரணம்
2. உரை வகுத்த ஆசிரியர்கள்
3. உரையாசிரியர்கள் கையாண்ட நடைவகை
4. சாசனத்தமிழ் உரைநடை
5. மணிப்பிரவாள நடை
- அலகு 4 :** **ஐரோப்பியர் காலம்**
1. உரைநடையில் உண்டான மாற்றம்
2. ஐரோப்பியர் வகுத்த உரைநடை
3. பழைய மரபு தழுவிய உரைநடை
4. ஆறுமுக நாவலரும் இக்கால உரைநடையும்
5. 19-ஆம் நூற்றாண்டிலிருந்த பிற உரைநடை வகைகள்
- அலகு 5 :** **இருபதாம் நூற்றாண்டு**
1. தனித்தமிழ் நடை
2. மறுமலர்ச்சி நடை
3. உரையும் நடையும், உரைநடையும்

ஆறாம் பருவம்

விருப்பப்பாடம் - 1

தாள் 1

அ. தமிழர் அழகுக் கலைகள்
ஆ. பெண்ணியம்
இ. சுற்றுலாவியல்

குறிப்பு : மேற்கண்ட மூன்று விருப்பப் பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து கொள்ளலாம்.

அ. தமிழர் அழகுக் கலைகள்

பாடநூல் : தமிழர் வளர்த்த அழகுக் கலைகள்,
மயிலை சீனி. வேங்கடசாமி,
NCBH
41, பி, சிட்கோ இண்டர்ஸ்ரீஸ்,
அம்பத்தூர், கிண்டி, சென்னை - 58.

அலகு 1 : அழகுக்கலை - கட்டடக்கலை - குகைக் கோயில்கள் - கற்றளிகள் - மரக் கட்டடங்கள் - செங்கற்கட்டடங்கள் - பாறைக் கோயில்கள் போன்றவை (பக். 1 முதல் 46 வரை)

அலகு 2 : சிற்பக்கலை - சிற்பம் அமைக்கும் பொருள்கள் - இரண்டு வகைச் சிற்பங்கள் - கல்லும் உலோகமும் - யவன நாட்டுச் சிற்பமும் நமது நாட்டுச் சிற்பமும் - ஓவியக்கலை (பக். 47 முதல் 86 வரை)

அலகு 3 : கூத்துக்கலை - காவியக்கலை - பதினோர் ஆடல் - பரத நாட்டியம் - காவியப் புலவனும் ஓவியக்கலைஞனும் சிந்தாமனர் - சூளாமணி - தேவாரம் - இராமாயணம் முதலியன (பக். 87 முதல் 161 வரை)

அலகு 4 : நாடகக்கலை - நாடக நூல்கள் - நாடக இலக்கணம் - ஒன்பதுசுவை - நடிப்பு - நாடகக் கலையின் மறுமலர்ச்சி போன்றவை (பக்.162 முதல் 194 வரை)

அலகு 5 : கலைகளைப் போற்றும் - கடற்கரைகோயில் - பல்லவர் சோழர் கோயில்கள் - மேல்நாட்டாரின் கலை ஆர்வம் - வேலூர் மண்டபம் - சிற்பங்கள் (பக்.195 முதல் 237 வரை)

பார்வை நூல்கள் :

1. முனைவர் பாக்யமேரி
காலந்தோறும் தமிழர் கலைகள்,
அறிவுப் பதிப்பகம்,
142, ஜானிஜான்கான் ரோடு,
சென்னை - 14.
2. திரு.வி. கலியாணசுந்தரனார்
தமிழர் கலை,
பாரிநிலையம்,
59, பிராட்வே, சென்னை - 1.
3. க.சி. கமலையா
தமிழகக் கலை வரலாறு,
மணிவாசகர் பதிப்பகம்,
55, லிங்கி தெரு, சென்னை.

ஆ. பெண்ணியம்

- பாடநூல் :** பெண்ணியம்,
முனைவர் இராம. பிரேமா,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
டி.டி.டி.ஐ. (அஞ்சல்), தரமணி, சென்னை - 600 113.
- அலகு 1 :** பெண்ணியம் - சொற்பொருள் விளக்கம் - பெண்ணியத்தின் தோற்றமும்
வளர்ச்சியும் - 1970-75 ஆம் ஆண்டுகளில் பெண்ணிய வளர்ச்சி முதலானவை
(பக். 1 முதல் 33 வரை)
- அலகு 2 :** எண்பதுகளில் பெண்ணியம் - பெண்ணியத்தின் எதிர்காலம் - பெண்ணிய
வகைகள் முதலானவை. (பக். 33 முதல் 55 வரை)
- அலகு 3 :** குடும்ப அமைப்பு - பால்தன்மை - பெண்ணின் வரலாறு - தீவிரவாதப் பெண்ணிய
வாதிகளின் செயற்பாடுகள் - பெண்ணியக் கோட்பாட்டாளர்கள் - பெண்ணிய
நூல்கள் (பக். 56 முதல் 75 வரை)
- அலகு 4 :** மகளிரியல் கல்வி - பெண்ணிய இயக்கத் திறனாய்வு - மொழியும் உளவியல்
பகுப்பாய்வும் - மார்க்சியப் பெண்ணியம் (பக். 6 முதல் 96 வரை)
- அலகு 5 :** இந்தியப் பெண்ணிய வரலாறு - இந்தியப் பெண்களின் கூட்டமைப்பு - இந்திய
தேசிய பெண்கள் குழு - அகில இந்திய பெண்கள் மாநாடு முதலானவை
(பக். 96 முதல் 117 வரை)

பார்வை நூல்கள் :

1. டாக்டர் முத்துச் சிதம்பரம் பெண்ணியம் தோற்றமும் வளர்ச்சியும்,
தமிழ்ப்புத்தகாலயம்,
சிவப்பிரகாசம் தெரு, தி. நகர்,
சென்னை.
2. பேராசிரியர் நா. ஜெயபாலன் பெண்ணியம் ஓர் ஆய்வு,
மோகன் பதிப்பகம்,
4, பாரதி சாலை, திருவல்லிக்கேணி,
சென்னை - 5.

இ. சுற்றுலாவியல்

- பாடநூல் :** சுற்றுலா வளர்ச்சி,
வெ. கிருட்டிணமூர்த்தி,
மணிவாசகர் பதிப்பகம்,
31, சிங்கர் தெரு, பாரிமுனை, சென்னை-18.
- அலகு 1 :** சுற்றுலாவியல் அறிமுகம் - அமைப்பாளர்கள் (Organizers), வழிகாட்டிகள் (Guides), பணிகள் (Tourists) பற்றிய செய்திகள்.
- அலகு 2 :** பண்டைக் காலச் சுற்றுலாப் பயணிகள் (யுவான் சுவாங் பாஹியான் மார்க்கோ போலோ) மூவரின் பயண அனுபவக் குறிப்புகள்.
- அலகு 3 :** சுற்றுலாப் பயன்கள் (அறிவு வளர்ச்சி – பொருளாதார வளர்ச்சி, வேலை வாய்ப்பு)
- அலகு 4 :** தமிழகத்தின் புகழ்மிக்க தலங்கள் மாமல்லபுரம் - சிற்பக் கலை - தஞ்சைப் பெரிய கோயில் - கட்டடக் கலை, சித்தன்னவாசல் - ஓவியக்கலை.
- அலகு 5 :** தமிழகத்தில் சுற்றுலா வளர்ச்சிக்கான வாய்ப்புகள் (தமிழகச் சுற்றுலாத் துறையின் செயற்பாடும் வளர்ச்சிப் பயன்களும்)

பார்வை நூல்கள் :

1. மா. இராசசேகர், சுற்றுலாவியல்,
கொங்குப் பதிப்பகம்,
பாண்டியன் நகர்,
சின்னாண்டான் கோயில், கரூர்.
2. முனைவர் ச. ஈஸ்வரன், சுற்றுலாவியல்,
பாவை பப்ளிகேஷன்ஸ்,
142, ஜானி ஜான்கான் சாலை,
இராயப்பேட்டை, சென்னை - 14,
போன் : 28482441.

தாள் 4

திறன் அடிப்படையிலான விருப்பப்பாடம் - 4

தகவல் தொடர்பியல்

பாடநூல் : முனைவர் கி. இராசா — மக்கள் தகவல் தொடர்பியல் அறிமுகம், பாவை பப்ளிகேஷன்ஸ், 142, ஜானிஜான்கான் சாலை, இராயப்பேட்டை, சென்னை — 600 014.

- அலகு 1 : கொள்கைகளும் கோட்பாடுகளும்
அலகு 2 : தகவல் தொடர்புச் சாதனங்கள்
அலகு 3 : வானொலி
அலகு 4 : தொலைக்காட்சி, திரைப்படம்
அலகு 5 : விளம்பரம்

பார்வை நூல்கள் :

1. வே. தயாளன், வ. ஜெயா : மக்கள் தகவல் தொடர்பியல், ஜெயா பதிப்பகம், கோயம்புத்தூர் - 1998.
2. முனைவர் மு. கோமதி, : தகவல் தொடர்பு ஊடகங்களில் இலக்கியச் செல்வாக்கு மோகன் முகில் பதிப்பகம், 10, தண்டபாணி நகர், கோண்டூர், கடலூர்-2.
3. வெ. கிருஷ்ணமூர்த்தி, : தகவல் தொடர்பியல், மணிவாசகர் பதிப்பகம், சென்னை, 1991.
4. வெ. நல்லதம்பி, : தொலைக்காட்சியும் பிறதகவல் துறைகளும், வள்ளுவன் வெளியீட்டகம், திருவான்மியூர், சென்னை - 41, 1990.

THIRUVALLUVAR UNIVERSITY
BACHELOR OF ARTS
B.A. ENGLISH
DEGREE COURSE
CBCS PATTERN
(With effect from 2017-2018)

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|------------|------|------------------------------|---------|------------------|--------|--------------------------------|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-I | | | | | | | CIA | Uni. Exam | Total |
| 1. | I | Language | Paper-1 | 6 | 4 | Tamil /other Languages | 25 | 75 | 100 |
| 2. | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3. | III | Core Theory | Paper-1 | 5 | 4 | Indian Writing in English | 25 | 75 | 100 |
| 4. | IV | Core Theory | Paper-2 | 5 | 4 | Advanced English Grammar | 25 | 75 | 100 |
| 5. | V | Allied - 1 | Paper-1 | 6 | 4 | Literary Forms and Terms | 25 | 75 | 100 |
| 6. | VI | Environ mental Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 22 | | 150 | 450 | 600 |

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|-------------|------|--------------------|---------|------------------|--------|-------------------------------------|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-II | | | | | | | CIA | Uni. Exam | Total |
| 7. | I | Language | Paper-2 | 6 | 4 | Tamil /other Languages | 25 | 75 | 100 |
| 8. | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9. | III | Core Theory | Paper-3 | 5 | 4 | British Literature-I | 25 | 75 | 100 |
| 10. | III | Core Theory | Paper-4 | 5 | 4 | American Literature -I | 25 | 75 | 100 |
| 11. | IV | Allied-1 | Paper-2 | 6 | 4 | The Social History of England | 25 | 75 | 100 |
| 12. | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13. | IV | Soft skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|--------------|------|---------------------------|---------|------------------|--------|---|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-III | | | | | | | CIA | Uni. Exam | Total |
| 14. | I | Language | Paper-3 | 6 | 4 | Tamil /other Languages | 25 | 75 | 100 |
| 15. | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16. | III | Core Theory | Paper-5 | 5 | 4 | British Literature-II | 25 | 75 | 100 |
| 17. | IV | Core Theory | Paper-6 | 5 | 4 | American Literature-II | 25 | 75 | 100 |
| 18. | V | Allied-2 | Paper-3 | 5 | 4 | History of English Literature -I | 25 | 75 | 100 |
| 19. | VI | Skill based subject | Paper-1 | 3 | 3 | Skill for Employment - I | 25 | 75 | 100 |
| 20. | IV | Non- Major Elective | Paper-1 | 2 | 2 | Language skills and Communication I | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|-------------|------|------------------------|---------|------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-IV | | | | | | | CIA | Uni. Exam | Total |
| 21. | I | Language | Paper-4 | 6 | 4 | Tamil /other Languages | 25 | 75 | 100 |
| 22. | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23. | III | Core Theory | Paper-7 | 5 | 4 | British Literature- III | 25 | 75 | 100 |
| 24. | III | Core Theory | Paper-8 | 5 | 4 | History of English Language | 25 | 75 | 100 |
| 25. | III | Allied-2 | Paper-4 | 5 | 4 | History of English Literature-II | 25 | 75 | 100 |
| 26. | IV | Skill based Subject | Paper-2 | 3 | 3 | Skill for Employment-II | 25 | 75 | 100 |
| 27. | IV | Non-Major Elective | Paper-2 | 2 | 2 | Language skills and communication II | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|------------|------|---------------------|----------|------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-V | | | | | | | CIA | Uni. Exam | Total |
| 28. | III | Core Theory | Paper-9 | 5 | 4 | British Literature - IV | 25 | 75 | 100 |
| 29. | III | Core Theory | Paper-10 | 5 | 4 | Language and Linguistics | 25 | 75 | 100 |
| 30. | III | Core Theory | Paper-11 | 5 | 4 | Introduction to Literary Criticism | 25 | 75 | 100 |
| 31. | III | Core Theory | Paper-12 | 6 | 4 | Indian literature in Translation | 25 | 75 | 100 |
| 32. | III | Elective | Paper-1 | 4 | 3 | Journalism and Mass communication (or)Techniques of Translation | 25 | 75 | 100 |
| 33. | IV | Skill based subject | Paper-3 | 3 | 3 | Conversational English | 25 | 75 | 100 |
| | | | | 30 | 22 | | 150 | 450 | 600 |

| Sl.No. | Part | Study Components | | Ins.hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|-------------|------|-------------------------|----------|------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER-VI | | | | | | | CIA | Uni. Exam | Total |
| 34. | III | Core Theory | Paper-13 | 6 | 5 | Shakespeare | 25 | 75 | 100 |
| 35. | III | Core Theory | Paper-14 | 6 | 4 | British Literature- V | 25 | 75 | 100 |
| 36. | III | Core Theory | Paper-15 | 6 | 4 | New Literatures in English | 25 | 75 | 100 |
| 37. | III | Elective | Paper-2 | 4 | 3 | Technology Mediated English (or) Business English | 25 | 75 | 100 |
| 38. | V | Elective | Paper-3 | 4 | 3 | Copy –editing and proof Reading (or) Effective Communication | 25 | 75 | 100 |
| 39. | VI | Skill based subject | Paper-4 | 4 | 3 | English Language Teaching | 25 | 75 | 100 |
| 40. | V | Extension Activities | | | 1 | | 100 | | 100 |
| | | | | 30 | 23 | | 250 | 450 | 700 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|-------------|------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 4 | 8 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-5) | 61 | 100 | 1500 |
| Part IV | Environmental Science | 1 | | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang.&others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension Activity | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

SEMESTER-I
Paper -1 - INDIAN WRITING IN ENGLISH

UNIT I: POETRY

- | | |
|-------------------------|-----------------------------------|
| 1. Sarojini Naidu: | Love and Death |
| 2. Jayanta Mahapatra: | Evening Landscape by the River |
| 3. Rabindranath Tagore: | Lyric No. LXXIII (from Gitanjali) |
| 4. Toru Dutt: | Our Casuarina Tree |

References:

1. Indian Yarns: An Anthology of Indian English Writing. Cambridge University Press, 2013.
2. Tagore, Rabindranath. Gitanjali. Wellesley: branden Books, 2000
3. Ramaswamy, S. Commentaries on Commonwealth Poetry and Drama. New Delhi: Prestige Books, 1994.

UNIT II: PROSE

- | | |
|------------------------|----------------------------------|
| 1. Jawaharlal Nehru: | A Tryst with Destiny |
| 2. Rabindranath Tagore | Realization of the Infinite |
| 3. Shashi Tharoor: | Ajanta and Ellora in the Monsoon |

References:

1. Indian Yarns: An Anthology of Indian English Writing. Cambridge University Press, 2013.
2. Dutta, Krishna. Ed. Rabindranath Tagore: An Anthology. New Delhi: Oxford University Press, 1998.

UNIT III: SHORT STORIES

- | | |
|----------------|------------------|
| 1. Ruskin Bond | The Eyes Have it |
| 2. Anita Desai | A Devoted Son |

UNIT IV: DRAMA

- | | |
|------------------|-----------------------|
| 1. Girish Karnad | The Fire and the Rain |
|------------------|-----------------------|

References:

Karnad, Girish, The Fire and the Rain New Delhi: Oxford University Press, 1999.

UNIT V: FICTION

- | | |
|-----------------|----------------------|
| 1. R.K. Narayan | The Bachelor of Arts |
|-----------------|----------------------|

SEMESTER I

PAPER – 2 - ADVANCED ENGLISH GRAMMAR

UNIT I

Introduction to Modern English grammar

Sentences – various types of sentence – simple – compound – complex – declaratives – interrogatives – imperatives – exclamatives.

Basic sentence patterns in English - constituents of sentences – subject – verb – object - complement - adverbials.

UNIT II

Clauses - main and subordinate clauses - noun clauses - relative clauses - adverbial clauses - finite and non-finite clauses - analysis and conversion of sentences – Active to Passive and vice versa – Direct to Indirect and vice versa – Degrees of Comparison, one form to the other.

UNIT III

Phrases - various types of phrases - noun, verb, adjectival and prepositional phrases.

Words - parts of speech – nouns – pronouns – adjectives - verbs - adverbs – prepositions – conjunctions - determinatives.

UNIT IV

Nouns - different types - count and uncount – collective - mass - case - number – gender.

Pronoun - different types - personal, reflexive - infinite-emphatic – reciprocal.

Adjectives - predicative - attributive - pre- and post-modification of nouns.

Verbs - tense-aspect - voice - mood - Concord - types of verbs – transitive – intransitive finite – non-infinite.

Helping verbs and modal auxiliaries - function and use.

UNIT V

Adverbs - different types - various functions - modifying and connective.

Prepositions - different types - syntactic occurrences - prepositional phrases - adverbial function.

Conjunctions - subordinating and coordinating Determinatives articles - possessives – quantifiers

Same words used as different parts of speech – Words followed by appropriate prepositions.

Books for Study and Reference:

A Remedial English Grammar for Foreign Students. Publisher: Macmillan.

Author: F T Wood

Carter, Ronald and Michael McCarthy. Cambridge Grammar of English. CUP, 2006.

Greenbaum, Sidney. Oxford English Grammar. Indian Edition. Oxford University Press, 2005.

SEMESTER I
ALLIED - 1 - PAPER - 1 - LITERARY FORMS AND TERMS

UNIT I : PROSE

1. The Essay
2. The Short Story
3. Biography
4. Autobiography

UNIT II : POETRY

1. The Lyric
2. The Sonnet
3. The Elegy
4. The Epic
5. The Ode
6. The Ballad

UNIT III : DRAMA

1. Comedy
2. Tragedy & Tragic Comedy
3. One-act play
4. Mystery and Miracle Play
5. The Absurd Drama
6. Monologue

UNIT IV: NOVEL

1. Historical Novel
2. Psychological Novel
3. Stream of consciousness Novel
4. Realistic Novel
5. Science Fiction

UNIT V: LITERARY TERMS

Poetry: Simile, Metaphor, Allusion, Rhyme, Oxymoron, Blank-Verse, Symbolism

Drama: Soliloquy, Climax and Anti-climax, Unity of Time, Place and Action

Prose: Allegory, Didacticism, Fable, Satire, Irony

Books for Study and Reference:

Prescribed text – A Glossary of Literary Terms. M.H. Abrams – Macmillan Publishers India Ltd. (Trinity -Laxmi Publications, Chennai)

Prasad, Birjadish. A Background to the Study of English Literature. Chennai: Macmillan India Press, 2007.Print.

Baldick, Chris. The Concise Oxford Dictionary of Literary Terms, Delhi: OUP, 1990

SEMESTER II

PAPER – 3 – BRITISH LITERATURE I

Objectives:

- To enable the learners to appreciate the versatility and knowledge of the Elizabethan age.
- To enable the students to understand the history and the growth of English Literature.

UNIT I: POETRY (Detailed Study)

Geoffrey Chaucer : The Prologue to Canterbury Tales:

Whan that april with his shoures
soote....And eek in what array that they
were inne; (1-41lines)

Edmund Spenser : Sonnet 75: One Day I Wrote Her Name upon
the Strand

UNIT II : PROSE (Detailed Study)

Francis Bacon : of Adversity, of Beauty, of Honour and
Reputation

UNIT III : DRAMA (Detailed Study)

Christopher Marlowe : Dr. Faustus

UNIT IV : POETRY (Non-Detailed Study)

John Donne : The Good Morrow

George Herbert : The Pulley

UNIT V : DRAMA (Non-Detailed Study)

Ben Jonson : Every Man in His Humour

Books for Study and Reference:

Greenblatt, Stephen Ed. *The Norton Anthology of English Literature*, Vol B, 16th and early 16th century, W.W Norton & Company, Inc., 9th Edition. 2012

Marlowe, Christopher. *The Tragical History of Doctor Faustus*. Ed Roma Gill, New Delhi, Bloomsbury Methuen Drama. 2015

Dave, Smita., *Christopher Marlowe*. New Delhi, Arnold Heinemann publishers (India) Private Limited. 1974.

Jump, John., *Marlowe: Doctor Faustus*. New York, Palgrave Macmillan. 2007

Ellis-Fermor, Una., *The Jacobean Drama*, London, University Paperbacks. 1969

Web Resources

Literary Texts – Prose, Poetry and Fiction:

<http://www.library.utoronto.ca/utel/works.html>

SEMESTER II

PAPER– 4 - AMERICAN LITERATURE-I

UNIT I- POETRY (Detailed)

Whitman : One's Self I Sing
E.A. Poe : To Helen
Emily Dickinson : I taste a liquor never Brewed

UNIT II- POETRY (Non- Detailed)

Carl Sandburg : Happiness
Robert Frost : Mending Wall
Ezra Pound : The Rest

UNIT III- PROSE (Detailed)

Emerson : The American Scholar

UNIT IV- DRAMA (Detailed)

Eugene O'Neil : The Hairy Ape

UNIT V- FICTION (Non- Detailed)

Herman Melville : Moby Dick (The Whale)

Books for Study and Reference:

Fisher, William J., H. Willard Reninger, Ralph Samuelson, and K. B. Vaid. *An Anthology American Literature of the Nineteenth Century*. S. Chand & Company Ltd. New Delhi, 1955. Print.

Oliver, Egbert S. *An Anthology of American Literature 1890-1965*. S. Chand & Company Ltd. New Delhi, 1967. Print.

Melville, Herman. *Moby- Dick*. Harper & Brothers Publishers. London, 1851. Print.

SEMESTER II
ALLIED - 1 - PAPER - 2 – THE SOCIAL HISTORY OF ENGLAND

UNIT I

1. Tudor England (1485 to 1603)
2. The Renaissance
3. The Reformation and the Counter Reformation

UNIT II

1. Puritanism
2. Restoration England (1660 to 1688): Social Life
3. The Age of Queen Anne (1702 to 1714)
4. The Industrial Revolution and the Agrarian Revolution

UNIT III

1. The effects of the French Revolution on British Life.
2. The Victorian Age (1837 to 1901)
3. The Reform Bills

UNIT IV

1. The Dawn of Twentieth Century
2. Life Between the Two World wars (1919 to 1939)
3. The effects of World War II and the Cold War
4. Life in the Sixties.

UNIT V

1. Life in the Seventies
2. Life in the Eighties
3. The Origin and Growth of Political Parties in England
4. Contemporary Life in England.

Prescribed text

Padmaja Ashok. The Social History of England . Orient Black swan Pvt. Ltd.

SEMESTER III

PAPER –5– BRITISH LITERATURE II

Objectives:

- To expose the students to the Neo-classical tradition in literature
- To enable them to explore the remarkable changes in literary forms
- To train them to comprehend the trends in the literary expression of the period

UNIT I : POETRY (Detailed Study)

John Milton : Paradise Lost Book IV: (Lines 131-287)

So on he fares, and to the border comes...Of
living creatures, new to sight and strange

Thomas Gray : Elegy Written in a Country Churchyard

William Blake : The Tyger

UNIT II :

Prose (Detailed Study)

Samuel Johnson : Preface to Shakespeare: His histories, being
neither tragedies nor comedies... are to
copy nature and instruct life (extract)

Drama (Detailed Study)

Oliver Goldsmith : She Stoops to Conquer

UNIT III : POETRY (Non-Detailed Study)

Andrew Marvell : On a Drop of Dew

John Dryden : A Song for St. Cecilia's Day

UNIT IV: PROSE (Non-Detailed Study)

Joseph Addison : 1. Popular Superstitions
2. Will wimble Selections from 'The Spectator'

UNIT V: FICTION (Non-Detailed Study)

Jonathan Swift

: Gulliver's Travels

Books for Study and Reference:

Lynn, Mary Johnson Ed., John E. Grant. *Blake's Poetry and Designs*. Norton Critical Edition. 2004.

Defoe, Daniel. *Robinson Crusoe*. Ed. Pramod K. Nayar. Hyderabad, Orient BlackSwan. 2011

Ellis, Frank H. *Twentieth Century Interpretations of Robinson Crusoe*. Spectrum Book. 1969.

Grierson, HJC. *Metaphysical Lyrics and Poems of the Seventeenth Century*. Oxford University. 1972.

The Norton Anthology of English Literature: The Restoration and the Eighteenth Century. Norton. 1962.

Web Resources

Literary Texts – Prose, Poetry and Fiction:
<<http://www.library.utoronto.ca/utel/works.html>>

SEMESTER III

PAPER –6 – AMERICAN LITERATURE-II

UNIT I-POETRY (Detailed)

E.E.Cummings : Among Crumbling People

Wallace Stevens : Anecdote of a Jar

Sylvia Plath : Mirror

UNIT II- POETRY (Non-Detailed)

William Carlos William : The Yachts

Hart Crane : *from* The Bridge: To Brooklyn Bridge

John Crowe Ransom : Bells For John Whiteside's Daughter

UNIT III- PROSE

Robert Frost : The Figure a Poem Makes

UNIT IV- DRAMA (Detailed)

Tennessee Williams : The Glass Menagerie

UNIT V- FICTION (Non -Detailed)

Ernest Hemingway : The Snows of Kilimanjaro

Books for Study and Reference:

1. Oliver, Egbert S. *An Anthology of American Literature 1890-1965*. S.Chand & Company Ltd. New Delhi, 1967. Print.
2. Thomas, C.T, Ed. *Twentieth Century Verse An Anglo-American Anthology*. Macmillan Publisher India Ltd. Reprinted 2009.

SEMESTER III

ALLIED 2 – PAPER 3 -HISTORY OF ENGLISH LITERATURE I

UNIT I:

The Age of Chaucer - Chapters II & III

UNIT II:

The Development of Drama - Chapters IV & V

UNIT III:

The Age of Shakespeare- Chapters VI, VII & VIII

UNIT IV:

The Age of Milton - Chapters IX & X

UNIT V:

The Age of Dryden -Chapters XI & XII

Prescribed Book: W.H. Hudson: An Outline History of English Literature

Reference: History of English Literature Author: Edward Albert

SEMESTER III

SKILL BASED SUBJECT - PAPER 1 - SKILL FOR EMPLOYMENT I

UNIT - I

Oral Communication Skills Listening & Hearing, Barriers to Everyday Listening

UNIT - II

Workplace Listening, Documentation

UNIT - III

Written Communication skills

UNIT - IV

Reading, Barriers, Reading Strategies

UNIT - V

Ability to Read & follow instructions, giving and Receiving Instructions, Directions, Language of Instructions Transcoding Information graphic Communication, Charts, Tables & Transcoding

Books for Study and Reference:

Communication and soft skills: SP Dhanavel. Orient Blackswan

English & Soft skills: SP Dhanavel. Orient black swan.2010

Essential English : E. Suresh kumar P.Sreehari J. Savithri.2010

G M Sundaravalli, A S Kamalakar, P Kusuma Harinath. Communication and Softskills Vol 1: Orient Blackswan, 2015

English for Competitive examinations: Manamohan Bhatnagar.

SEMESTER III
NON-MAJOR ELECTIVE - PAPER 1 -
LANGUAGE SKILLS AND COMMUNICATION I
(for other departments)

UNIT - I

1. Meeting people
2. Exchanging greetings
3. Introducing, others, giving personal information, taking about people animals and places

UNIT - II

1. Answering telephone, asking for someone
2. Making enquiries on the phone
3. Dealing with wrong number
4. Taking and leaving messages

Books for Study and Reference:

Mastering communication skills and soft skills

N.Krishnaswamy, Manju Dariwal, Lalitha Krishnaswamy(Bloomsbury)

SEMESTER IV

PAPER - 7 - BRITISH LITERATURE III

Objectives:

- To understand the roots of Romantic Literature.
- To familiarize the students with the outstanding writers of the period.

UNIT I: POETRY (Detailed Study)

William Wordsworth : I Wander Lonely as a Cloud

S. T. Coleridge : Time, Real and Imaginary

John Keats : Ode to Autumn

Percy Bysshe Shelly : Ode to a Skylark

UNIT II: PROSE

Charles Lamb : Poor Relations

William Hazlitt : On going a Journey

UNIT III: POETRY (Non-Detailed)

Lord Byron : She Walks in Beauty

Robert Burns : A Red Red Rose

UNIT IV: FICTION

Jane Austen : Pride and Prejudice

UNIT V: FICTION

Walter Scott : Ivanhoe

Books for Study and Reference:

Nayar, k Pramod. *The English Romantic Poets: An Anthology*. Orient Blackswa. 2013

Ed. Hollingworth. *Essays: Hazlitt*. University Tutorial Press Limited.

Scott, Sir Walter. *Ivanhoe*. J.M. Dent and Sons Limited. 1977.

Plowman, Max. *An Introduction to the Study of William Blake*. Atlantic Publishers and Distributors. New Delhi. 1994.

Gill, Stephen. Ed., WU, Duncan. *William Wordsworth Selected Poetry*. Oxford University Press. New York. 2008.

Blunden, Edmund. Ed., *Selected Poems John Keats*. Rupa Publications India Private Limited. New Delhi. 2011.

Jump. D. John, *Byron*. Routledge & Kegan Paul Ltd. U.S.A. 1972.

Bloom, Harold. Ed., *Jane Austen's Pride and Prejudice*. Viva Books Private Limited. New Delhi. 2010.

Web Resources

Literary Texts – Prose, Poetry and Fiction:

<<http://www.library.utoronto.ca/utel/works.html>>

SEMESTER IV

PAPER 8 - THE HISTORY OF ENGLISH LANGUAGE

UNIT I

Origin of English Language

General Characteristics of the Origin of English language

Indo European family

UNIT II

Shakespeare's Contribution to the Growth of English Language.

Milton's Contribution to the Growth of English Language

UNIT III

The Pronunciation, Spelling & Vocabulary Development

Role of Dictionary in the Marking of English language

Change of Meaning

UNIT IV

Growth of English Vocabulary loan words in Latin, French, Greece and Indian

The Contribution of foreign Languages to English

UNIT V

Differences between British English and American English

The Evolution of Standard English

Prescribed Text:

Outline History of English Language C.L.Wren. Macmillian J.D.O' Connor.

Better English in pronunciation (second edition) .Cambridge

Reference:

F.T. Wood: An Outline History of English Language. Delhi, Macmillan India Limited, 1969.

Krishnaswamy. N. Verma, S.K. Nagarajan. M. Modern Applied Linguistics. Chennai, Macmillan Limited, 2000.

Cruttenden, Alan. Gimson's Pronunciation of English. London, Oxford University Press, 2001.

AC.Baugh. History of English Language

Lalitha Ramamoorthy : A History of English Language & Elements of Phonetics, Macmillan.

Baugh, Albert. C. Cable, Thomas. A History of The English Language. Delhi, Routledge, 2000.

Crystal, David. Linguistics. Great Britain, Richard Clay Ltd, 1985

SEMESTER IV

ALLIED 2- PAPER 4 – HISTORY OF ENGLISH LITERATURE II

UNIT 1:

The Age of Pope - Chapters XIII & XIV

UNIT II:

The Age of Johnson - Chapters XV - XVII

UNIT III:

The Age of Wordsworth - Chapters XVIII - XXI

UNIT IV:

The Age of Tennyson - Chapters XXII & XXIV

UNIT V:

The Age of Hardy & the Present Age - Chapters XXV & XXVII

Prescribed Book: W.H. Hudson: An Outline History of English Literature

Reference: Edward Albert: History of English Literature

SEMESTER IV
SKILL BASED SUBJECT - PAPER 2
SKILL FOR EMPLOYMENT II

UNIT -I

Interpersonal Communication

UNIT -II

Information collection - telephone conversation

Encoding & Decoding strategies

UNIT -III

Communication with Employees - Supervisors and customers

Employment Communication goal setting, Written, Spelling & Grammar

UNIT -IV

Job Application and Interview, covering letter, Resume, Interview, Frequently asked Questions

Model Interview

UNIT -V

Polite Behavior in Communication

The Importance of being courteous – Politeness - Body Language - facial language
- Eye contact

Books for Study and Reference:

S.P. Dhanavel. Communication and Soft skills. Mainspring Publishers

SEMESTER IV
NON-MAJOR ELECTIVE - PAPER 2 –
LANGUAGE SKILLS AND COMMUNICATION II
(for other departments)

UNIT I

1. Getting people's attention and interrupting
2. Giving instructions and seeking clarification
3. Making requests, Asking for direction and giving directions

UNIT II

1. Inviting, Accepting and refusing invitation
2. Apologising and responding to an apology
3. Congratulating and responding to congratulations
4. Asking for, Giving and refusing permission

Prescribed Text: Kamlesh Sadan and and Susheela Punitha. Spoken English:

A Foundation Course (Part I). Orient black swan.2014

SEMESTER V

PAPER 9 -- BRITISH LITERATURE IV

Objectives

- To enable students to analyse literary works through careful study of the Victorian Age.
- To integrate critical sources effectively into their analysis of literature.

Unit I : Poetry (Detailed Study)

| | |
|------------------------|--------------------------------|
| Alfred Lord Tennyson | : The Lady of Shalott – Part I |
| Robert Browning | : Memorabilia |
| Dante Gabriel Rossetti | : The Blessed Damozel |

Unit II : Poetry (Non-Detailed study)

| | |
|-----------------------|------------------|
| Alfred Lord Tennyson | : Ulysses |
| Gerard Manley Hopkins | : God's Grandeur |
| Christina Rossetti | : Remember |

Unit III : Prose (Detailed study)

| | |
|-------------------|------------------------------|
| John Henry Newman | : The Idea of a University - |
|-------------------|------------------------------|

If I were asked to describe as briefly and popularly as I could,... how the “gentlemanlike” can otherwise be maintained; and maintained in this way it is.(extract)

Unit IV : Drama

(Detailed study)

| | |
|-------------|-------------------------|
| Oscar Wilde | : Lady Windermere's Fan |
|-------------|-------------------------|

(Non-Detailed study)

| | |
|---------------------|--------------------|
| George Bernard Shaw | : Arms and the Man |
|---------------------|--------------------|

Unit V : Fiction (Non-Detailed study)

Thomas Hardy : Far from the Madding Crowd

Charles Dickens : Oliver Twist

Books for Study and Reference

Gilbert, J. Garraghan S. J. Prose Types in Newman. New York: Schwartz, Kirwin & Faussi.

Hill, Robert W. Jr. Tennyson's Poetry. New York: W. W. Norton & Co, 2010. Print.

Sen, S. G. M. Hopkins: Selected poems. New Delhi: Unique Publishers, 2008. Print.

Wilde, Oscar. The Importance of being Earnest and Other Plays. United States: OPU, 2008. Print

Steane, J. B. Literature in Perspective: Tennyson. London: Evans Brothers Limited.

Web Resources

Literary Texts – Prose, Poetry and Fiction:
<<http://www.library.utoronto.ca/utel/works.html>>

SEMESTER V

PAPER 10 - LANGUAGE AND LINGUISTICS

UNIT I

The Origins of Language

The Development of Writing

Introduction to sounds

Words Stress, Strong & weak forms

Sentences stress & intonation, Voice Modulation

UNIT II

The properties of Language

Morphology

Communication process barriers to Communication

Group talk

UNIT III

Phrases and sentence: grammar syntax

Grammar

UNIT IV

Semantics: Language & Mechanics

Non- Verbal Presentation skills public speaking & presentation skills

UNIT V

Language Varieties

Language, Society and Culture

Preparing for Interview

Books for Study and Reference:

George Yule: The Study of Language . Cambridge University Press. 1996

John Lyons: Language and linguistics: An Introduction. (Cambridge)

Spring Board to success: Sharada Kaushik Bindu Bajwa. Orient black swan.2011

SEMESTER V

PAPER 11 - INTRODUCTION TO LITERARY CRITICISM

UNIT I

1. PLATO

Age and Works – View of Art – Attack on Poetry – The Function of Poetry – Comments on Drama – Observations on Style

2. ARISTOTLE

Critical Works and their Nature – The Plan of Poetics – Observations on Poetry – Observations on Tragedy

UNIT II

1. SIR PHILIP SIDNEY

The Writer and his Work - The ‘Argument’ of his Book – Respect for Rules

2. BEN JONSON

The Critic and his Work – Classicism – The Qualifications of a Poet – Observations on Style

UNIT III

1. JOHN DRYDEN

Critical Works – The Nature of Poetry – The Function of Poetry – Dramatic Poetry

2. ALEXANDER POPE

Critical Work – Classicism – On the Function of Criticism – Remarks on Literature

UNIT IV

1. W. WORDSWORTH

The occasion and Limitations of his Critical Work – concept of poetic diction - Concept of Poetry

2. S. T. COLERIDGE

The Nature of his Critical Work – Theory of Imagination

UNIT V:

1. MATTHEW ARNOLD

Critical Works – Criticism on Poetry – On Criticism

2. T. S. ELIOT

Classicism – True Criticism – Impersonality of Poetry – Other Concepts

Prescribed Book:

B. Prasad. An Introduction to English Criticism. Macmillan. (Trinity:Laxmi Publications).2014

Books for study and Reference

S.Ramaswami V.S.Sethuraman .The English Critical Tradition. An Anthology of English Literary Criticism (Volume I&II)

SEMESTER V

PAPER -12- INDIAN LITERATURE IN TRANSLATION

UNIT I: INTRODUCTION TO TRANSLATION

1. Survey of the History, Growth and role of Translation in India
2. Key concepts in Translation

From Wordworlds: Translation and Communication

UNIT II: POETRY

1. Subramania Bharati : Wind,9 (113)
2. Chemmanam Chacko : Rice (148-149)
3. Jyoti Lanjewar : I Never Saw You (171-175)
4. Gaddar : It Will Not Stop
5. Sahir Ludhianvi : Let's Weave a Dream

UNIT III: PROSE

1. Rassundari Devi : Amar Jiban (My Life)The sixth composition (199-202)
2. A.K.Ramanujan : Telling Tales: Tales have Relatives all over the word Pg 456-462
3. P.Sivakami : Land: Woman's Breath and Speech
4. Durga Khote : Memories of the Marathi Stage (1910 -26)

I had inherited...taking its course Pg 42 - 47

UNIT IV: DRAMA

Girish Karnad : Tughlaq

UNIT V: FICTION

Shanmugasundaram :Nagammal

SHORT STORIES

- | | |
|------------------------|----------------------|
| 1. R.Chudamani | : Does Anyone Care? |
| 2. Prabanchan | : Brahma Vriksha |
| 3. Satyam Sankarmanchi | : The Flood |
| 4. B.M. Zuhara | : Literacy |
| 5. Afrose Sayeeda | : Destination Spring |

Prescribed Text:

Wordscapes: Indian Literature in Translation, Oxford University Press

SEMESTER V

ELECTIVE PAPER 1 – JOURNALISM & MASS COMMUNICATION

UNIT-I MASS COMMUNICATION-ORIGIN AND DEVELOPMENT

1. Need for Communication.
2. Types of Communication.
3. Elements of Communication.
4. Barriers of Communication.
5. 7-C's of Communication.
6. Functions and uses of Mass Communication.

UNIT-II JOURNALISM

1. What is Journalism?
2. History of Journalism
3. The Role of the Press
4. Functions of the Press
5. Journalism as a Career
6. Qualification of a Successful Journalist

UNIT-III PRINT MEDIA

1. What is News?
2. Collecting the Fact
3. Reporting the News
4. Editing the News
5. How to write Headlines
6. The News Editor
7. The Sub-Editor

UNIT-IV REPORT WRITING

1. The Reporter
2. The Chief Reporter and other Correspondents
3. The News Editor
4. Feature Writing
5. Writing for the Magazines
6. The Freelance Journalist

UNIT-V ELECTRONIC MEDIA

1. Radio
2. Television
3. The Internet
4. Writing for Radio and Television

Prescribed Texts

1. Vir Aggarwal & V.S.Gupta., **Handbook of Journalism and Mass Communication**, Concept Publishing Company, New Delhi.
2. Puri. G.K. **Competition Success: Review Communication** . New Delhi: Sudha Publication,
3. Roy, Baron, **Beginner's Guide to Journalism**, New Delhi: Pushtak Mahal, 2003.
4. Parthasarathy,Rangaswami, **Basic Journalism**,Macmillan Publications,New Delhi,1984 Print.

SEMESTER V
ELECTIVE PAPER 1
TECHNIQUES OF TRANSLATION

Unit I

PERSPECTIVES ON TRANSLATION:

Definition of Translation

Equivalence: semantic and stylistic

Rules: description and prescription

Unit II

DEFINITION OF A TRANSLATOR:

Memory, meaning and language

The communication process

The translation process

Unit III

TRANSLATION THEORY:

Theories, models and analogies

Requirements for a theory of Translation

Methodology; Investigating translation

Unit IV

TRANSLATING: MODELLING THE PROCESS

The Translator: Knowledge and Skills

Ideal: Bilingual competence – Expertise - Communicative competence

Unit V

TRANSLATING: THE MODEL

components and processes – Analysis – synthesis

Using the process to translate

Analysis: reading the source language text

Preparation to Translate

Synthesis: writing the target translation text

Prescribed text:

Bell, Roger T. Translation and Translating: Theory and Practice. UK: Longman Group. 1991

https://pandoraenglish.files.wordpress.com/2012/11/ebooksclub-org__translation_and_translating__theory_and_practice__applied_linguistics_and_language_study_.pdf

SEMESTER V
SKILL BASED SUBJECT - PAPER 3
CONVERSATIONAL ENGLISH

Unit I

Greeting
Introducing
Inviting someone
Making requests
Seeking permission
Persuading

Unit II

Compliments/Congratulating
Expressing sympathy
Complaining
Apologising
Starting a conversation with a stranger
Ending a conversation

Unit III

Asking for Information
Asking someone to say something again
Checking that you have understood
Asking if someone is able to do something

Unit IV

At the Doctor's
At the bank
Railway enquiry
Looking for Accommodation
In a Government office
At the Greengrocer's

Unit V

Invitation to a party
Talking about a vacation
Seeking admission in a school
Asking about a course
Selling a Product
Getting a book published
An Interview

Prescribed Texts:

Spoken English For You Level 1, Radhakrishna Pillai G, KRajeevan. Emerald Publishers, Chennai
Spoken English For You Level 2, Radhakrishna Pillai G, Emerald Publishers, Chennai

SEMESTER VI

PAPER - 13 - SHAKESPEARE

Objectives:

- To enable the students to read the plays in the light of the critical approaches that has emerged prominent.
- The students will be enabled to review the traditional concepts of genre such as the Tragedy and the Romantic comedy etc.

UNIT I (Detailed Study)

: Macbeth

UNIT II (Detailed Study)

: As You Like It

UNIT III (Non-detailed Study)

The Tempest

UNIT IV SHAKESPEARE CRITICISM I (Non-detailed Study)

Thomas Dequincey : On the Knocking at the gate in Macbeth

(A Book of English Essays. Penguin Books, New Delhi 1992)

William Hazlitt

: Character of Shakespeare's Plays

1. Macbeth
2. As You Like It
3. The Tempest

UNIT V SHAKESPEARE CRITICISM II (Non-detailed Study)

Nevill Coghill

: The Basis Of Shakespearian Comedy

Part-III: As Shakespeare matured in comedy...
the first modification of Vincent's formula for
comedy

W.H. Auden

: Music in Shakespeare Part VII: Ariel's songs in The
Tempest...a place where silence shall be all.

From Ridler, Anne. *Shakespeare Criticism: 1935-60*. OUP, London. 1965

Books for Study and Reference

Hazlitt, William .*Characters of Shakespeare's Plays*. Oxford University Press, London.1966

Ridler,Anne. *Shakespeare Criticism: 1935-60*. Oxford University Press, London.1965

Charlton H.B. *Shakespearian Comedy*.Methuen & Co.Ltd. London 1969.

Wells, Stanley and Lena Cowen Orlin, *Shakespeare: An Oxford Guide*. Oxford University Press 2003 Newyork.

Edwards, Philip. *Shakespeare and the confines of Art* Methuen & CO.LTD London 1972.

Clemen,Wolfgang. *Shakespeare's Dramatic Art* –Methuen & CO.LTD London 1972.

Dover, John Wilson The Essential Shakespeare –Cambridge University Press 1967 Bennett H.S. Studies in Shakespeare - Oxford University Press 1964 London.

Smith,Emma..The Cambridge Shakespeare Guide, plots, characters and Interpretations. Cambridge University Press.

Rosen,Joseph Blum Ed The Greenwood Companion to Shakespeare. Volume I,II,III,IV Atlantic Publishers – New Delhi 2007.

Kurian,Anna.ed., *Shakespeare*. Orient BlackSwan, 2016

Shakespeare,William. *Macbeth*.The Arden Shakespeare ed., Sandra Clerk and Pamela Mason Bloomsbury,New Delhi. 2015

Shakespeare,William. *A Midsummer Night's Dream*.The Arden Shakespeare ed., Harold F.Brooks Bloomsbury,New Delhi. 2013

SEMESTER VI

PAPER - 14 - BRITISH LITERATURE V

Objectives:

- To give the students knowledge of the literary accomplishments and an exposure to twentieth century writers.
- To familiarize them with the writers of the modern era.

UNIT I: POETRY (Detailed Study)

W. B. Yeats : The Lake Isle of Innisfree

Philip Larkin : Church Going

Wilfred Owen : Insensibility

UNIT II: PROSE (Detailed Study)

George Orwell : Why I Write

D.H. Lawrence : Why the Novel Matters

UNIT III: DRAMA (Detailed Study)

T.S.Eliot : Murder in the Cathedral

UNIT IV: POETRY (Non-Detailed Study)

Dylan Thomas : Fern Hill

W. H. Davis : Leisure

UNIT V

DRAMA

J.M. Synge : Riders to the Sea

FICTION

E. M. Foster : A Passage to India

Virginia Woolf : To the Lighthouse

Books for Study and Reference

David, Green. *The Winged Word*. London: Macmillan, 1974

Viswanathan, Gauri. *Masks of conquest: Literary Study and British Rule in India*. OUP, 1998

Sherry, Vincent, ed. *The Cambridge Companion to the Literature of the First World War*. CUP, 2005

Mukherjee, Sipra. *Literary Contexts: Modern English Literature 1890-1960*. Orient BlackSwan, 2016

Web Resources

Literary Texts – Prose, Poetry and Fiction:

<<http://www.library.utoronto.ca/utel/works.html>>

George Orwell – Why I write –Text:

<http://orwell.ru/library/essays/wiw/english/e_wiw>

SEMESTER VI

PAPER -15 -NEW LITERATURES IN ENGLISH

UNIT I: POETRY

Derek Walcott : A far Cry from Africa
Pablo Neruda : Tonight I can write...
Margaret Atwood : Journey to the Interior

UNIT II: DRAMA

Wole Soyinka : The Lion and the Jewel

UNIT III: SHORT STORIES

Gabriel Garcia Marquez : The Handsomest Drowned Man in the World
Nadine Gordimer : Once Upon a Time
Katherine Mansfield : Miss Brill
Isabel Allende : And of Clay re We Created

UNIT IV: PROSE

Ngugi Wa Thiong'o : On the Abolition of the English Department
Thomas B. Macaulay : Minute on Indian Education

UNIT V: FICTION

Chinua Achebe : Things Fall Apart

Books for Study and Reference

Texts and their worlds II.ed., K Naryan chandran. Foundation Books.,Chennai,2005

Ed. Nasta, Susheila. *Writing Across Worlds*. London: Routledge.2004

Punter, David. *Postcolonial Imaginings: Fictions of a New World Order*. Atlantic: New Delhi. 2005.

SEMESTER VI
ELECTIVE PAPER 2 -
TECHNOLOGY MEDIATED ENGLISH

Unit 1:

1. World Wide Web & Email: WWW FAQ'S : Email, Internet
2. Searching the Internet & Search FAQ's
3. The Internet as Resource Bank and classroom tool
4. E.Mail Projects and Discussion Lists

Unit 2:

1. Introduction to NET (I)
2. Introduction to NET (II)

Unit 3:

1. Strange news
2. Making news
3. Eco-tourism

Unit 4:

1. Writing Projects
2. Online groups
3. Blogs and Wikis
4. Email projects and discussion lists

Unit 5:

1. A good book
2. Puzzle maker
3. web quest
4. Professional development online

Prescribed Text

The Internet and the Language Classroom – A Practical Guide for Teachers – II
Edition – Gavin Dudency , Cambridge University Press, 2007.

SEMESTER VI
ELECTIVE - PAPER 2
BUSINESS ENGLISH

UNIT I

1. Introduction to Business Communication
2. Communication in Organizations

UNIT II

1. Non- Verbal Communication
2. Effective Listening

UNIT III

1. Making presentations
2. Audio - Visual Aids
3. E-Mail Communication

UNIT IV

1. Resumes and cover letters
2. Preparing an Effective cv
3. Group Discussions
4. Interview Techniques

UNIT V

1. Memos, Reports, Proposals
2. Note taking, Note making
3. Inter cultural communication

Books for Study and Reference

N. Krishnaswamy, Manju Dariwal, Lalitha Krishnaswamy.

Mastering communication and soft skills: A Learner's Guide to Life Skills.
Bloomsbury. 2015

Om P. Juneja and Aarti Mujumdar Business Communication: Techniques and
Methods (Hyderabad: Orient Blackswan Private Limited, 2010).

Sanghita Sen , Alankrita Mahendra , Priyadarshi Patnaik.

Communication & language skills. Cambridge University Press India.2015

SEMESTER VI

ELECTIVE PAPER - 3 COPY EDITING AND PROOF READING

UNIT I: INTRODUCTION TO COPY EDITING

1. What is copy editing?
2. Type Scripts: Hard copy, Electronic and Camera ready
3. Type Scripts corrected by the author
4. Copy editing on Screen

UNIT II: PREPARING THE TEXT FOR THE TYPE SETTER

1. Various legal aspects
2. A well organized and consistent book
3. Copy right permissions and acknowledgements

UNIT III: ILLUSTRATIONS AND PROOFS

1. How to read proofs
2. How to make corrections
3. Colour coding corrections
4. The author's corrected proof
5. After passing proofs for Press

UNIT IV: HOUSE STYLE

1. House Style and Preliminary Pages
2. Cross – references
2. Date and Time
3. Spelling and Punctuation
4. Title page
5. Contents List
6. List of Illustrations

UNIT V: OTHER PARTS OF A BOOK AND LITERARY MATERIAL

1. Running Heads
2. Page numbers
3. Headings
4. Footnotes and Endnotes
5. Tables
6. Appendixes
7. Glossaries

Prescribed Text:

“Butcher's copy Editing” – Fourth Edition – Judith Butcher, Caroline Drake and Marseen Leach – CUP.

SEMESTER VI
ELECTIVE PAPER -3
EFFECTIVE COMMUNICATION

UNIT I- JUST A MINUTE

Planning a speech- Beginning a speech-Transitions-Closing statements- Body language- Voice modulation- Practising a speech- Effective Communication

UNIT II- WRITING SKILLS

Features of good writing – Gathering ideas – Purposes of writing – Writing for a specific audience – Organising ideas – Writing an introduction

UNIT III- CRITICAL THINKING SKILLS

Developing support ideas- Writing a conclusion – Using linkers – Choosing the right words – Common errors in writing – Editing and proofreading

UNIT IV- GROUP DISCUSSION

Group discussion as a tool for selection- Skills for group discussion- Leadership and problem solving skills- Types of group discussions- Group dynamics- Roles and functions: beginning, presenting, elaborating- Roles and functions: agreeing/disagreeing and summarising- Etiquette, body language and time management- group discussion activities

UNIT V- CRITICAL THINKING SKILLS

Reasoning- Analysis- Making an argument- Evaluating an argument- Evaluating alternative points of view- Synthesising and making connection- Interpreting information- Thinking about experiences- Problem solving- Thinking out of the box.

Prescribed Book

Mukhopadhyay, Lina *et al.* Polyskills: *A course in communication skills and life skills*. New Delhi: Cambridge University Press India Pvt. Ltd., 2012.

SEMESTER VI

SKILL BASED SUBJECT - PAPER 4 ENGLISH LANGUAGE TEACHING

UNIT I

Problems & prospects for the teacher of English.

What is involved in teaching English?

UNIT II

The content of the teaching of English

Strategies of techniques for the teacher

Planning the lesson

Methods & Techniques for Teaching

English in large classes- prose

UNIT III

Teaching reading skills: poetry

UNIT IV

Teaching of grammar & Composition

Examinations in English

UNIT V

Non- Verbal Presentation skills

Public speaking & presentation skills

Preparing for Interview

Books for Study and Reference

1. Bright . Mc. Gregor : Teaching English as a second language (Longman)
2. Spring Board to success: Sharada Kaushik Bindu Bajwa
3. Gosh, Sastrie, Dass : Introductions to English Language Teaching vol:3 CIEFL(oup)
4. Nagaraj, Geetha. English Language Teaching. Delhi, Orient Blackswan Private Limited, 2010.
5. Saraswathi. V. English Language Teaching, Principles and Practice. Chennai, Orient Longman, 2004.
6. Willis, Jane. Teaching English Through English. Hong Kong, Sing Cheong Printing co. Ltd, 1984.

THIRUVALLUVAR UNIVERSITY

**B.Sc. (Mathematics)
Curriculum & Syllabus
2017 – 2018 onwards**

| Sl. No. | Content | Page No. |
|----------------|--|-----------------|
| 1. | The Course of Study and the Scheme of Examinations | 2 |
| 2. | Core Subjects | 6 |
| 3. | Elective Subjects | 34 |
| 4. | Skill based subjects | 44 |
| 5. | Non-Major subjects | 47 |
| 6. | Allied subjects | 49 |

**THIRUVALLUVAR UNIVERSITY
B.Sc. MATHEMATICS
SYLLABUS
CBCS PATTERN**

(For the candidates admitted from 2017 - 2018)

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|-----------------------|-------------|----------------------|--------|---|---------------|--------------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper - 1 | 5 | 3 | Algebra | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper –2 | 4 | 3 | Trigonometry | 25 | 75 | 100 |
| 5 | III | ALLIED -1 (Theory) | Paper-1 | 7 | 4 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-3 | 5 | 3 | Calculus | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-4 | 4 | 3 | Analytical Geometry of three dimensions | 25 | 75 | 100 |
| 11 | III | Allied 2 Theory | Paper-2 | 4 | 4 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 12 | III | Allied 1 Practical | Practical 1 | 3 | 2 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 13 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 14 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------------|------------------|----------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| | | | | 30 | 23 | | 200 | 600 | 800 |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 15 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 16 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-5 | 6 | 4 | Differential Equations | 25 | 75 | 100 |
| 18 | III | Allied – 2 Theory | Paper – 3 | 7 | 4 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 19 | IV | Skill Based Subject | Paper – 1 | 3 | 3 | Linear Programming | 25 | 75 | 100 |
| 20 | IV | Non- major Elective | Paper – 1 | 2 | 2 | Basic Mathematics | 25 | 75 | 100 |
| | | | | 30 | 21 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 21 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-6 | 6 | 4 | Vector Analysis and Fourier analysis | 25 | 75 | 100 |
| 24 | III | Allied – 2 Theory | Paper – 4 | 4 | 4 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 25 | III | Allied – 2 Practical | Practical – 2 | 3 | 2 | (to choose any 1 out of 4) (For Practical Allied subjects) | 25 | 75 | 100 |
| 26 | IV | Skill Based Subject | Paper -2 | 3 | 3 | Mathematics for competitive Examinations – I | 25 | 75 | 100 |
| 27 | IV | Non- Major | Paper-2 | 2 | 2 | Foundation Mathematics | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|---------------------|---------------|----------------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| | | Elective | | | | for Competitive Examinations - I | | | |
| | | | | 30 | 3 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 28 | III | Core Theory | Paper-7 | 5 | 4 | Abstract Algebra | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-8 | 5 | 4 | Real Analysis - I | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper – 9 | 5 | 4 | Complex Analysis - I | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper – 10 | 5 | 4 | Statics | 25 | 75 | 100 |
| 32 | III | Core Theory | Paper – 11 | 4 | 4 | Dynamics | 25 | 75 | 100 |
| 33 | III | Elective | Paper-1 | 3 | 3 | (to choose any 1 out of 2) 1. Graph Theory 2. Astronomy | 25 | 75 | 100 |
| 34 | IV | Skill Based Subject | Paper-3 | 3 | 3 | Mathematics for Competitive Examinations – II | 25 | 75 | 100 |
| | | | | 30 | 26 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 35 | III | Core Theory | Paper -12 | 5 | 4 | Linear Algebra | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper -13 | 5 | 4 | Real Analysis II | 25 | 75 | 100 |
| 37 | III | Core Theory | Paper -14 | 5 | 4 | Complex Analysis II | 25 | 75 | 100 |
| 38 | III | Core Theory | Paper -15 | 3 | 3 | Programming in C Language | 25 | 75 | 100 |
| 39 | III | Core Practical | Practical - 1 | 3 | 3 | Practical in C Language | 25 | 75 | 100 |
| 40 | III | Elective | Paper-2 | 3 | 3 | (to choose any 1 out of 2) 1. Operations | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------|------|----------------------|----------|----------------|--------|---|---------------|-----|-----|
| | | Course Title | | | | | | | |
| | | | | | | Research 2. Calculus of finite differences & Numerical Methods. (to be chosen only those students who have not taken numerical methods as allied subject) | | | |
| 41 | IV | Elective | Paper-3 | 3 | 3 | (to choose any 1 out of 2) 1. Special functions 2. Fuzzy Mathematics | 25 | 75 | 100 |
| 42 | IV | Skill Based Subject | Paper -4 | 3 | 3 | Mathematics for Competitive Examinations – III | 25 | 75 | 100 |
| 43 | V | Extension Activities | | 0 | 1 | | 100 | 0 | 100 |
| | | Total | | 30 | 27 | | 300 | 600 | 900 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|-----------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied Practical (Even Sem) | 2 | 2 | 4 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-7) | 55 | 100 | 1500 |
| | Core Practical | 1 | 2 | 2 | 100 | 100 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 43 | | 140 | | 4300 |

THIRUVALLUVAR UNIVERSITY

B.Sc. MATHEMATICS

SYLLABUS

CBCS PATTERN

(For the candidates admitted from 2017 - 2018)

SEMESTER I

PAPER - 1

ALGEBRA

Objectives

In this Course students are exposed to topics like Theory of Equations, Summation of Series, Matrices, Continued Fractions and Elementary Number Theory. The stress is on the development of problem solving skills.

UNIT-I: THEORY OF EQUATIONS

Polynomial Equations - Symmetric Functions of roots in terms of Coefficients - Reciprocal Equations - Transformation of Equations.

UNIT-II: THEORY OF EQUATIONS (Contd...)

Descartes Rule of Signs - Approximate Solutions of Polynomials by Horner's method - Newton - Raphson method of Solution of a Cubic Polynomial.

UNIT-III: SUMMATION OF SERIES

Summation of series using Binomial - Exponential and Logarithmic series (Theorems without proofs) - Approximation using Binomial & Exponential series and logarithmic series simple problems.

UNIT-IV: MATRICES

Symmetric - Skew symmetric, - Hermitian - Skew Hermitian - Orthogonal and Unitary Matrices - Cayley-Hamilton Theorem (without proof) - Eigen Values - Eigen Vectors–Similar Matrices - Diagonalisation of a Matrix.

UNIT-V: ELEMENTARY NUMBER THEORY

Prime Number - Composite Number - Decomposition of a Composite Number as a Product of Primes uniquely (without proof) - Divisors of a Positive Integer - Congruence Modulo n - Euler Function (without Proof) - Highest Power of a Prime Number p contained in $n!$ - Fermat's and Wilson's Theorems (statements only) - simple problems.

Recommended Texts

T.K.ManicavachagomPillay, T.Natarajan and K.S.Ganapathy.(2004) *Algebra*, Volume I & II S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

1. P.Kandasamy, K.Thilagavathy (2004), Mathematics for B.Sc. Vol-I, II, III & IV, S.Chand& Company Ltd., New Delhi-55.
2. S.Arumugam (2003) *Algebra*. New Gamma Publishing House, Palayamkottai.
3. A.Singaravelu (2003) *Algebra and Trigonometry*, Vol.-I & II Meenakshi Agency, Chennai.
4. S.Sudha(1998) *Algebra and Trigonometry*. Emerald Publishes, Chennai.

PAPER - 2
TRIGONOMETRY

Objectives

This course is a fundamental one for many courses of this Degree Programme. This covers topics on the expansions of trigonometric functions, hyperbolic functions, inverse circular, inverse hyperbolic functions and it aims to develop computational skills.

UNIT-I

Expansions of $\cos n\theta$, $\sin n\theta$ - Expansion of $\tan n\theta$ in terms of $\tan \theta$ - Expansion of $\tan(A+B+C+\dots)$ - Formation of Equations. Chapter III section 1 to 3

UNIT-II

Powers of sines and cosines of θ in terms of functions of multiples of θ - expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ - Expansion of Inverse Circular Functions. Chapter III section 4 and 5

UNIT-III: Hyperbolic Functions

Definition – Relation between Hyperbolic Functions - Inverse Hyperbolic Functions. Chapter IV sections 1 to 2.3

UNIT-IV

Resolution into Factors - simple problems only - DeMoivre's Property on the Circle and Cote's Property on the Circle. Logarithm of complex quantities.

Chapter V sections 2 and 3 (Problems only)

Chapter V sections 4, 4.1, 4.2, 5, 5.1, 5.2...

UNIT-V

Summation of Trigonometric Series: When the angles are in A.P, C+iS method of summation - Method of Differences - Gregory Series - Euler Series.

Chapter VI section 1, 2, 3, 3.1, 3.2.

Recommended Text

1. S.Narayanan and T.K.Manicavachagom Pillay (2004) *Trigonometry*. S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

1. P.Kandasamy, K.Thilagavathy (2004), Mathematic for B.Sc. Vol.-I, II, III & IV, S.Chand& Company Ltd., New Delhi-55.
2. S.Duraipandian and LaxmiDuraipandian (1984) *Trigonometry*. Emerald Publishers, Chennai.
3. B.S.Grewal. (2002) *Higher Engineering Mathematics*. Khanna Publishers. New Delhi.
4. S.L.Loney. (1982) *Plane Trigonometry*, Part II, Cambridge University Press, London.
5. A.Singaravelu (2003) *Algebra and Trigonometry*, Vol.-I Meenakshi Agency, Chennai.
6. P.R.Vittal. (2004) *Trigonometry*, Margham Publications, Chennai.

SEMESTER II

PAPER - 3

CALCULUS

Objectives

The course introduces students to the fundamental principles, concepts and knowledge in the areas of Differential and Integral Calculus. This prepares the students to apply these fundamental concepts and working knowledge to other courses.

UNIT-I

Differential Calculus: n^{th} derivative - Leibnitz's theorem (Without proof) and its application - Jacobians - Total differential - maxima and minima functions of 2 & 3 independent variable, Lagrange's method (without proof), problems on this concepts.

UNIT-II: Differential Calculus (Contd...)

Polar coordinates – Angle between radius vector and tangent – Angle between two curves, Curvature, Radius of Curvature in Cartesian and Polar coordinates, p-r equation, Evolutes.

UNIT-III: Differential Calculus (Contd...)

Asymptotes: Methods (without proof) of finding asymptotes of rational algebraic curves with special cases.(First 5 sections only)

UNIT-IV: Integral Calculus

Reduction formulae, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \sin^m x \cos^n x dx$, Beta and Gamma Functions - Properties and Problems.

UNIT-V: Integral Calculus (Contd...)

Double Integrals - Change of order of Integration - Triple Integrals - Applications to Area, Surface Area and Volume.

Recommended Text

S.Narayanan and T.K.Manicavachagom Pillay (2004) *Calculus*. S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

1. P.Kandasamy, K.Thilagavathy (2004), Mathematic for B.Sc. Vol.-I, II, III & IV, S.Chand& Company Ltd., New Delhi-55.
2. Shanti Narayan (2001) *Differential Calculus*. Shyamlal Charitable Trust, New Delhi.
3. Shanti Narayan (2001) *Integral Calculus*.S.Chand& Co. New Delhi.
4. S.Sudha (1998) *Calculus*. Emerald Publishers, Chennai.
5. G.B.Thomas and R.L.Finney. (1998) *Calculus and Analytic Geometry*, Addison Wesley (9thEdn.), Mass. (Indian Print)
6. P.R.Vittal. (2004) *Calculus*, Margham Publication, Chennai.

PAPER - 4

ANALYTICAL GEOMETRY OF THREE DIMENSIONS

Objective:

To deepen the knowledge of the students in various concepts of Analytical Solid Geometry.

Unit I: Plane

General equation of a plane – Equation of a plane in the normal form – Angle between planes – Plane through three given points – Equation of a plane through the line of intersection of two planes.

UNIT II: Straight Line

Symmetrical form of a straight line – Image of a point with respect to a plane – Image of a line with respect to a plane – Length and equation of the shortest distance between two skew lines - Coplanar lines.

UNIT III: Sphere

Equation of the sphere – Length of the tangent – Tangent plane – Section of a sphere by a plane – Orthogonal spheres – Equation of a sphere through a given circle.

UNIT IV: Cone

Equation of a cone with a given vertex and a given guiding curve - Equation of a cone with its vertex at the origin - Condition for the general equation of the second degree to represent a cone - Right circular cone – Enveloping cone - Tangency of a plane to a cone.

UNIT V: Cylinder

Equation of a cylinder with a given generator and a given guiding curve - Right circular cylinder - Enveloping cylinder – Enveloping cylinder as a limiting form of an enveloping cone.

Recommended Text

T.K.Manickavachagom Pillay & others. (2004) *Analytical Geometry* (Three Dimensions)
S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

1. P.Duraipandian and LaxmiDuraipandian (1965) *Analytical Geometry-2D*, Asia Publishing company, Bombay
2. P.Duraipandian and LaxmiDuriapandian (1975) *Analytical Geometry-3 D*, Emerald Publishers, Chennai.
3. G.B.Thomas and R.L.Finney.(1998) *Calculus and Analytic Geometry*, Addison Wesley (9thEdn.), Mass. (Indian Print).
4. P.R.Vittal (2003) *Coordinate Geometry*. Margham Publishers, Chennai

SEMESTER III**PAPER - 5****DIFFERENTIAL EQUATIONS****Objectives**

This course aims to provide logical skills in the formation of differential equations, to expose to different techniques of finding solutions to these equations and in addition stress is laid on the application of these equations in geometrical and physical problems.

UNIT-I: Ordinary Linear Differential Equations

Bernoulli Equation – Exact Differential Equations – Equations Reducible to Exact Equations – Equations of First order and Higher degree: Equations solvable for p, Equation solvable for x and Equations Solvable for y – Clairaut's Equation.

UNIT-II: Ordinary Linear Differential Equations [Contd...]

Method of Variation of Parameters – 2nd order Differential Equations with Constant Coefficients for finding the P.I's of the form $e^{ax} V$, where V is $\sin(mx)$ or $\cos(mx)$ and x^n – Equations reducible to Linear equations with constant coefficients – Cauchy's homogeneous Linear Equations – Legendre's Linear Equations.

UNIT-III: Differential Equations of Other Types

Simultaneous Equations with Constant coefficients – Total Differential Equations
Simultaneous Total Differential Equations – Equations of the form $dx/P = dy/Q = dz/R$

UNIT-IV: Laplace Transform

Transform-Inverse Transform – Properties – Application of Laplace Transform to solution of first and second order Linear Differential equations [with constant coefficients].

UNIT-V: Partial Differential Equations

Formation of PDF – Complete Integral – Particular Integral – Singular Integral – equations Solvable by direct Integration – Linear Equations of the first order – Non-linear Equations of the first Order:

Types:

$$f[p,q]=0,$$

$$f[x,p,q]=0, \quad f[y, p, q]=0, \quad f(z, p, q)=0, \quad f[x, q]=f[y, p],$$

$$z=px+qy + f[p, q]$$

Recommended Text

S.Narayananand T.K.Manickavachagapillai[2004] Calculus S.Viswanathan Printers and publishers Pvt.Ltd.,Cheenai.

Reference Books

1. M.D. Raisinghania, [2001] Ordinary and Partial Differential Equations, S.Chand and Co., New Delhi.
2. M.R.Spiegel [2005] Advanced mathematics for Engineers and Scientists, Tata McGraw Hill Edition, New Delhi.
3. M.R.Spiegel [2005] Laplace Transforms, Tata McGraw Hill Edition, New Delhi.
4. S.Sudha [2003] Differential Equations and Integral Transforms, Emerald Publishers, Chennai.
5. M.K.Venkataraman [1998] Higher Engineering Mathematics, III-B, National Publishing Co., Chennai.
6. P.r.Vittal [2004] Differential Equations and Laplace Transform, Margham Publications, Chennai.
7. P.Kandasamy, K.Thilagarathy [2004] Mathematics for B.Sc. Vol. III S.Chand& Co., Ltd., New Delhi-55.
8. B.S.Grewal [2002] Higher Engineering Mathematics, Khanna Publishers, New Delhi.
9. Sheply. L.Ross [1984] Differential Equations, III Edition john Wiley and Sons, New York.

SKILL BASED SUBJECT

PAPER - 1

LINEAR PROGRAMMING

Objectives

To improve the skills of solving very common problems which we come across in various fields like transportation, games and industries with machines.

UNIT-I

Linear programming problem - Mathematical formulation of the problem - Graphical solution method - simple method - Duality - primal and dual relation (simple Problems).

UNIT-II

Transportation problem - Degeneracy in transportation problem.

UNIT-III

The Assignment problem – Travelling salesman method.

UNIT-IV

Game theory - two persons zero sum game - the maximin minimax principle - saddle points - games without saddle points.

UNIT-V

Simulation - application - advantages and disadvantages - Monte Carlo method - simple problems.

Recommended Text

Gupta P.K.and Hira D.S., (2000) Problems in Operations Research, S.Chand & Co. Delhi

Reference Books

1. Quantitative Aptitude - R.S. Aggarwal (S.Chand & Co - New Delhi 2008)
2. Quantitative Aptitude for Competitive Examinations – Abhigat Guha (Tata McGraw - Hill Pub., Co., Ltd. New Delhi - III Edn.,)
3. Course in Mental Abilities and Quantitative Aptitude for Competitive Examinations - Edgar Thorpe (Tata McGraw - Hill Pub., Co., Ltd. New Delhi - II Edn.,)
4. Statistic, RSN Pillai and A. Bagavathi, S.Chand & Co.,
5. Elements of statistics, Sivadanu Pillai.
6. Algebra, Manickavachakam Pillai & Narayanan

NON-MAJOR ELECTIVE

PAPER -1

BASIC MATHEMATICS

Objectives

To introduce a few basic and elementary concepts of mathematics for other major students.

UNIT-I: Sets

Definition - Subsets - Power sets - Equality of sets - Finite and Infinite sets - Set operations - De-Morgan's laws - Distributive tables - Cartesian products.

UNIT-II: Number system

Binary, octal, hexadecimal numbers - conversion from one system to another system - addition and subtraction - one's complement.

UNIT-III: Symbolic logics

Logical statements - connectives - truth tables - tautologies operations - groups – (problems and simple properties only).

UNIT-IV: Determinants

Definition - properties (without proof) - application of determinants - Cramer's rule for the solution of a system of equations

UNIT-V: Matrices

Definition - types of matrices - operations on matrices - adjoint and inverse - applications - solving non-homogeneous equations.

Recommended Texts

1. Dr.M.K.Venkataraman & others, "Discrete mathematics and structures", The National Publishing Company, Madras.
2. Trembly J.P and Manohar.R "Discrete Mathematical Structures with applications to computer science" Tata McGraw - Hill Pub., Co., Ltd. New Delhi 2003.

Reference Books

1. P.R.Vittal "Algebra, Analytical Geometry and trigonometry" Margham Publications, Chennai.
2. Richard Johnsonbaugh, "Discrete Mathematics" fifth Edn., Pearson Education Asia, New Delhi 2002.

SEMESTER-IV

PAPER-6

VECTOR ANALYSIS AND FOURIER ANALYSIS

Objectives

This course covers the topics in vector and tensor calculus which are essential tools of modern applied mathematics. To develop deep understanding of key concepts followed by problems of applied nature. The portion on Fourier analysis will lead to post-graduate studies and research in pure as well as applied mathematics.

UNIT-I: Differential Vector Calculus

Differentiation of a Vector - Geometrical Interpretation of the Derivative - Differentiation Formulae - Differentiation of dot and Cross Products - Partial Derivatives of Vectors - Differentials of Vectors.

UNIT-II: Gradient, Divergence and Curl

Vector Differential Operator Del - Gradient of a Scalar Function - Directional Derivative - Geometric Interpretation - Gradient of the sum of Functions; of the product of functions and of a function of function - Operations involving Del - Divergence of a Vector and its Physical Interpretation - Curl of a Vector and its Physical Interpretation - Expansion Formulae for Operators involving Del - Solenoidal and Irrotational.

UNIT-III: Vector Integration

The Line Integral - Surface Integral and its Physical Meaning – Volume integral. Simple problems.

UNIT-IV: Vector Integration(Contd.)

Statements of Stoke's Theorem, Gauss Divergence Theorem and Green's Theorem and problems.

UNIT-V: Fourier Series

Euler's Formulae - Conditions for Fourier Expansion - Functions having Discontinuity - Change of Interval - Odd and Even Functions - Expansions of Odd or Even periodic Functions - Half-range Series-Typical Wave Forms - Parseval's Formula.

Recommended Text

P.R.Vittal. (2004) *Vector Calculus, Fourier series and Fourier Transform*. Margham Publications, Chennai.

Reference Books

1. G.B.Thomas and R.L.Finney. (1998) *Calculus and Analytic Geometry*, Addison Wesley (9th Edn), Mass. (Indian Print).
2. M.K.Venkataraman. (1992) *Engineering Mathematics-Part B*. National Publishing Company, Chennai.
3. B.S.Grewal. *Higher Engineering Mathematics* (2002), Khanna Publishers, New Delhi.

SKILL BASED SUBJECT

PAPER - 2

MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I

Objectives

To introduce concepts of mathematics with emphasis on analytical ability and computational skill needed in competitive examinations.

Unit- I

Numbers, H.C.F. and L.C.M. of numbers, Decimal Fractions.

Unit -II

Simplification, Square roots and Cube Roots, Average.

Unit- III

Problems on numbers, problems on Ages.

Unit -IV

Surds and Indices, Percentage, Profit and Loss.

Unit -V

Ratio and Proportion, Partnership.

Text Books:-

1. Quantitative Aptitude for competitive Examination, R.S.Aggarwal. S.Chand and company Ltd, 152, Anna salai, Chennai. (2001)
2. Quantitative Aptitude and Reasoning Praveen PHI P. Ltd.

NON-MAJOR ELECTIVE

PAPER -2

FOUNDATION MATHEMATICS FOR COMPETITIVE EXAMINATIONS

Objectives

To introduce concepts of mathematics with emphasis on analytical ability and computational skill needed in competitive examinations.

UNIT-I

Ratio and proportions

UNIT-II

Percentages

UNIT-III

Profit and loss, discounts.

UNIT-IV

Simple and compound interest.

UNIT-V

Time, Distance and Work

Recommended Text book:

Quantitative Aptitude - R.S. Aggarwal (S. Chand & Co. - New Delhi 2008)

SEMESTER - V
PAPER - 7
ABSTRACT ALGEBRA

Objectives

This course aims to impart emphasis on concepts and technology of the groups and rings as these algebraic structures have applications in Mathematical Physics, Mathematical Chemistry and Computer Science.

UNIT-I: Groups

Definition of a Group - Examples - Subgroups;

UNIT-II: Groups (Contd)

Counting Principle - Normal Subgroups - Homomorphisms.

UNIT-III: Groups (Contd)

Automorphisms - Cayley's Theorem - Permutation Groups.

UNIT-IV: Rings

Definition and Examples - Integral Domain - Homomorphism of Rings - Ideals and Quotient Rings.

UNIT-V: Rings (Contd)

Prime Ideal and Maximal Ideal - The field of quotients of an Integral domain – Euclidean rings.

Recommended Text

I.N.Herstein (1989), Topics in Algebra, (2nd Edn.)Wiley Eastern Ltd. New Delhi

Chapter-2: Sections 2.1-2.10 (Omit Applications 1 and 2 of 2.7)

Chapter-3: Sections 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7

Reference Books

1. S.Arumugam. (2004) *Modern Algebra*. Scitech Publications, Chennai.
2. J.B.Fraleigh (1987). *A First Course in Algebra* (3rd Edition) Addison Wesley, Mass. (Indian Print)
3. Lloyd R.Jaisingh and Frank Ayres,Jr. (2005) *Abstract Algebra*, (2nd Edition), Tata McGraw Hill Edition, New Delhi.
4. M.L.Santiago (2002) *Modern Algebra*, Tata McGraw Hill, New Delhi.
5. Surjeet Singh and QaziZameeruddin. (1982) *Modern Algebra*. Vikas Publishing House Pvt. Ltd. New Delhi.

PAPER - 8
REAL ANALYSIS I

Objectives

To understand various limiting behavior of sequences and series

To explore the various limiting processes viz. continuity, uniform continuity, differentiability and integrability and to enhance the mathematical maturity and to work comfortably with concepts.

UNIT-I: Functions & Sequences

Functions – real valued functions – equivalence – countability and real numbers – least upper bound – definition of sequence and subsequence – limit of a sequence – convergent sequence
Ch. 1.4 to 1.7, 2.1 to 2.3 of Goldberg.

UNIT-I: Sequences [Contd...]

Divergent sequences – Bounded sequences – Monotone sequence – Operations on convergent sequences – Operations on divergent sequences – Limit superior and Limit inferior – Cauchy sequences
Ch. 2.4 to 2.10 of Goldberg.

UNIT-III: Series of Real Numbers

Convergence and Divergence – Series with non negative terms – Alternating series – conditional convergence and Absolute convergence – Test for Absolute convergence.
Ch. 3.1 to 3.4 and 3.6 of Goldberg.

UNIT-IV: Series of Real Numbers [Contd...]

Test for Absolute convergence – The class ℓ^2 – Limit of a function on the real line – Metric spaces – Limits in Metric spaces.
Ch. 3.7, 3.10, 4.1 to 4.3 of Goldberg.

UNIT-V: Continuous Functions on Metric Spaces

Functions Continuous at a point on the real line – Reformulation – Functions Continuous on a Metric Spaces – Open Sets – Closed Sets.
Ch. 5.1 to 5.5 of Goldberg

Recommended Text

R.Goldberg [2000] Methods of Real Analysis. Oxford & IBH Publishing Co., New Delhi.

Reference Books

1. Tom M.Apostol [1974] Mathematical Analysis, 2nd Edition, Addison-Wesley New York.
2. Bartle, R.G. and Shebert [1976] Real Analysis, John Wiley and Sons Inc., New York.
3. Malik, S.C. and SavitaArora [1991] Mathematical Analysis, Wiley Eastern Limited, New Delhi.
4. Sanjay Arora and Bansilal [1991], Introduction to Real Analysis, SatyaPrakashan, New Delhi.

PAPER - 9
COMPLEX ANALYSIS - I

Objectives

This course provides

- (i) a modern treatment of concepts and techniques of complex function theory
- (ii) To gain knowledge about the complex number system, the complex function and complex integration.

UNIT-I: Complex numbers and Elementary functions

Complex Number system, complex numbers –Algebraic properties-Point at Infinity Stereographic Projection-Function of a complex variable-Mappings-Elementary Functions- The Logarithmic function- Branches of $\log Z$.
Sections 1-10, 21-30.

UNIT-II: Analytic functions

Definitions of Limits -Continuity-Derivatives and Differentiation formula-Cauchy-Riemann equations-Cauchy-Riemann equations in polar form-properties of Analytic functions-Necessary and sufficient conditions for Analytic functions-problems. Sections 11-19.

UNIT-III: Conformal Mappings

Harmonic functions-Determination of Harmonic conjugate and Analytic functions-conformal mapping-Isogonal mapping-Further properties and examples-transformations of Harmonic functions.
Sections 20, 76-80.

UNIT-IV Mapping by Elementary transformations

The transformations $w=z+d$, $w=1/z$, $w=z^2$, $\bar{w}=\sqrt{z}$, $w=e^z$, $w=\sin z$ Bilinear Transformation and special Bilinear Transformation problems.
Sections 31-36, 38-39

UNIT-V: Integrals

Contours - Line Integrals _ Cauchy-Goursat's Theorem (without proof) Cauchy's Integral Formula - Derivatives of Analytic Functions - problems. Sections 43-46, 50-52.

Recommended Text

R.V.Churchill and J.W.Brown, (1984) *Complex Variables and Applications*. McGraw Hill International Book Co., Singapore. (Third Edition)

Reference Books:

1. P. Duraipandian and LaxmiDuraipandian (1976) *Complex Analysis*: Emerald Publishers, Chennai
2. S. Ponnusamy. (2000) *Foundations of Complex Analysis*, Narosa Publishing House, New Delhi
3. Murray R. Spiegel. (2005) *Theory and Problems of Complex Variable*. Tata-Mcgraw Hill Edition, New Delhi.

PAPER - 10

STATICS

OBJECTIVES

This course introduces the students the basic concepts of forces, moments, couple, friction law virtual displacement and work, catenary and the centre of gravity and kinematics. This course stresses the development of skills in formation of suitable mathematical models and problems solving techniques.

UNIT- I

Forces, Type of forces- Resultant of three forces related to triangle acting at a point - Resultant of several forces acting on a particle - Equilibrium of a particle under three forces - Equilibrium of a particle under several forces - Limiting Equilibrium of a particle on an inclined plane.

UNIT- II

Moment of a forces- General motion of a Rigid body- Equivalent system of forces – Parallel forces- Forces along the sides of the triangle.

UNIT- III

Couples- Resultant of several coplanar forces – Equation of line of action of the resultant – Equilibrium of a rigid body under three coplanar forces.

UNIT - IV

Reduction of coplanar forces into a force and a couple – Friction – laws of friction – cone of friction and angle of friction – Applications involving frictional forces.

UNIT - V

Center of mass – Center of mass of a triangular lamina – Three particles of same mass - Three particles of certain masses – uniform rods forming a triangle – lamina in the form of a trapezium and solid tetrahedron – Center of mass using integration – circular arc – circular lamina – elliptic lamina – solid hemisphere – solid right circular cone – hemispherical shell – hollow right circular cone.

Recommended Text

P. Duraipandian, LaxmiDuraipandian ,MuthamizhJayapragasam, Mechanics, 6-e,
S. Chand and Company Ltd, 2005.

Reference Books

1. S. Narayanan, R. HanumanthaRao, K. Sitaraman, P. Kandaswamy, *Statics*, S. Chand and Company Ltd, New Delhi.
2. S. L. Loney, *An Elementary Treatise on Statics*, Cambridge University Press, 1951
3. A.V. Dharmapadam(1991) *Mechanics*. S. Viswanathan Printers & Publishers. Chennai.
4. M.K. Venkataraman (1990) *Statics*. A Rajhans Publications. (16thEdn), Meerut.
5. Joseph F. Shelley (2005) *Vector Mechanics for Engineers Vol-I: Statics*, Tata McGraw Hill Edition, New Delhi.

PAPER - 11

DYNAMICS

OBJECTIVES

This course aims to provide models for some real life problems. This covers topics like Simple Harmonic Motion, Projectiles, Central Orbits and Moment of Inertia. Stress is on the mathematical formulation of the physics aspects of the problems and it develops logical deduction and interpretation.

UNIT- I

Velocity, Relative Velocity, Angular Velocity, Acceleration, Rectilinear motion, Rectilinear motion with constant acceleration, Relative angular velocity, Work, Power, Energy.

UNIT- II

Motion of a projectile, Nature of a trajectory, Results pertaining to the motion of a projectile, Range on an inclined plane, Maximum range on the inclined plane. Simple problems.

UNIT -III

Impulsive force, Conservation of linear momentum, Impact of a sphere, Laws of impact, Impact of two smooth spheres, Direct impact of two smooth spheres, Direct impact of a smooth sphere on a plane, oblique impact of a smooth sphere on a plane. Simple problems.

UNIT- IV

Central force and Central Orbit, Equation of central orbit, finding law of force and speed for a given orbit, Determination of the orbit when law of force is given, Kepler's Laws on planetary motion. Simple Problems.

UNIT -V

Moment of Inertia of simple bodies, Theorems of parallel and perpendicular axes, Moment of inertia of triangular lamina, circular lamina, circular ring, right circular cone, sphere. Simple problems.

Recommended Text

P. Duraipandian, LaxmiDuraipandian ,MuthamizhJayapragasam, Mechanics, 6-e,
S. Chand and Company Ltd, 2005.

Reference Books

1. S. Narayanan, R. HanumanthaRao, K. Sitaraman, P. Kandaswamy, *Statics*, S. Chand and Company Ltd, New Delhi.
2. S. L. Loney, *An Elementary Treatise on Statics*, Combridge University Press, 1951
3. A.V. Dharmapadam(1991) *Mechanics*. S. Viswanathan Printers & Publishers. Chennai.
4. M.K. Venkataraman (1990) *Statics*. A Rajhans Publications. (16thEdn), Meerut.
5. Joseph F. Shelley (2005) *Vector Mechanics for Engineers Vol-I: Statics*, Tata McGraw Hill Edition, New Delhi.

ELECTIVE

PAPER - 1

A. GRAPH THEORY

Objectives

To study and develop the concepts of graphs, subgraphs, trees connectivity, Eulerian and Hamiltonian graphs, matching colorings of graphs and planar graphs

UNIT-I

Graphs, subgraphs, Degree of a vertex, Isomorphism of graphs, independent sets and coverings.

UNIT-II

Intersection graphs; Adjacency and incidence of matrices; Operations on graphs;;

UNIT-III

Walks; trails; paths; Connectedness and components; cut point, bridge, block.

UNIT-IV

Connectivity theorems and simple problems. Eulerian graphs and Hamiltonian graphs; simple problems

UNIT-V

Trees, theorems, and simple problems.

Recommended Text

S.Arumugam and S.Ramachandran, “Invitation to Graph Theory”, SITECH Publications India Pvt. Ltd., 7/3C, Madley Road, T.Nagar, Chennai - 17

Reference Books

1. S.Kumaravelu, SusheelaKumaravelu, Graph Theory, Publishers, 182, Chidambara Nagar, Nagercoil-629 002.
2. S.A.Choudham, A First Course in Graph Theory, Macmillan India Ltd.
3. Robin J.Wilson, Introduction to Graph Theory, Longman Group Ltd.
4. J.A.Bondy and U.S.R. Murthy, Graph Theory with Applications, Macmillon, London.

B. ASTRONOMY

Objectives

This course aims to provide working knowledge about the universe.

UNIT-I

Celestial Sphere - Diurnal motion - Simple Problems page 39 - 83 (Use the results 65,67,83,84) to solve problems.No derivation.)

UNIT-II

Zones of Earth - Terrestrial Latitudes and Longitudes - Rotation of Earth - Dip of the horizon - - Simple problems. Page 90-131 (Use the results of 96,99,102 to solve problems. No need for derivation.

UNIT-III

Twilight-simple problems-Astronomical refraction - Simple problems.page 131-157. (use the result of 124,125,126,127 to solve problems. No need to derive the result)

UNIT-IV

Kepler's Laws - simple problems page 172-189. (Use result s of 159,160 to solve the problems.No need to derive the results.

UNIT-V

Moon - phases of moon - Eclipses - Introduction - umbra and penumbra - lunar eclipse - solar eclipse - condition for the occurrence of lunar and solar eclipses. Page 334-377. (Use the results of 270,271,272 to solve problem, no need to derive the results)

Recommended Text

S.Kumaravelu and SusheelaKumaravelu.(2004) *Astronomy*. SKV Publishers, Nagarkoil

Reference Books

1. L.W.Frederick and R.H.Baker (1976) *Astronomy* (10thEdn) Vas Nostrand, New York.
2. R.Jastrow and M.H.Thompson (1984) *Astronomy : Fundamentals and Frontiers*, (4thEdn) John Wiley & Sons, New York.
3. H.Karttunen et. al. (2003) *Fundamental Astronomy* (4thEdn) Springer Verlag, Berlin.
4. L.Motz and A.Duveen. (1977) *Essentials of Astronomy* (2ndEdn) Columbia University Press, New York.
5. G.V.Ramachandran. (1965) *A Text Book of Astronomy* (5thEdn) Published by Mrs. RukmaniRamachandran, Tiruchirappalli
6. M.Zeilik (2002) *Astronomy: The Evolving Universe* (9thEdn) Cambridge University Press, Cambridge.

SKILL BASED SUBJECT

PAPER - 3

MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II

Unit- I

Chain rule –Time and work.

Unit- II

Time and Distance

Unit- III

Problems on Trains.

Unit- IV

Boats and Streams.

Unit- V

Alligation or Mixture.

Text Book:-

Quantitative Aptitude for competitive Examination R.S. Aggarwal. S. Chand and company Ltd,152,Anna salai, Chennai. 2001

SEMESTER VI

PAPER - 12

LINEAR ALGEBRA

Objectives

To study the Algebraic structures of Vector Spaces and Linear Transformation

UNIT-I: Vector Spaces

Definition and examples-Linear dependence and independence

UNIT-II: Vector Spaces (Contd)

Dual space - Inner Product spaces.

UNIT-III: Linear Transformation

Algebra of linear transformations - Characteristic roots

UNIT-IV: Linear Transformation (Contd)

Matrices, Canonical forms; Triangular forms.

UNIT-V: Linear Transformation (Contd)

Trace and Transpose, Determinants

Recommended Text

I.N.Herstein. (1989) *Topics in Algebra*. Wiley Eastern Ltd. New Delhi.

Chapter-4: Sections 4.1, 4.2, 4.3, 4.4,

Chapter-6: Sections 6.1, 6.2, 6.3, 6.4, 6.8, 6.9

Reference Books

1. S.Arumugam. (2004) *Modern Algebra*. Scitech Publications, Chennai.
2. J.B.Fraleigh (1986) *A First Course in Algebra* (3rd Edition) Addison Wesley. Mass. (Indian Print)
3. S.Lipschutz (2005) *Beginning Linear Algebra*, Tata McGraw Hill Edition, New Delhi.
4. M.L.Santiago. (2002) *Modern Algebra*, Tata McGraw Hill, New Delhi.
5. Surjeet Singh and Qazi Zameeruddin. (1982) *Modern Algebra*. Vikas Publishing House Pvt. Ltd., New Delhi, 1982

PAPER - 13

REAL ANALYSIS II

Objectives

To understand Integration process of Riemann

To develop the understanding of point wise and uniform convergence of sequence and series of functions.

To enhance the mathematical maturity and to work comfortably with concepts.

UNIT-I: Connectedness, Completeness

Open Sets – Connected Sets – Bounded Sets and Totally Bounded Sets – Complete Metric Spaces.

Ch. 6.1 to 6.4 of Goldberg

UNIT-II: Compactness

Compact Metric Space – Continuous Functions on Compact Metric Spaces - Continuity of Inverse Functions – Uniform Continuity.

Ch. 6.5 to 6.8 of Goldberg

UNIT-III: Riemann Integration

Sets of measure zero - Definition Riemann Integral – Properties of Riemann Integral – Derivatives.

Ch. 7.1, 7.2 7.4, 7.5 of Goldberg.

UNIT-IV: Riemann Integration [Contd...]

Rolle's Theorem – The law of mean – Fundamental theorems of calculus – Taylor's theorem.

Ch. 7.6 to 7.8 and 8.5 of Goldberg.

UNIT-V: Sequences and Series of Functions

Pointwise convergence of sequences of functions – Uniform convergence of sequences of functions – consequences of uniform convergence – Convergence and uniform convergence of series of functions.

Ch. 9.1 to 9.4 of Goldberg.

Recommended Text

R.Goldberg Methods of Real Analysis Oxford & IBH Publishing Co., New Delhi.

Reference Books

1. Tom M.Apostol [1974] Mathematical Analysis, 2nd Edition, Addison-Wesley Publishing Company Inc. New York.
2. Bartle, R.G. and Shebert [1976] Real Analysis, John Wiley and Sons Inc., New York,
3. Malik, S.C. and SavitaArora [1991] Mathematical Analysis, Wiley Eastern Limited, New Delhi.
4. Sanjay Arora and Bansilal [1991] Introduction to Real Analysis, Satya Prakashan, New Delhi.

PAPER - 14
COMPLEX ANALYSIS II

Objectives:

- (1) To gain knowledge about complex Integration and series.
- (2) This course provides methods to solve problems in pure as well as in applied mathematics.

UNIT-I: Integrals:

Morera's theorem- Maximum Moduli of functions- The fundamental theorem of Algebra- Liouville's theorem-convergence of sequences and series-uniform convergence. Sections 53-56, 61.

UNIT-II: Power series.

Taylor's and Laurent's theorem-Integration and differentiation of power series-problems. Sections 57-60.

UNIT-III: Singularities and Residues.

Singularities and classifications- Isolated singularities:Removable singularity Pole and essential singularity-Residues-Cauchy's Residue theorem-problems. Sections 67-71.

UNIT-IV: Analytic continuation

Conditions under which $f(z) \neq 0$ -Uniqueness-Singular points:Poles and zeros-Essential singular points-Number of zeros and poles-The Argument principle. Sections 106 -114.

UNIT V: Contour Integration

Evaluation of Improper Real Integrals-Improper integrals involving Trigonometric functions -Integration around a Branch point. Sections 72-75.

Recommended Text

R.V.Churchill and J.W.Brown, (1984) *Complex Variables and Applications*. McGraw Hill International Book Co., Singapore. (Third Edition)

Reference Books

1. P. Duraipandian and LaxmiDuraipandian (1976) Complex Analysis: Emerald Publishers, Chennai.
2. S. Ponnusamy. (2000) Foundations of Complex Analysis, Narosa Publishing House, New Delhi.
3. Murray R. Spiegel. (2005) Theory and Problems of Complex Variable. Tata-Mcgraw Hill Edition, New Delhi.

PAPER - 15

PROGRAMMING IN C LANGUAGE

Objectives

To develop programming skill in the Computer Language C

UNIT-I

C Constants, variables, Data-type, Declaration of variables, assigning values to variables.

UNIT-II: Operators

Arithmetic, Relational, Logical, Assignment, Increment and decrement, Conditional, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic operators, Formatted input and output.

UNIT-III: Operators

Decision making and branching If, simple if, If else, Nesting of if - else, Else - If ladder, Switch statement, the?: operator, Go to statement. Decision making with looping: While, Do, for statement, Jumps in loops.

UNIT-IV: Arrays

One - dimensional array, two - dimensional array, Initializing arrays, Multi - dimensional arrays.

UNIT-V: User-Defined Function

Need for User-defined function, Multi-function program, the form of C-Function, Return Value and their types.

Structures and Unions:

Structure definition, Structure initialization, Comparison of structure variables, union.

Recommended Text

E.Balagurusamy. (1996) *Programming in ANSI C*. Tata McGraw Hill, New Delhi

Reference Books

1. V.Rajaraman. (1995) *Computer Programming in C*. Prentice Hall. New Delhi
2. H. Schildt, Osborne. (1994) *Teach Yourself C* McGraw Hill. New York.
3. Mullish Cooper. *The Spirit of C- An Introduction to Modern Programming*. Jaico Publishing House. Delhi. 1998.
4. Yashavantkanetkar, let us C, 16TH edition BPB publication.
5. Dr.P.Rizwan Ahmed, Programming in C, Margham Publications, 2016

PRACTICAL
PRACTICAL IN C LANGUAGE

Objectives

This computer practice course aims to provide strong logical thinking and error-free syntax codes writing, to master the debugging techniques and to present the results in neat form in C Language for numerical methods. Students will be able to solve problems numerically whenever theoretical methods are not available.

The following exercises shall be performed as minimum mandatory requirements (for eligibility to take the practical examination) and a RECORD of the code-listing and outputs shall be maintained by each students.

1. Assigning the ASCII value.
2. Square of numbers: Using For loop, While loop
3. Square of numbers: Do-While loop, Goto statement.
4. Characters between two given characters.
5. Number of vowels and consonants.
6. Three – dimensional matrix.
7. Prime numbers between two give numbers.
8. Fibonacci series.
9. Factorial numbers
10. Power of a value.
11. Interchange sort.
12. Student record.

Note: Mathematics faculty should be appointed as an Examiner.

Reference Books

1. The spirit of C, Mullish Cooper, Indian Edition by Jaico Publishers, 1987.
2. Teach yourself C, Herbert Schildt, Obsbome Megrawhill, 2nd Edition 1994.
3. Programming in C, Schaum Series.

ELECTIVE
(to choose 1 out of the given 2)

PAPER - 2

OPERATIONS RESEARCH

Objectives

To develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions to these problems.

UNIT-I

Network-construction of network diagram-Critical path method (CPM) – Three floats

UNIT-II

Three time estimates-Network scheduling by PERT Method-PERT Computation

UNIT-III

Inventory models - EOQ model (a) Uniform demand rate infinite production rate with no shortages (b) Uniform demand rate finite production rate with no shortages – Inventory control with Price Breaks.

UNIT-IV

Sequencing problem - n jobs through 2 machines, n jobs through 3 machines - two jobs through m machines – n jobs through m machines.

UNIT-V

Queuing Theory - Basic concepts - Steady state analysis of M/M/1 and M/M/N systems with finite and infinite capacities.

Recommended Text: Gupta P.K. and Hira D.S. (2000) *Problems in Operations Research*, S.Chand & Co. Delhi

Reference Books

1. J.K.Sharma, (2001) *Operations Research: Theory and Applications*, Macmillan, Delhi
2. KantiSwaroop, Gupta P.K. and Manmohan, (1999) *Problems in Operations Research*, Sultan Chand & Sons., Delhi.
3. V.K.Kapoor [1989] *Operations Research*, sultan Chand & sons.
4. Ravindran A., Philips D.T. and Solberg J.J., (1987) *Operations research*, John Wiley & Sons, New York.
5. Taha H.A. (2003) *Operations Research*, Macmillan Publishing Company, New York.
6. P.R.Vittal (2003) *Operations Research*, Margham Publications, Chennai.
7. S.J.Venkatesan, *Operations Research*, J.S. Publishers, Cheyyar-604 407.
8. Arumugam&Issac, *Operations research - Vol. - I*, New Gamma Pub., House. Palayamkottai.

PAPER - 2

CALCULUS OF FINITE DIFFERENCES AND NUMERICAL METHODS

(To be chosen only by those students who have not taken Numerical Methods as Allied subject)

Objectives

This course covers the basic methods for finding the finite difference, solution of simultaneous equations and the techniques of Numerical Differentiation and Numerical Integration. It also deals with solution of Algebraic and Transcendental equations.

(Note: All The Formulae Without Proof - Units I to V)

UNIT-I: Finite differences & Interpolation

Forward difference operator Δ and Backward difference operator ∇ and shifting operator E, Relation between Δ , ∇ and E - Interpolation - Newton - Gregory forward & backward formulae, Estimating the missing terms- Lagrange's and Newton's divided difference Formula for unequal intervals.

UNIT-II: Solutions of simultaneous linear equations

Gauss elimination method - matrix inversion method - Gauss-Jordan Method, Gauss – Seidal method.

UNIT-III: Numerical Differentiation

Newton's forward and backward differences formulae to compute derivatives - using Gauss forward and backward formulae.

UNIT-IV: Numerical Integration

General Quadrature formula - Trapezoidal rule - Simpson's one third rule - Simpson's three-eighths rule.

UNIT-V: Solution of Algebraic and Transcendental Equations:

Bisection method - Regula - falsi method (False Position method) – Newton - Raphson method. Numerical solution of ordinary Differential equation (First order only): Euler's method, modified Euler's method, Picard's method, Runge - Kutta method

Recommended Text

1. B.D. Gupta. (2001) *Numerical Analysis*. Konark Pub. Ltd., Delhi.
2. H.C.Saxena, Calculus of finite differences and Numerical Analysis, S. Chand & Co., New Delhi. IX Edition.

Reference Books

1. M.K.Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.
2. S. Arumugam (2003) - Numerical Methods, New Gamma Pub., for Palayamkottai.
3. A.Singaravelu, Numerical Methods, Meenakshi Publications-First Edition 1992.

ELECTIVE - III

PAPER – 3

A. SPECIAL FUNCTIONS

Objectives

To develop computational skill in certain special functions which are frequently occurring in higher mathematics and mathematical physics.

UNIT-I

Properties of Linear Operators - Simultaneous Linear Differential Equations -

UNIT-II

Special Solvable Types of Nonlinear Equations. Numerical Solutions Using Taylor Series
-

UNIT-III

Adams and Modified Adams Method - Extrapolation with
Differences Properties of Power Series - Examples

UNIT-IV

Singular Points of Linear Second Order Differential Equations - Method of Frobenius.

UNIT-V

Bessel Functions - Properties – Legendre Functions.

Recommended Text

F.B.Hildebrand. (1977) *Advanced Calculus for Applications*. Prentice Hall. New Jersey.

Reference Books

1. J.N.Sharma and R.K.Gupta (1998) *Special Functions*, Krishna PrakashanMandir, Meerut.
2. SatyaPrakash. (2004)*Mathematical Physics*. Sultan & Sons. New Delhi.
3. B.D.Gupta (1978) *Mathematical Physics*, Vikas Publishing House.

PAPER – 3

B.FUZZY MATHEMATICS

Objectives

1. To know the fundamentals of fuzzy Algebra.
2. To know the basic definitions of fuzzy theory
3. To know the applications of fuzzy Technology.

UNIT-I

Introduction- Fuzzy subsets-Lattices and Boolean Algebras- L fuzzy sets-operations on fuzzy α level sets – properties of fuzzy subsets of a set. section s 1.1-1.10

UNIT-II

Algebraic product and sum of two fuzzy subsets-properties satisfied by Addition and product-cartesian product of fuzzy subsets. Sections 1.11-1.13.

UNIT-III

Introduction- Algebra of fuzzy relations-logic-connectives. section s 2.1-2.4

UNIT-IV

Some more connectives-Introduction-fuzzy subgroup-homomorphic image and Pre-image of subgroupoid. Sections 2.5,3.1-3.3

UNIT-V

Fuzzy invariant subgroups-fuzzy subrings.

Section 3.4 and 3.5.

Recommended Text S.Nanda and N.R.Das “Fuzzy Mathematical concepts,Narosa Publishing House, New Delhi.

SKILL BASED SUBJECT

PAPER - 4

MATHEMATICS FOR COMPETITIVE EXAMINATIONS - III

Unit- I

Simple Interest.

Unit- II

Compound Interest

Unit- III

Logarithms – Races and Games of Skill.

Unit- IV

Area

Unit- V

Volume and surface areas.

Text Book:-

Quantitative Aptitude for competitive Examination , R.S.Aggarwal. S.Chand and company Ltd, 152, Anna salai, Chennai. 2001

ALLIED SUBJECTS FOR MATHEMATICS STUDENTS

To choose any two out of the following Four Allied subjects as Allied I and Allied II.
Each Allied subject consists of two Examination papers as paper I and Paper II.

1. Mathematical Statistics (Paper I and II)
2. Numerical Methods (Paper I and II)
3. Physics (Paper I and II)
4. Chemistry (Paper I and II)

ALLIED
MATHEMATICAL STATISTICS - I

Objective

To apply Statistics Methods for Mathematical Problems

UNIT-I

Concept of Sample Space - Events - Definition of Probability (Classical, Statistical and Axiomatic) - Addition and Multiplication laws of Probability - Independence of Events - Conditional Probability - Baye's Theorem - Simple Problems.

UNIT -II

Random Variables (Discrete and Continuous) - Distribution Function - Expectation and Moments - Moment Generating Function - Probability Generating Function - Cumulant Generating Function - Simple Problems.

UNIT-III

Characteristic Function - Properties - Uniqueness and Inversion Theorem (Statement only) Chebychev's Inequality - Simple Problems

UNIT-IV

Concept of Bivariate Distribution - Correlation - Karl Pearson's Coefficient of Correlation - Rank Correlation - Linear Regression.

UNIT-V

Standard distributions: Discrete distributions - Binomial, Poisson, Hyper Geometric and Negative Binomial Distributions - Continuous Distributions Normal, Uniform, Exponential.

Recommended text book:

S.C. Gupta & V.K. Kapoor : Fundamentals of Mathematical Statistics, Sultan & sons

Books for Reference

1. Hogg, R.V. & Craig, A.T. (1998) : Introduction to Mathematical Statistics, Macmillan
2. Mood, A.M. Graybill, F.A. & Boes, D.G. (1974) : Introduction to theory of Statistics, McGraw Hill.
3. Snedecor, G.W. & Cochran, W.G. (1967) : Statistical Methods, Oxford and IBH
4. Hoel, P.G (1971): Introduction to Mathematical Statistics, Wiley.
5. Wilks S.S. Elementary Statistical Analysis, Oxford and IBH

ALLIED

MATHEMATICAL STATISTICS II

Objective

To apply Statistics for Mathematical problems

UNIT-I

Statistical Population Census and Sampling Survey - Parameter and Statistics - Sampling and Sampling Distribution and Standard Error. Sampling distributions - students 't', chi - square and F distributions.

UNIT-II

Test of significance - Large sample test for proportion, mean and standard deviation - Exact test based on 't', Chi - square and F distribution with respect to population mean, variance and correlation coefficient - Tests of independence of attributes - goodness of fit tests.

UNIT-III

Point estimation - Concept of unbiasedness, consistency, efficiency and sufficiency - Cramer- Rao Inequality - Methods of Estimation - Maximum Likelihood Estimation - Method of Moments.

UNIT-IV

Test of Hypothesis: Null and Alternate Hypothesis - Type I and Type II error - Power of the test - Neymann Pearson lemma - Likelihood Ratio Test - Concept of Most Powerful test (Statement and Results only) - Simple Problems

UNIT-V

Analysis of Variance - One - way and Two-way Classification - Basic Principles of Design of Experiments - Randomization, Replication, Local Control, Completely Randomized Design, Randomized Block Design and Latin Square Design.

Recommended Text:

S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics, Sultan & sons

Books for Reference

1. Hogg, R.V. & Craig, A. T. (1998): Introduction to Mathematical Statistics, Macmillan
2. Mood.A.M., Graybill. F.A. & Boes. D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
3. Snedecor.G.W. & Cochran.W.G. (1967): Statistical Methods, Oxford and IBH
4. Hoel.P.G (1971): Introduction to Mathematical Statistics, Wiley.
5. Wilks . S. S. Elementary Statistical Analysis, Oxford and IBH
6. O. Kempthorne - Design of Experiments
7. Das and Giri : Design of Experiments Wiley Eastern

**ALLIED PRACTICAL
MATHEMATICAL STATISTICS**

1. Measures of location and Dispersion (absolute and relative)
2. Computation of Correlation Coefficient for raw and Grouped data, Rank Correlation Coefficient
3. Computation of Regression Equations for Raw and Grouped Data
4. Curve Fitting by the Method of Least Squares
 - a. $y=ax+b$
 - b. $y=ax^2+bx+c$
 - c. $y=ae^{bx}$
 - d. $y=ax^b$
5. Fitting of Binomial, Poisson, Normal distributions and tests of goodness of fit.
6. Large sample tests with regard to population mean, proportion, standard deviation
7. Exact tests with Respect to Mean, Variance and Coefficient of Correlation
8. Test for Independence of Attributes Based on Chi-Square Distribution
9. Confidence Interval based on Normal, t and Chi-square and F Distributions
10. Problems based on ANOVA-one way and two way Classification
11. Completely Randomized Design
12. Randomized Block Design
13. Latin Square Design

Note

Use of scientific calculator shall be permitted for practical examination.
Statistical and Mathematical tables are to be provided to the students at the examination hall.

- ☐ Mathematics faculty alone should be appointed as examiners.

Books for Reference

1. Hogg, R.V. & Craig, A.T. (1998): Introduction to Mathematical Statistics, Macmillan.
2. Mood, A.M., Graybill, F.A. & Boes, D.G. (1974) : Introduction to theory of Statistics, McGraw Hill.
3. Snedecor, G.W. & Cochran, W.G. (1967): Statistical Methods, Oxford and IBH
4. Hoel, P.G. (1971): Introduction to Mathematical Statistics, Wiley.
5. S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics, Sultan & sons
6. S.C. Gupta & V.K. Kapoor: Fundamentals of Applied Statistics, Sultan & sons
7. Wilks, S. S. Elementary Statistical Analysis, Oxford and IBH
8. O. Kempthorne - Design of Experiments.

ALLIED PAPERS

NUMERICAL METHODS - I

Objectives

This course will cover basic methods for finding the Finite differences, Central differences, Inverse interpolation, Summation of series, Interpolation for equal & unequal intervals, Solutions of simultaneous equations, Important principles, Method and Processes to get numerical results, Reliability of numerical result.

UNIT-I: Finite Differences

First and higher order differences-forward differences and Backward differences-Properties of operators-Differences of a Polynomial-Factorial Polynomials-Operator E, Relation between Δ , ∇ and E-Interpolation - Newton - Gregory forward & backward formulae for interpolation.

UNIT-II: Central Differences

Central difference Operators-Central differences formulae: Gauss Forward and Backward formulae-Sterling's formula-Bessel's formula.

UNIT-III: Interpolation for Unequal Intervals

Divided differences-Newton's divided differences formula and Lagrange's-Estimating the Missing terms (With one or more missing values).

UNIT-IV: Inverse Interpolation

Lagrange's method and Reversion of series method (Using Newton's forward formula only).

Summation of series: Sum to n term of the series whose general term is the first difference of a function-summation by parts.

UNIT-V: Solutions of Simultaneous Linear Equations

Gauss elimination method-matrix inversion method-Gauss-Jordan Method, Gauss-Seidal method (Three unknowns only).

Recommended Text

1. B.D. Gupta.(2001) *Numerical Analysis*.Konark Pub. Ltd., Delhi
2. M.K. Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.

Reference Books

1. S. Arumugham. (2003) *Numerical Methods*, New Gamma Publishing, Palamkottai.
2. H.C. Saxena. (1991) *Finite differences and Numerical analysis* S.Chand & Co., Delhi
3. A.Singaravelu (2004). *Numerical Methods*Meenakshi Agency, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) *Calculus of Finite difference & Numerical Analysis*, S. Chand & Company Ltd., New Delhi-55.

NUMERICAL METHODS II

Objectives

This course covers the techniques of Numerical Differentiation and Numerical Integration. It also deals with solution of difference equations, Algebraic and Transcendental equations and Numerical solution of Ordinary differential equations of first order.

UNIT-I: Numerical Differentiation

Newton's forward and backward differences to compute derivatives-derivative using divided differences formula-maxima and minima using the above formulae.

UNIT-II: Numerical Integration

General Quadrature formula-Trapezoidal rule-Simpson's one third rule-Simpson's three-eighth rule, Weddle's rule- Euler-Maclaurin Summation Formula

UNIT-III: Difference Equations

Linear difference equations-Linear homogeneous difference equation with constant co-efficient-Particular integrals for a^x , x^m , $\sin ax$, $\cos ax$ and $a^x f(x)$.

UNIT-IV: Solution of Algebraic and Transcendental Equations

Bisection method-Iteration method-Regula-falsi method (False Position Method)-Newton-Rapson Method.

UNIT-V: Numerical Solution of Ordinary Differential Equations (First order only)

Euler's method- Euler's modified method-Picard's method - Taylor's methods-Runge-Kutta method (Fourth order only).

Recommended Text

1. B.D. Gupta. (2001) *Numerical Analysis*. Konark Pub. Ltd., Delhi
2. M.K.Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.

Reference Books

1. Gupta-Malik, Calculus of finite differences and numerical Analysis, KrishbaPrakashanMandir, Meerut Seveenth Edition.
2. S.C.Saxena, Calculus of finite differences and Numerical Analysis, S.Chand& Co., New Delhi. IX Edition.
3. A.Singaravelu, Numerical methods, Meenakshi Publications-First Edition 1992.
4. P.Kandasamy, K.Thilagavathy (2003) Calculus of Finite Difference & Numerical Analysis, S.Chand& Company Ltd., New Delhi-55.

**ALLIED PRACTICAL
NUMERICAL METHODS**

LIST OF PROBLEMS

1. Derivatives by Newton's method
2. Gauss elimination method.
3. Gauss-Jacobi method.
4. Gauss-Siedel method.
5. Power method (eigenvalue).
6. Newton's forward and backward interpolation.
7. Lagrange interpolation.
8. Trapezoidal and Simpson one-third rules.
9. Euler's method.
10. Picard's method
11. Runge-Kutta's method.
12. Predictor-corrector method.

**ALLIED
PHYSICS - I**

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak,Cambridge,University Press(1999).

**ALLIED
PHYSICS II**

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davisson and Germer's Experiment – G.P. Thomson's Experiment – Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell – Bravais lattice- structures of simple cubic-BCC and FCC- coordination number, packing factor calculation for the above structures – Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology–limitations.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
9. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
10. Renewable & Sustainable energy sources – Agarwal.

ALLIED PRACTICAL

PHYSICS

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Rigidity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
8. Sonometer – frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer Grating – Minimum Deviation – Mercury Lines.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT by transistors.
18. Zener diode – Voltage Regulation.
19. NAND / NOR as universal gate.
20. Demorgan's theorem verification.

ALLIED

PAPER – 1

CHEMISTRY – I

OBJECTIVE:

- Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1 General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Flux, Slag - Definition - Reduction methods - Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

2. Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3 Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation - Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons –
Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3 , PCl_5 , SF_6 and XeF_6 .

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1 Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking – Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

**ALLIED
PAPER – 2
CHEMISTRY – II**

OBJECTIVE:

- Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biological functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions - Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1 Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- R_f value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

**ALLIED PRACTICAL
CHEMISTRY**

VOLUMETRIC ANALYSIS

1. Estimation of HCl – Standard sulphuric acid.
2. Estimation of Borax - Standard Sodium Carbonate.
3. Estimation of NaOH – Standard Oxalic Acid.
4. Estimation of FeSO_4 – Standard FAS.
5. Estimation of Oxalic acid – Standard FeSO_4 .
6. Estimation of FAS – Standard Oxalic Acid.
7. Estimation of Oxalic acid – Standard Oxalic Acid.
8. Estimation of Fe^{2+} using Diphenylamine / N- Phenyl Anthranilic acid as indicator.

ORGANIC ANALYSIS

Systematic Analysis of Organic Compounds containing One Functional Group and Characterisation by Confirmatory Tests.

Reactions of Aromatic Aldehyde, Carbohydrates, Mono and Dicarboxylic acids, Phenol, Aromatic Primary Amine, Amide and Diamide.

REFERENCE BOOKS

- ❖ Inorganic Chemistry - P. L. Soni - Sultan Chand (2006).
- ❖ Inorganic Chemistry - B. R. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
- ❖ Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D. Madan - S. Chand Publications (2008).
- ❖ Text Book of Inorganic Chemistry – R. Gopalan, Universities Press – 2012.
- ❖ Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.
- ❖ Advanced Organic Chemistry - Bahl and Arun Bahl - Sultan Chand and Co. Ltd – 2012.

- ❖ Organic Reaction Mechanisms - Gurdeep Chatwal- Himalaya Publishing House.
- ❖ A Text Book of Organic Chemistry K. S. Tewari, N. K. Vishol, S. N. Mehrotra- Vikas Publishing House – 2011.
- ❖ Principles of Physical Chemistry - B. R. Puri, Sharma and Madan S. Pathania, Vishal Publishing Company – 2013.
- ❖ Text Book of Physical Chemistry - P. L. Soni, O. P. Dharmarha and U. N. Dash - Sultan Chand & Co – 2006.
- ❖ Understanding chemistry – C. N. R. Rao, Universities Press – 2011.

SCHEME OF VALUATION FOR ALLIED CHEMISTRY PRACTICALS

Internal assessment: 25 Marks

External assessment: 75 marks

Total: 100 marks

Max. Marks: 75

Record: 15 Marks

Volumetric Analysis: 30 Marks

Organic Analysis : 30 Marks

Volumetric Analysis : 30 Marks (Maximum)

Procedure : 5 Marks

Error upto 2 % : 25 Marks

2.1 to 3 % : 20 Marks

3.1 to 4 % : 15 Marks

4.1 to 5 % : 10 Marks

> 5 % : 5 Marks

Arithmetic error : Deduct 1 mark

Wrong calculation : Deduct 20 % of marks scored

No calculation : Deduct 40 % of marks scored

Organic Analysis : 30 Marks

Preliminary Reactions : 4 Marks

Aliphatic or Aromatic : 4 Marks

Saturated or unsaturated : 4 Marks

Tests for 3 elements : 9 Marks (3 x 3)

Tests for functional group : 9 Marks.

THIRUVALLUVAR UNIVERSITY
BACHELOR OF SCIENCE
B.Sc. ZOOLOGY
DEGREE COURSE
CBCS PATTERN
(With effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|--------------------------|-------------|----------------------|--------|---|---------------|--------------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 6 | Invertebrata | 25 | 75 | 100 |
| | III | Core Practical | Practical-1 | 3 | 0 | Invertebrata and Chordata | 0 | 0 | 0 |
| 4 | III | Allied-1 | Paper-1 | 4 | 4 | One out of 3 1. Chemistry – I 2. Botany – I 3. Economic Entomology – I | 25 | 75 | 100 |
| | III | Allied Practical | Practical-1 | 3 | 0 | | 0 | 0 | 0 |
| 5 | IV | Environmental Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 125 | 375 | 500 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 6 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 7 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 8 | III | Core Theory | Paper-2 | 6 | 5 | Chordata | 25 | 75 | 100 |
| 9 | III | Core Practical | Practical-1 | 3 | 3 | Invertebrata and Chordata | 25 | 75 | 100 |
| 10 | III | Allied-1 | Paper-2 | 4 | 4 | One out 3 1. Chemistry – II 2. Botany – II 3. Economic Entomology – II | 25 | 75 | 100 |
| 11 | III | Allied Practical | Practical-1 | 3 | 2 | | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skills | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |
| | | | | | | | | | |

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|------------------------|-------------|----------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER III | | | | | | | | | |
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-3 | 3 | 3 | Cell and Molecular Biology | 25 | 75 | 100 |
| 17 | III | Core Practical | Practical-2 | 3 | 0 | Cell and Molecular Biology, Genetics and Biotechnology | 0 | 0 | 0 |
| 18 | III | Allied-2 | Paper-3 | 4 | 4 | One out of 3 1. Chemistry – I 2. Botany – I 3. Economic Entomology – I | 25 | 75 | 100 |
| | III | Allied Practical | Practical-2 | 3 | 0 | | 0 | 0 | 0 |
| 19 | IV | Skill Based Subject | Paper-1 | 3 | 3 | To choose one out of 2 A. Public Health and Hygiene B. Single cell protein culture | 25 | 75 | 100 |
| 20 | IV | Non-Major Elective | Paper-1 | 2 | 2 | To choose one out of 2 A. Vermiculture B. Poultry farming | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | | | |
| 21 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-4 | 3 | 3 | Genetics and Biotechnology | 25 | 75 | 100 |
| 24 | III | Core Practical | Practical-2 | 3 | 3 | Cell and Molecular Biology, Genetics and Biotechnology | 25 | 75 | 100 |
| 25 | III | Allied-2 | Paper-4 | 4 | 4 | One out of 3 1. Chemistry – II 2. Botany – II 3. Economic Entomology – II | 25 | 75 | 100 |
| 26 | III | Allied Practical | Practical-2 | 3 | 2 | | 25 | 75 | 100 |
| 27 | IV | Skill Based Subject | Paper-2 | 3 | 3 | To choose one out of 2 A. Bio fertilizer production B. Apiculture | 25 | 75 | 100 |
| 28 | IV | Non-Major Elective | Paper-2 | 2 | 2 | To choose one out of 2 A. Sericulture B. Aquarium fish keeping | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |
| | | | | | | | | | |

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|-------------------------|-------------|----------------------|--------|---|---------------|--------------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 29 | III | Core Theory | Paper-5 | 6 | 5 | Biostatistics and Bioinformatics | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper-6 | 6 | 5 | Developmental Biology and Immunology | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper-7 | 6 | 5 | Animal Physiology | 25 | 75 | 100 |
| 32 | III | Core Practical | Practical-3 | 3 | 0 | Animal Physiology and Developmental Biology and Immunology | 0 | 0 | 0 |
| 33 | III | Core Practical | Practical-4 | 3 | 0 | Environmental Biology and Economic Zoology | 0 | 0 | 0 |
| 34 | III | Elective I | Paper-1 | 3 | 3 | To choose one out of 2 A. Bio-instrumentation B. Human Endocrinology | 25 | 75 | 100 |
| 35 | IV | Skill Based Subject III | Paper - 3 | 3 | 3 | To choose 1 out of 2 A. Pisciculture B. Mushroom culture | 25 | 75 | 100 |
| | | | | 30 | 21 | | 125 | 375 | 500 |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 36 | III | Core Theory | Paper-8 | 5 | 5 | Environmental Biology | 25 | 75 | 100 |
| 37 | III | Core Theory | Paper-9 | 5 | 4 | Economic Zoology | 25 | 75 | 100 |
| 38 | | Core Theory | Paper-10 | 5 | 4 | Evolution | 25 | 75 | 100 |
| 39 | III | Core Practical | Practical-3 | 3 | 3 | Animal Physiology and Developmental Biology and Immunology | 25 | 75 | 100 |
| 40 | III | Core Practical | Practical-4 | 3 | 3 | Environmental Biology and Economic Zoology | 25 | 75 | 100 |
| 41 | III | Elective | Paper-2 | 3 | 3 | To choose one out of 2 A. Biochemistry B. Applied Entomology | 25 | 75 | 100 |
| 42 | III | Elective | Paper-3 | 3 | 3 | To choose one out 2 A. Nanotechnology in life sciences B. Microbiology | 25 | 75 | 100 |
| 43 | IV | Skill based Subject | Paper-4 | 3 | 3 | To choose one out of 2 A. Medical Lab Techniques B. Industrial fishery management | 25 | 75 | 100 |
| 44 | V | Extension Activities | | 0 | 1 | | 25 | 75 | 100 |
| | | TOTAL | | 30 | 29 | | 225 | 675 | 900 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|-------------|------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied Practical | 2 | 2 | 4 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core Theory | 10 | (3-7) | 45 | 100 | 1000 |
| | Core Practical | 4 | 3 | 12 | 100 | 400 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 41 | | 140 | | 4100 |

THIRUVALLUVAR UNIVERSITY
BACHELOR OF SCIENCE
B.Sc. ZOOLOGY
DEGREE COURSE - CBCS PATTERN
(With effect from 2017 - 2018)

SEMESTER I
PAPER – 1
INVERTEBRATA

Objectives:

To acquire wide knowledge about different kinds of animal species especially invertebrates.
To understand the systematic and functional morphology of various groups of invertebrates.
To study their economic importance, affinities and adaptations.

UNIT – I

Principles of Taxonomy – Binomial nomenclature-rules of nomenclature – classification of the animal kingdom. **PROTOZOA:** General characters and classification up to classes with examples. **Type study-** **paramecium**, parasitic protozoans [Entamoeba, Trypanosoma and plasmodium]

UNIT – II

PORIFERA: General characters and classification up to classes with examples. **Type study** - **sycon**, spicules and canal system in sponges. **COELENTERATA:** General characters and classification up to classes with examples. **Type study** – **Obelia**, polymorphism in coelenterates – corals and coral reefs.

UNIT – III

HELMINTHES: General characters and classification up to classes with examples. **Type study** – **Taenia solium**. helminthes parasites (Wuchereria bancrofti, Ascaris and Faciola). **ANNELIDA:** General characters and classification up to classes with examples. **Type study:** **Nereis**, metamerism in Annelids, parasitic adaptations of Leech.

UNIT – IV

ARTHROPODA: General characters and classification up to classes with examples. **Type study** – **Prawn**, Peripatus and its affinities, Mouth parts of insects.

UNIT – V

MOLLUSCA: General characters and classification up to classes with examples. **Type study** – **Fresh water Mussel**, Economic importance of mollusca. **ECHINODERMATA:** General characters and classification up to classes with examples. **Type Study-** **Sea star**, Echinoderm larvae and their significance.

Reference Books:

- Ekambaranatha Ayyar.M. and T.N. Ananthakrishnan, 1992. Manual of Zoology Vol.1 [Invertebrata],
Viswanathan [Printers and Publishers] Pvt. Ltd.; Madras.
- Jordan, E.L. and P.S.Verma, 1993. Invertebrate Zoology, 12th Edition. S.Chand and Co.Ltd., NewDelhi.
- Kotpal, R.L. 1988-1992 Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
- Parker and Haswell, 1964. Test Book of Zoology. Vol.1 [Invertebrata]. A.Z.T; B.S.Publishers and distributors, New Delhi.
- L.A Borrardile and F.A.Pott. The Invertebrates. Cambridge University Press. UK.
- Adam Sedgwick. 1972 A student text book of Zoology. Vol.I and II. Central book Depot. Allahabad.
- P.S.Dhami and J.K.Dhami. Invertebrate Zoology, S.Chand and Co. New Delhi.
- Hyman L.H. The Invertebrate Vol.I-IV. 1955, McGraw Hill Co. New York.
- Barrington, E.J.W. 1969. Invertebrate structure and function. ELBS Publication.
- Barnes. Invertebrate Zoology. Toppan International Co.

SEMESTER II

PAPER – 2 CHORDATA

Objectives:

To acquire wide knowledge about different kinds of animal species especially vertebrates.
To understand the systematic and functional morphology of various groups of chordates.
To study their affinities and adaptations to different modes of life.

UNIT – I

Salient Features and General classification of Phylum chordata upto orders.

Origin of Chordata.- Sub phylum: Prochordata: Type study: Amphioxus (Cephalochordata) - General Characters and affinities of Hemichordata- **Balanoglossus & Urochordata- Ascidian.**

UNIT –II

Class PISCES General characters and classification up to orders. **Type study: Shark.** Accessory respiratory organs in fishes. -**Class AMPHIBIA** General characters and classification up to orders. **Type study : Frog** - Adaptive features of Anura, Urodela & Apoda. Parental care in Amphibia - Neoteny

UNIT – III

Class REPTILIA- General characters and classification upto orders. **Type study – Calotes.** Poison apparatus and biting mechanism of poisonous snakes. Identification of poisonous and non – poisonous snakes.

UNIT – IV

Class AVES - General characters and classification upto orders. **Type study – Pigeon** Characters of Archaeopteryx, Ratitae, Migration in birds, Flight adaptation.

UNIT – V

MAMMALIA - General characters and classification upto orders. **Type study – Rabbit.** Egg laying mammals. Dentition in mammals. Aquatic mammals.

Reference Books:

Ekambaranatha Ayyar, M and T.N Anantha Krishnan 1992, A manual of zoology Vol. II [Chordata].

S. Viswanathan [Printers and publishers] Pvt. Ltd., Madras.

Jordan E. L. and P.S. Verma 1995. Chordate Zoology and elements of Animal Physiology. S. Chand and co., New Delhi.

Kotpal R.L. 1992. Vertebrata, Rastogi publication, Meerut.

Nigam. H.C 1983 Zoology of chordates, Vishal publications, Jalandhar.

Waterman, Allyn J. et al. 1971, Chordate Structure and functions, Mac. Millan and co., New York.

Jollie. M. 1968. Chordate Morphology. East west press Pvt. Ltd., New Delhi.

Hyman. L.H. Comparative vertebrate zoology. McGraw Hill co. New York.

CORE PRACTICAL – I

INVERTEBRATA AND CHORDATA

DISSECTIONS

Cockroach – Digestive and Nervous system, **Prawn** – Nervous system, **Fish** (any one) – Digestive and Arterial system

MINOR PRACTICAL

MOUNTING -Insect Mouth parts : Cockroach, Honey bee, House Fly and Mosquito
Prawn – Appendages, **Shark** - Placoid scales, **Earthworm** – Body setae

SPOTTERS

Study of the following specimens

1. Classify by giving reasons

Paramecium, Sycon, Obelia, Taenia solium, Nereis, Prawn, Freshwater mussel, Seastar, Amphioxus, Shark, Hyla, Rhacophorus, Calotes, Pigeon, Rat/Rabbit.

2. Adaptations to their respective modes of life

Entamoeba, Trypanosoma, Plasmodium, Corals [any 2], Ascaris, Fasciola, Wuchereria bancrofti, Cheatopterus, Leech, Limulus, Nauplius, Mysis, Zoea, Balanoglossus, Ascidian, Ichthyophis, Draco, sea snake and Bat.

3. Biological significance:

Paramecium conjugation and binary fission, physalia, Trochophore Larva, Peripatus, Sacculina on Crab, Sea Anemone on Hermit Crab, Pearl Oyster, Bipinnaria Larva, Anabas, Hippocampus, Narcine, Echeneis, Arius, Exocoetus, Eel, Amblystoma, Axolotl Larva, Bufo, Cobra, Krait, Russels Viper, Echis Carinata, Turtle, Parrot, Woodpecker, King Fisher and Ant eater

4. Relate structure and function:

Sponge Spicules, Obelia Polyp, Taenia Scolex, Nereis - Parapodium, Book lungs of scorpion/Honey bee sting apparatus, Pedicellaria of Sea star, Ctenoid Scale and Quill Feather of pigeon.

5. Draw labeled sketches:

T.S. of Nereis, T.S. of Leech, Obelia medusa, T.S. of Amphioxus through Pharynx, T.S. through arm of Sea star.

6. Osteology

Skeleton - Pectoral girdles of Frog and Pigeon., Pelvic Girdles of Frog and Pigeon.

Fore and Hind limbs of Frog and Pigeon., Synsacrum of Pigeon. **Dentition** - Dog, Rabbit and Man

Reference Books:

Verma. P.S. 2011 A Manual of Practical Zoology INVERTEBRATES Chand & Co, Ltd, Ram Nagar -New Delhi.

Verma. P.S. 2011 A Manual of Practical Zoology CHORDATES, Chand & co, Ltd. Ram Nagar – New Delhi.

Jayanpa Sinha . 2010 Advanced Practical Zoology, Books & Allied (p) Ltd. No.1. Subham Plaza IFloor, Calcutta.

SEMESTER III
PAPER – 3
CELL AND MOLECULAR BIOLOGY

Objectives:

To learn the cytological techniques, the structure and functions of various cellular components.

To understand the integrated activity of the whole cell as in mitosis, meiosis and protein synthesis.

To understand the molecular basis of cell structure DNA structure and functions.

UNIT – I

History of Cell and Molecular Biology – Principles of microscopes light and electron, **Cytological techniques** - cell fractionation, Homogenization Centrifugation, Isolation of Sub-cellular components. **Biochemical techniques** – Electrophoresis and their applications. **Cell culture techniques** and applications.

UNIT – II

Cell – Cell theory, Ultra structure of animal cell – structure, composition and functions – cell components – Plasma Membrane – Endoplasmic reticulum, Ribosomes, Golgi Complex, Lysosomes, Glyoxisomes, peroxisomes, centrioles and Mitochondria.

UNIT – III

Cytoplasm – Physical, chemical and biological properties. **Nucleus** – Ultrastructure, Composition and Function – **Chromosomes** – Giant chromosomes (Polytene and Lamp brush chromosomes).

UNIT – IV

Cell cycle and cell division – Amitosis, Mitosis and meiosis and their significance. **Cancer biology** – structure of cancer cell, carcinogenesis. **Aging** – Cell death and apoptosis.

UNIT – V

Structure and functions of DNA & types of RNA [mRNA, tRNA, rRNA]. Semi conservative replication, mechanism and enzymology of DNA replication, **Protein synthesis**.

Reference Books:

Cohn, N.S., 1979, Elements of Cytology, Freeman Book co., New Delhi.

De Robertis, E.D.P. and E.M.F. De Robertis, 1988. Cell and molecular Biology, 8th Edition, International edition Informes Hongkong. 734p.

Gies, A.C., 1979. Cell Physiology, Saunders co., Philadelphia, London, Toronto, 609p.

Powar, C.B., 1989. Essentials of Cytology, Himalaya Publishing House, Bombay, 368p.

Verma, P.S., and V.K. Agarwal, 1995. Cell and Molecular Biology, 8th Edition, S. Chand & Co., New Delhi, 567p.

Rastogi. S.C. Cell and Molecular Biology, 2008 2nd Edition, New Age International (p) Ltd., New Delhi.

G.P. Jayanthi 2009 Molecular Biology, M.J P Publ. Chennai.

SKILLED BASED SUBJECT
PAPER – 1
A. PUBLIC HEALTH AND HYGIENE

Objectives:

To impart awareness on public health, Hygiene and diseases.
To educate and emphasize on preventive measures of diseases.
To create knowledge on Health Education.

UNIT – I

Scope of Public Health and Hygiene – Nutrition and health – classification of foods – Balanced Diet – malnutrition - Nutritional deficiencies – Vitamin deficiencies. Nutritional requirements of special groups.

UNIT – II

Environment and Health Hazards – Environmental degradation – pollution and associated health Hazards – Health problems due to industrializations – Hospital waste management.

UNIT – III

Communicable diseases and their control measures such as Measles, Polio, Chikungunya, Rabies, Plauge, Leprosy and AIDS.

UNIT – IV

Non – communicable diseases and their preventive measures such as Hypertension, Coronary Heart Diseases, Stroke, Diabetes, Obesity and Mental ill – Health. Alcoholism and drug dependence.

UNIT – V

Health Education and Health programmes in India – WHO programmes – government and voluntary Organizations and their health service – Precautions first Aid and awareness on sporadic diseases.

Reference Books:

Park and Park, 1995: Text book of preventive and social medicine – Banarsidas Bhanot Publ. jodhpur- India.
Verma, S. 1998: Medical zoology, Rastogi Publ.- Meerut- India
Singh, H.s. and Rastogi, P. 2009: Parasitology, Rastogi Publ. India.
Dubey, R.C and Maheswari, D.K. 2007: Text Book of Microbiology – S. Chand & co. Publ. New Delhi– India.

PAPER – 1

B. SINGLE CELL PROTEIN CULTURE

Objectives:

To have knowledge and importance of **Single cell protein (SCP)** culture techniques.

To emphasize the importance of integrating new knowledge of Food Biotechnology.

To update the technological innovations of Microbial organisms and its applications in Nutrition.

UNIT – I

The scope of food biotechnology- characterization, classification and identification of Microorganisms employed in **single cell protein (SCP)** cultivation.

UNIT – II

Algal sources of single cell proteins – Culture and extraction of SCP From spirulina Maxima, chlorella species.

UNIT – III

Bacterial sources of single cell proteins – culture and extraction of SCP from Bacillus species and methylococcus capsulatus.

UNIT – IV

Fungal sources of single cell proteins – culture and extraction from yeasts - Candida species. Extraction from filamentous fungi - Agaricus species

UNIT – V

General account on the production of SCP from Biomass and Waste Materials. Nutritive values of SCP – Dietary supplements for Human, Cattle and birds.

Reference Books:

Arumugam, N. 2006: Microbiology, Saras Publ. Nagercoil – India.

Kumarasan, V. 2001: Biotechnology, Saras Publ Nagercoil – india.

Agarwal, A.K. and Parihar,P.2006: Industrial microbiology – student edition –India.

Dubey, R.C and Maheswari, D.K. 2005: A Text Book of Microbiology – S. Chand & co., New Delhi.

Rao, A.S. 1997: Introduction to Microbiology – prentice – Hall, New Delhi, New Delhi-India.

Sullia, S.B. and shantharam, S.2005: General Microbiology, Oxford IBH – Publ.. New Delhi – India.

Krishnan, A. 2005: Students Dictionary of Microbiology – Student edition – india.

NON – MAJOR ELECTIVE

PAPER – 1

A. VERMICULTURE

Objectives:

To acquire knowledge about biofertilizer

To impart training on Earthworm culture technology

To create knowledge on Self - Employment opportunity

UNIT – I

Eathworm types – Morphological and Anatomical characteristics. Biology of Lampito maruitti.

UNIT – II

Vermicompost process -Types of Vermicomposting materials. Monoculture and polyculture techniques, factors affecting vermicomposting - pH, Moisture, temperature etc.

UNIT – III

Vermicomposting methods – Small scale and large scale pit method, heap method, Wind row method and bin method.

UNIT – IV

Vermicomposting: General procedure in Homes. Maintenance of vermicomposting beds. Harvesting the worms. Earthworm Predators, parasites and pathogens.

UNIT – V

Nutrients availability- Application of Vermicomposting in Agriculture and Horticultural practices. Advantages of Vermicompost and **marketing**.

Reference Books:

Edwards, C.A., and Bother, B. 1996: Biology of Earthworms – Chapman Hall Publ. Co., London.

Ismail, S.A. 1997: Vermitechnology – the Biology of Earthworms – Orient Longman Publ. – India.

Ranganathan, L.S. 2006: Vermibiotechnology from soil health to Human health – Agrobios – India.

Talashikar, S.C. 2008: Earthworms in Agriculture – Agrobios - India

Gupta, P.K. 2008: Vermicomposting for sustainable agriculture [2nd edition] – Agrobios – India.

PAPER – 1
B. POULTRY FARMING

Objectives:

To impart training on Modern Poultry Farming Technology.

To create knowledge on self employment opportunity.

UNIT – I

External morphology of variety of fowls- Plymouth rock, light Sussex, Minorca, Rhode Island, Red and White Leghorn.

UNIT – II

Classification of fowls based on their use: meat type - Broilers, Egg type – white leghorn and commercial layers, Dual purpose, game and ornamental purpose varieties.

UNIT – III

Poultry feeds and its types– Management of Egg Layers – Management of Broilers in large scale farms.

UNIT – IV

Poultry diseases viral, Bacterial, fungal, Protozoan and parasitic Lice. Prevention and precautions during vaccination.

UNIT – V

Management of a modern poultry farms – Progressive plans to promote poultry as a self employment and **marketing**.

Reference Books:

Jull Morley, A. 1971: Poultry Husbandry, Tata –McGraw Hill Publ. Co New Delhi – India.

Sastry, Thomas and Singh, 1982: Farm Animals Management and Poultry production – Vikas Publ.co. New Delhi – India.

Harbans Singh and Earl.N. Moore, 1982: Live stock and poultry production – prentice hall IndiaPubl. Co., New Delhi – India.

Banarjee, G.C. 1986: poultry, Oxford – IBH publ. co., New Delhi – India.

SEMESTER IV

PAPER – 4

GENETICS AND BIOTECHNOLOGY

Objectives:

Genetics

To acquire knowledge about genetical characters.

To know the principles of genetics, pedigree analysis and population genetics.

To learn genetic studies in man and applied aspects in Genetics.

Biotechnology

To integrate biology with technology. To study the application of Genetic engineering in the processing of materials by biological agents.

GENETICS

UNIT – I

Introduction to genetics – Basis of Mendelian Inheritance and Mendelian Laws – Interaction of Genes – Complementary Factors, Inhibitory and lethal Factors – Atavism. **Multiple Alleles** – Blood Groups and their Inheritance in Human. **Pedigree analysis** in human traits.

UNIT – II

Linkage and crossing over – Drosophila – Morgan's Experiments - Cytological Evidence for Crossing Over. **Sex determination and sex linkage** in Drosophila and Man. **Non – Disjunction and Gynandromorphs**– Cytoplasmic Inheritance– Maternal effect on Limnaea [shell coiling], **Fine Structure of Gene** – Cistron – Recon, Muton – **Gene Regulation** – Operon concept – Lac Operon.

UNIT – III

Mutation – chromosomal Aberrations – examples from Human.

Applied Genetics – Animal Breeding – Heterosis, Inbreeding, Out breeding, Out Crossing, Hybrid Vigour. **Population Genetics:** Hardy weinberg Law – factors affecting Hardy Weinberg Law.

BIOTECHNOLOGY

UNIT – IV

Definition – Scope and applications – isolation of DNA – cloning – Tools of Genetic Engineering – Enzymes, Linkers and Adaptors, Cloning vectors, [plasmids, pBr322, Phagel, Cosmids and phagemids]. Techniques of Genetic Engineering _ recombinant DNA Technology and gene Cloning in prokaryotes [**cDNA and Genomic Library**].

UNIT – V

Transgeneic plants and animals – DNA finger printing – gene therapy – biocensors – biochips - **Application of Recombinant DNA technology** in Medicine & Agriculture – Socio economic issues of Biotechnology in India

Reference Books:

- Verma, P.S. and V.K. Agarwal, 1995 Genectis, 8th edition, S. Chand & Co, New Delhi – 110 055.580pp.
- Gunther S. Stent, 1986. Molecular Genetics. Macmillan Publishing Co Inc. 773pp.
- Higgins II, Best GJ and Jones J [1996] Biotechnology – Principles and application Black well scientific Publication Oxford London.
- Gupta P.K. Elements of Biotechnology [2001] Rastogi publication, Meerut.
- Dubey 2006 Text Book of Biotechnology S. Chand & co. New Delhi.
- Gardener. 1991. Principles of Genetics. 8th edition. John wiley & sons Inc. New York. Chichester, Brisbane, Toronto, Singapore.
- Monroe. W. Strick Berger 2004 Genetics. Printice Hall of India New Delhi.
- Kumar H. D. 1998 A text book of Biotechnology, affiliated East West pvt. Ltd., New Delhi.
- Nicholls. 2002 Genetic Engineering, Cambridge University Press. UK.
- S. Gladis Helen Hepsyba and CR. Hemalatha 2009 Basic Bioinformatics MJP Publ. Chennai.
- Vijayaraman, Chellammal K.S and Manikkili. P 1998. Uyiriyae Thozhilnutpam. Chimeeraa, Trichy.

CORE PRACTICAL – II

CELL AND MOLECULAR BIOLOGY, GENETICS AND BIOTECHNOLOGY

CELL AND MOLECULAR BIOLOGY

Cytometry

Compound microscope, camera Lucida, Stage and Ocular Micrometers

Blood Smear Preparation – Differential count of W.B.C.

Total count of RBC using Haemocytometer.

Total count of WBC using Haemocytometer.

Slide Preparation

Mounting of Buccal Epithelium.

Mitosis in onion root tip squash.

Squash preparation of Grass hopper testes.

Study of prepared slides of histology.

Columnar Epithelium, Ciliated epithelium, Glandular Epithelium. Cartilage T.S., Bone T.S., Cardiac Muscle, Striated muscle, Non Striated muscle, Neuron, Male germ cell, Female germ cell.

GENETICS

Squash preparation of Salivary glands of chironomous larva.

Male & Female identification.

Observation of common Mutants of Drosophila.

Human Blood Grouping analysis.

BIOTECHNOLOGY

Study of prepared slides, Models or specimen.

Escherichia coli, Bacteriophage, Plasmid.

Demonstration of P.C.R technique: Southern blot, Electrophoresis.

Visit to Biotechnology lab and Report – compulsory.

SKILL BASED SUBJECT
PAPER – 2
A. BIOFERTILIZER PRODUCTION

Objectives:

To impart awareness on biofertilizer technology

To create knowledge on Environmental degradation

UNIT – I

Scope and principles of Biofertilizers – Types of soil – physical and chemical composition of soil. Types of microorganisms in soil.

UNIT – II

Production of bacterial biofertilizers – Mass production and utilization of different strains of cyanobacteria. Mass cultivation of Azolla and its utilization.

UNIT – III

Isolation and identification of endophytic nitrogen fixers. Rhizobium and legume root nodulation and Nitrification process.

UNIT – IV

Production of Micorrhizal Biofertilizer– Phosphate solubilising microorganisms – Arbuscular vesicular Mycorrhizal (VAM) fungi as biofertilizer and its applications

UNIT – V

Use of composite Biofertilizers – Methods for enhancing soil fertility. Renewable properties of biofertilizers. The cost / benefit analysis of production and application of biofertilizers.

Reference Books:

Singh, T. and Purohit, S.S. 2008: Bio fertilizer Technology, Agrobios– India

Sharma, A.K. 2007: Bio fertilizer for sustainable agriculture – Agrobios – India

Pandiyarajan, P. 2008: Techniques in Agricultural Microbiology – Agrobios – Jodhpur – India.

Purohit, S.S. 2005: Microbiology – Fundamentals and Application [6th edition] student edition – Jodhpur – India.

Dubey, R.C., and Maheswari, D.K. 2007: A text book of microbiology – S. Chand & co., New Delhi, India.

PAPER – 2

B. APICULTURE

Objectives:

To acquire knowledge of honey bees and their social values.

Entrepreneur motivation for practicing apiculture as cottage industry.

UNIT – I

History – Biology and classification of honey bee, species of honey bees, Social organization of honey bee colony – Swarming and pheromones

UNIT – II

Bee hive – Flora for apiculture – selection of Bees for apiculture, Method of bee keeping – Indigenous method of extraction of honey. Care and management of honey bee hive

UNIT- III

Modern method of apiculture – appliances for modern method, Diseases of honey bee and control measures.

UNIT- IV

Products of bee keeping: Honey – bee wax bee venom – Honey. Production, chemical composition – Economic importance of Honey bee wax.

UNIT – V

Bee enemies - Bee Keeping industry – Recent Efforts – Modern method in employing honey bees for cross pollination in horticultural gardens.

Reference Books:

M.S. Nalina Sundari 2006, Entomology M.J.P Publications, Chennai

Sardar singh, Bee keeping in India.

Sharma.P.L., & Singh S. Hand Book of Bee Keeping.

Honey – A Comprehensive survey – International Bee Research Association for House – CNRC [England]

Roger. A. Morse, 1990. The ABC & XYZ of Bee culture, 40th ed., A.I Root & Co, Medina, Ohio 44256. 516pp

**NON – MAJOR ELECTIVE
PAPER – 2
A. SERICULTURE**

Objectives:

To impart training on silk worm culture technology.

To create knowledge on self employment opportunity.

UNIT – I

Introduction – importance of sericulture– Mulberry plant - Classification of commercial varieties of mulberry. Mulberry plant cultivation practices.

UNIT – II

Classification and Biology of silk moth – familiar and economically important types of silkworms – life cycle study of *Bombyx mori*. Diseases of silk worms – fungal, bacterial, viral and nematode diseases, deficiency diseases and their remedial measures.

UNIT – III

Tools of sericulture– cultural methods and management of mulberry silk worms - Silkworm rearing operations – Chawki rearing and late age rearing techniques.

UNIT – IV

Harvesting methods- Physical and commercial characters of cocoons. Reeling operations, importance of by – products of Sericulture.

UNIT – V

Economics of Sericulture – Future and progress of sericulture in India. Role of State and central silk board – employment opportunities - Prospects of sericulture as self Employment as cottage industry

Reference Books:

Ganga, G. 2003: comprehensive sericulture Vol-I, Moriculture – Oxford –IBH Publ. Co. India.

Ganga, G. 2003: comprehensive sericulture Vol –II Silkworm rearing – Oxford – IBH Publ. Co. India.

Ganga, G. and Sculochana Chetty, J. 1997: An Introduction to sericulture Oxford – IBH Publ. Co. India.

PAPER – 2
B. AQUARIUM FISH KEEPING

Objectives:

To impart training on Aquarium fish keeping technology.
To create knowledge on self employment opportunity.

UNIT – I

The potential scope of Aquarium Fish industry as a Cottage Industry. Exotic and Endemic species of Aquarium Fishes.

UNIT – II

Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel Fish, Blue Morph, Anemone fish and Butterfly fish.

UNIT – III

Food and feeding of Aquarium fishes – use of live fish feed organisms. Preparation and composition of formulated fish feeds.

UNIT – IV

Live fish transport – Fish handling, packing and forwarding techniques.

UNIT – V

General Aquarium maintenance – budget for setting up an aquarium fish farm as a cottage industry.

Reference Books:

Jingran V.G., 1991: Fish and fisheries in India – Hindustan Publ. co New Delhi – India.
Shanmugam K. 1992, Fishery Biology and Aqua Culture – Leo Pathipagam – Chennai-India.
Mill Dick, 1993: Aquarium fish, DK Publ.Co,Inc. New York –USA
Yadav. 1995: Fish and fisheries, Daya publ. co., New Delhi – India
Hall, C.B. 2005: Ponds and Fish culture – Agrobios – Jodhpur – India.
Day,F. 1978: Fishes of India Vol. I & II, William Danisan & Sons, India.

SEMESTER V

PAPER – 5

BIostatISTICS AND BIOinformatics

Objectives:

To get a basic knowledge of statistical methods and computations in biology.

To study the application of information sciences [mathematics, statistics and computer sciences] in biology.

To study the application of information technology to the management and analysis of biological data.

BIostatISTICS

UNIT – I

Definition and Scope, Census and sampling methods – collection and presentation of data. Diagrams and graphs; bar, pie Histogram, Line graph – concept of Statistical population and sample characteristics of frequency distribution.

UNIT – II

Measures of central tendency: mean, median and mode. Measures of Dispersion, Range, Quartile deviation, mean deviation & Standard deviation. Test of significance (t- Test).

BIOinformatics

UNIT – III

Introduction – computer – types of modern computers – operating systems – applications of MS-WORD, MS.EXCEL and MS-PPT- Documentation and Presentation of Bio Statistical data– Browsers – search engines - Use of Internet, Messenger and E-mail – Basic Knowledge of Medical transcription.

UNIT- IV

Biological databases – definition – Literature databases- NCBI – Pubmed, Medline, Protein and Nucleic acid Sequence databases and their relationship – PIR, Swiss – Prot, GeneBank, DDBJ – Structural Databases – PDB, SCOP, CATH, Structural visualization tools, RasMol, Swiss PDB viewer.

UNIT – V

DNA and RNA sequencing - Pairwise sequence Alignment –Scoring Matrices - PAM and BLOSUM- statistics of alignment scored Dot Plot – local and global alignment – Database searching – FASTA and BLAST multiple sequence alignment clustal W- Phylogenetic Tress – PHYLIP.

Reference Books:

Statistics – SP Gupta 1996 S. Chand and Co., New Delhi.

Jerold H. Zar Bio Statistical analysis [2nd edition] printice Hall of International edition, 1984

[Relevant portions]

Goutham Roy. Introduction to Computing and computing lab and Cad [2002] Books and allied [pvt]ltd. Kolkata.

MS. OFFICE for Win – Microsoft office press. Developing Application with MS-OFFICE _ Christine. Solomon – Microsoft Office Press.

Developing Bioinformatics Computer Skills Cynthia Gibbs, Sheoff Publishers & Distributors Pvt.Ltd., Mumbai.

Arthur. M. Lesk, Introduction to Bioinformatics, Oxford University Press, New Delhi, 2003

Arthur. M. Lesk, Introducton to protein Structures Oxford University Press, New Delhi, 2000

Baxevanis, A and Outllette. Bioinformatics a practical guide to the analysis of genes and proteins, Willy – Interscience, Hoboken, NJ. USA 2005

PAPER – 6

DEVELOPMENTAL BIOLOGY & IMMUNOLOGY

Objectives:

- To study ontogenesis, the development of animals including parthenogenesis.
- To study embryonic adaptations, human reproduction and reproductive technology in man.
- To study the process of immune response and mechanism.
- To understand the advances in Immunology.

DEVELOPMENTAL BIOLOGY

UNIT – I

Gametogenesis – Fertilization - polarity & symmetry of eggs – types of eggs – Fertilization Mechanism, Physiology & theories – parthenogenesis – Natural – artificial – Experiments on Artificial Parthenogenesis.

UNIT – II

Cleavage – Factors influencing cleavage – fate map – blastulation and gastrulation in amphioxus, frog and chick – Experimental works of Spemann and Mangold- Development of brain and eye in frog.

UNIT – III

Embryonic adaptations; Embryonic membranes and their functions in chick – placentation in mammals. Puberty – Menstrual cycle-contraception – family welfare reproductive technology; Artificial insemination - cryopreservation - IVF - Embryotransfer – Test tube babies – Bioethics.

IMMUNOLOGY

UNIT- IV

Introduction - **Lymphoid organs**, cells of immune system – their role in immune response – Antigen – Antibody reaction. Types of immunity – their role in parasitic, bacterial & Viral Infection, in hyper – sensitivity and graft rejection.

UNIT – V

Immunoglobulin – types, structure, Physico chemical and biological properties – Immunoprophylaxis – Immunization schedule of children. Immuno deficiency – AIDS, Immunotechniques.

Reference Books:

- Balinsky, B.L., 1981. Introduction to embryology Saundeers, Philadelphia.
- Berril & Corp Developmental Biology. McGraw Hill Book Company, MC.,New York.
- M.S.Jayaraj An Introduction to embryology Veer Bala Rastogi Publication.
- Verma, P.S., V.K. Agarwal and Tyagi, 1995. Chordate embryology. S. Chand & co., New Delhi.
- Majumdar, N.N. 1990. Text Book of Vertebrate embryology. Tata McGraw – hill Publishing company Ltd. New Delhi.
- McEwen, R.S., 1969. Vertebrate Embryology. Oxford and IBH Publishing Co., New Delhi.
- Jain, P.C 1998, Elements of Developmental Biology. Vishal Publication, New Delhi.
- Dubey 2006 Text book of Biotechnology S. Chand and Co., New Delhi.
- Roitt.I.M 2000 Essential Immunology, Blackwell Scientific Publishers.
- Paul, W.E.M. 1989, Fundamental Immunology, Raven Press, New York.
- Kuby. J.1999, Immunology. W. H. Free man and Co. New York.
- Current protocols in Immunology – 3 Volumes 1994 Wiley Publications.
- Roitt. I, Brostoff, J. and Male. D. 2002. Immunology, Mosby, New York.
- Richard, A. Golds, Thomas I, Kindt & Barbara A. Osborne 2000 Kuby Immunology, Freeman and Co. New York.
- Madhavee Latha. P, 2012. Text book of Immunology, S. Chand & Company.

PAPER – 7

ANIMAL PHYSIOLOGY

Objectives:

To emphasize the basic needs of macromolecules of food and their importance.

To study the basic principles of animal Physiology.

To understand the physiology of various organs and organ systems.

UNIT – I

Nutrition and Digestion

Introduction– Food requirements – Carbohydrates, proteins, fats, minerals, and vitamins.

Digestive enzymes and their role in digestion – absorption and assimilation.

UNIT – II

Respiration and Circulation

Introduction – Respiratory Pigments and functions. Transport of gases [Co₂ and O₂] – Respiratory quotient. Circulation Types, Composition, Properties and Function of Blood – Human – Cardiac Cycle – Cardiac Rhythm – Origin of heart Beat – Regulation of heart Beat – ECG – Blood Pressure – Factors Contributing to heart Problems – coronary circulation.

UNIT – III

Excretion and Osmoionoregulation

Introduction – kinds of excretory products – Kidney - structure and Mechanism of urine formation in mammals, hormonal regulation of excretion. Kidney failure and Transplantation. Osmoionoregulation in fishes and mammals.

UNIT – IV

Neuromuscular Co-ordination

Nervous tissue – Neuron – Structure, types of neurons. Nerve impulse – Synapse – Synaptic transmission of impulses – Neurotransmitters. Muscles – Types of muscles – Muscle Proteins – Mechanism of contraction – Cori cycle – Theories of muscle contraction.

UNIT – V

Receptors and Endocrine system

Receptors – Photoreceptor – mammalian eye –structure of retina – visual pigments – physiology of vision – phonoreceptors – mammalian ear- Organ of Corti – working mechanism – phonoreception in bat.

Endocrine glands – structure, secretions and functions of endocrine glands of vertebrates – Pituitary, Hypothalamus, Thyroid, Parathyroid, Adrenal, Thymus, Islets of langherhans, Sex organs.

Reference Books:

- Sambasivaiah, Kamalakara rao and Augustine chellappa 1990. A Text book of Animal physiology and ecology, S. Chand & co., Ltd., New Delhi – 110 055.
- Parameswaran, Anantakrishnan and Ananta Subramanyam, 1975. Outlines of Animal Physiology, S. Viswanathan [printers & Publishers] Pvt. Ltd.
- William S. Hoar, 1976. General and comparative physiology, prentice Hall of India Pvt. Ltd., New Delhi. 110 001.
- Wood.D.W, 1983, Principles of Animal Physiology 3rd Ed.,
- Prosser,C.L. Brown, 1985, Comparative Animal Physiology, Satish Book Enterprise, Agra – 282 003.

ELECTIVE

PAPER – 1

A. BIO-INSTRUMENTATION

OBJECTIVE:

To acquire the knowledge of basic principles and applications of biological instruments.
To know the techniques for the measurement of physical, physiological, biochemical and biological factors in man and other living organism.
To motivate the applications of biological instruments in the field of research.
To analyze the results obtained from the biological tools for the sample

UNIT – I

Introduction of biological methods and instruments. Units of measurements – metric system conversion of units, Microscopy – principles & types [simple, light, phase contrast, polarizing dark field & electron] Autoclave- principle & application and types.

UNIT – II

Centrifuge – principles & types [Clinical centrifuges]-sample preparation. **pH** – Sorenson's pH Scale, pH meter -Principle and applications. **Manometry**, Warburg Manometer – Principle & working.

UNIT – III

Chromatography – principle types [paper, Thinlayer, column] and applications, **Electrophoresis** – principles, types – paper & gel [AGE & PAGE] and applications.

UNIT – IV

Spectroscopy – principles & use of **Colorimetry and NMR** [Nuclear Magnetic resonance] spectroscopy; Radio isotopic technique – Radio Immuno assay Biochemical application of radio isotopes.

UNIT – V

Biosensors principle - types [Enzyme, Bacterial electrodes, environmental bio sensors & Bioreporters & application] DNA & RNA sequencing methods, **PCR** – Principle & application. **DNA Micro array** and its application.

Reference Books:

Veerakumari,L, 2006. Protein sequencing in bio informatics bioinstrumentation, MJP publ. Chennai.
W.W.Unbriet, Z.H. Burri and Stamffier J.F. Manometric and Biochemical techniques, 5th Ed. Burges Pub.Co. Minneapolis 1972.
Biophysics : An introduction, R.M.J Cottenill John Wiley & Sons Ltd, England.
M.A.Subramanian 2005, Biophysics (Principles and Techniques) MJP publishers, Chennai.
A.Upadhyaya, K.Upathyaya and N.Nath, (2003) Biophysical chemistry, Principles and Techniques,3rd Ed, Himamalaya publishing house.
H.B.Bull, F.H.Davis, An introduction to physical Biochemistry 2nd Ed, Philadelphia 1971.
Gurumani.N 2006. Research methodology for biological sciences MJP publ. Chennai.

B. HUMAN ENDOCRINOLOGY

Objectives:

To understand the structure and functions of endocrine glands in human.

To learn about the hormonal regulation and their defects in human.

UNIT – I

Pituitary Gland

Classification and characteristic features of hormones. Structure of hypothalamus and pituitary Gland – Hormones of Adenohypophysis, Pars intermedia and Neurohypophysis. Effects of hypo and hyper secretions - Hypothalamic regulation for release of pituitary hormones.

UNIT – II

Thyroid and Parathyroid

Structure of thyroid Gland – Biosynthesis of thyroid hormones. Biological functions of Thyroxine, Regulation of Thyroid secretion Thyroid Dysfunction – parathyroid Glands Biological Action of parathyroid Hormones – Parathyroid Dysfunction

UNIT – III

Adrenal gland

Structural features- hormones of Adrenal medulla and Cortex and their functions - Biological Action of Adrenaline and Noradrenaline – Emergency Hormones.

UNIT – IV

Islets of Langerhans

Islets of Langerhans histology – hormones Insulin and Glucagon – Biosynthesis of Insulin- Regulation and Mechanism of Action.

UNIT – V

Testes and ovaries

Male reproductive system – Hormonal control of testes Chemistry and Biosynthesis of Testosterone – functions of testosterone Female reproduction system – role of Hormones in Female sexual Cycle Placental hormones – parturition – Lactation.

Reference Books:

Mac E Hadley, 1992 Endocrinology, Third edition, prentice Hall, New Delhi Jersy

Matsumoto A. and Ishi S., 1992 [eds]. Atlas of endocrine organs, vertebrates and invertebrates springier verlag, germany.

Wilson J.D and Foster D.W 1992, William's textbook of endocrinology, 8th edition, WB saunders company, Philadelphia.

World health organization Technical report series, 1992, Oral contraceptives and Neoplasia WHO, Geneva.

Turnerm C.D and Bagnarr, J.T., 1994, General Endocrinology, 6th edition, WB saunder's company, Philadelphia [saunder's international students edition]

Lamming, G.E. 1984. Marshll,s Physiology of Reproduction; Reproductive cycles of vertebrates. Churchill livingstone, Edinburgh.

Prakash S Lohar Endocrinology, Hormones and Human Health.

SKILL BASED SUBJECT

PAPER – 3

A. PISCICULTURE

Objectives:

To introduce basic knowledge of fish culturing methods and techniques.

UNIT – I

Scope of Aquaculture. Importance of cultivable fresh water, Marine and ornamental species, maintenance of aquarium , Exotic fishes.

UNIT –II

Fish farm Maintenance – Farm management technique, water quality, temperatures and accessories in farm management viz Aerator, filter, paddler.

UNIT – III

Fish culture technique: Monoculture, Polyculture and Monosex culture, Induced fish breeding, integrated fish farming.

UNIT –IV

Fish nutrition and fish feed formulation, live fish handling and transport.

UNIT – V

Prevention and control of fish diseases.

Reference Books:

Jhingran V.G. 1985, Fish & Fisheries of India, Hindustan Publishing Co. New Delhi. 666p
Trivedi K.K [Ed] 1986 Fisheries Devt. 2000 AD. Association of India fisheries industries, Oxford & IBH, New Delhi 268pp.

PAPER – 3

B. MUSHROOM CULTURE

Objectives:

To emphasize the importance of integrating new knowledge on food biotechnology.

To update the technological innovations of edible mushrooms and their application in Nutrition.

UNIT – I

General characters and classification of Edible Mushrooms. Scope and development - Food Biotechnological innovation on diets.

UNIT – II

Identification of useful and harmful mushroom. Preparations for mushroom culture – Bed

preparation – Nutrients preparation climatic conditions and parameters, spawn preparation for laboratory and industrial Mushroom culture.

UNIT – III

Culturing methods of common Edible Mushrooms *Agaricus campestris*, *Agaricus bisporus*, *Morechella esculanta*, *Volvarella volvacea*. Preservation and processing of mushrooms

UNIT – IV

Nutritive values of Edible Mushrooms – Chemical compositions – Carbohydrates, proteins, Lipids, Vitamins and organic acids – Nutrient supplements for Human consumption as vegetable meat.

UNIT – V

Diseases of mushroom – Bacterial (bacterial rot, brown spot and yellow blotch) – fungal (dry bubble, wet bubble and cob web) and pest (beetles and nematodes). Marketing and self employment aspects.

Reference Books:

- Kumarasan, V.2001: Biotechnology Saras Publ. Nagercoil – India
Ranga, M.M 2005; Animal Biotechnology, Students Edition, New Delhi, India.
Reddy, D.V. 2006: Principles of Animal Nutrition and Feed.
Technology – Oxford IBH Publ. New Delhi, India.
Dubey, R.C. 2006: A Text Book of Biotechnology, S. Chand & co, India.
Purohit, S.S. 2005: Biotechnology, Student edition, New Delhi – India.
Singh, Ritti: 2005: Modern Mushroom Cultivation – Agrobios.
Suman, B.C. 2007: Mushroom cultivation, Processing and uses agrobios - India
Dey, S.C.2008: Mushroom Growing – Agrobios – India.
Pathak, V.N. 2007: Mushroom Production and Processing Technology – Agrobios – india.
Sharma, V.P. 2006: Diseases and pests of mushrooms Agrobios – India.

SEMESTER VI
PAPER – 8
ENVIRONMENTAL BIOLOGY

Objectives:

To create awareness towards recent changes in the environment and preventive measures.
To realize the importance of inter relationship between every organism and environment.
To study the impact of eco factors on the morphology & distribution of organisms.

UNIT – I

Scope – concept – Branches in ecology – Autecology, synecology - types of media and substratum and their influences on animals – **Water:** Properties, Forms of water, Soft and hard water. **Air** composition – properties. **Substratum:** Soil -Types, soil formation, soil group of India, soil profile.

UNIT – II

Biosphere – Hydrosphere – Lithosphere – Atmosphere – temperature: Distribution of temperature, thermal stratification – Temperature as a limiting factor, thermal adaptations. Light as a limiting factor. Pressure gravity, Moisture and humidity. Liebig's law minimum, Shelford's law of tolerance.

UNIT – III

Biogeochemical cycles – gaseous cycle [C,N₂ & S] sedimentary cycle, [phosphates]. **Animal association** - Intra specific and inter specific - colony formation, social organization, predation, parasitism, commensalisms, mutualism, inter specific competition – competitive principle or Gause's principle.

UNIT – IV

Population: Definition – characteristics – Natality, Mortality, age distribution of Population growth forms, population fluctuation. Community Ecotone and edge effects – ecological succession. Conservation - **Wild life management**, Preservation – laws enforced – sanctuaries, National parks. **Natural resources management:** renewable and non-renewable.

UNIT – V

Environmental degradation – deforestation, urbanization, population explosion and other environmental hazards – Environmental ethics and laws – Earth summits – role of governmental agencies for environmental monitoring.

Reference Books:

Kotpal. R.L, and N.P. Bali, 1986. Concepts of Ecology, Vishal Publications, New Delhi – 7
Rastogi V.B, and M.S. Jayaraji, 1988 – 1989. Animal Ecology and Distribution of animals, Kedar nath, Ram Nath Meerut – 250 001.
Clark, G.L. 1954, Elements of Ecology, John wiley & Sons Inc., New York, London.
Ananthakrishnan, T.N, and S. Viswanathan, Principles of Animal Ecology.
Eugene P. Odum, 1971. Fundamentals of ecology, Saunders International Student Edition, W.B. Saunders Company, Philadelphia London, Toronto.
Verma, P.S and Agarwal 1986, Environmental Biology, S. Chand & Co Ltd.
Richard, Manual of wild life conservation.

PAPER – 9

ECONOMIC ZOOLOGY

Objectives :

To inculcate knowledge on useful animals to Mankind.

To generate motivation for self-employment.

To disseminate information on economic aspects of zoology.

UNIT – I

Vermiculture: Methods of composting.

Apiculture - Species of Honeybees –Honey extraction – Economics of Apiculture and management.

Sericulture – Nature and economic importance of sericulture in India.

UNIT –II

Prawn culture – Culture techniques of fresh water [*Macrobrachium rosenbergii*] & Marine water (*Penaeus monodon*)

Pearl culture: Formation and nature of Pearls – Commercial importance of Pearl Culture in India.

Pisciculture– Techniques of induced breeding, commercial culture of catla & catfish, By-products of fishing and its commercial values.

UNIT – III

Poultry- Morphology of different breeds of Chicken – Brooding and Rearing of Chicks – Processing of Egg, Meat and By-Products of Poultry.

UNIT – IV

Dairy farm - management, Milch breeds. Draught Breeds, Dual Purpose breeds and New cross Breeds of Cows and Buffaloes in India.

Sheep farm: Indigenous and Exotic breeds of sheep

UNIT – V

Future strategies for Livestock Development – Transgenic animal Technology – Genetic Improvement for best Breeds – Economic importance of Dairy, Leather, Wool, Fur and Pharmaceutical Industries in India.

Reference Books:

- Sukla, G.S. and Upadhyay, V.B., 2000 Economic Zoology – ISBN – 81- 7133 -137 -8
Rastogi Publication, Meerut, India
- Jawaid Ahsan and Subhas Prasad sinha – 2000 A Handbook on Economic Zoolgy - ISBN – 81 – 219- 0876 – 0 S. Chand & co., Ltd., New Delhi.
- Ashok Kumar and Prem Mohan Nigam, 1991 Economic and Applied Entomology Emkay Publication, New Delhi.
- Shammi,Q.J. and Bhatnagar, S., 2002 Applied Fisheries: ISBN – 81 – 7754 – 114 – 5
Agrobios [India], jodhpur - India
- Major Hall, C.B. 2005 Ponds and Fish culture – ISBN – 81 – 7754- 146 – 3
Agrobios [India], jodhpur - India
- Keith Wilson, N.D.P., 2005 A Handbook of Poultry Practice – ISBN – 81 – 7754 -0- 69- 6
Agrobios [India], jodhpur - India
- Banerjee, G. C. 1992 Poultry – III – Edition – ISBN – 81 – 204 – 008 – 4
Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Banerjee, 1988 A text book of Animal Husbandry – VIII- Edition – ISBN – 81- 204 – 1260 -5 Oxford & IBH Publishing co. Pvt. Ltd., New Delhi.
- Kaushish, S.K., 2001 Trends in livestock Research – ISBN – 81 – 7754 – 112 - 9
Agrobios [India], jodhpur - India
- Ismail, S.A1997. Vermicology the Biology of Earth worm orient Longman, India.
- A. Mary Violet chrishty 2008 Vermi techonology MJP Publ. Chennai.

PAPER – 10

EVOLUTION

Objectives:

To understand the concepts of origin of life.

To comprehend the scientific concepts of animal evolution through theories and evidences.

UNIT – I

Evidences: The need of evidences for the fact of evolution – Morphological, anatomical, Embryological, Physiological and Biochemical evidences.

UNIT – II

Theories: Lamarckism, Neolamarckism, Darwinism, NeoDarwinism, Devries concept of Mutation.

Modern version of Mutation theory.

UNIT – III

Natural selection: Types, stabilizing and diversifying directional selection. **Variation:** Types of variation.

UNIT-IV

Mimicry – Batesian and mullerian mimicry and evolution, living fossils. Distribution of animals.

UNIT – V

Isolation – Premating and post mating isolating mechanism, speciation. **Evolution of man** – Biological and cultural.

Reference Books:

Agarwal, V.K and Usha Gupta – Evolution and animal distribution, Chand and Co.,
Dodson, E.O. 1990. Evolution, Reinhold, Newyork.

Francisco, J. Ayla – Evolution, Surject publication.

Gopalakrishnan, T.S. Itta Sambasivaiah and A.P. Kamalakara Rao. Principles of organic
Evolution,

Himalaya publishing house.

T.K. Ranganathan, Evolution. 1994 Rainbow Printers, Palayankottai.

Veer Bala Rastogi. Organic Evolution, Meerut Publications.

Arumugam, N. Organic Evolution, 2009 Saras. Publ. Nagarcoil, Kanyakumar Dt.

CORE PRACTICAL – III

BIostatISTICS, ANIMAL Physiology, Developmental Biology and Immunology

BIostatISTICS:

Biological data – calculation of mean, median, mode, Mean and standard deviation.

Graphical representation – Bar, Pie, frequency distribution.

Demonstration of MS- word, MS-Excel and MS-PPT.

ANIMAL Physiology:

Activity of human salivary amylase in relation to Ph, Enzyme concentrate and Temperature.

Estimation of Oxygen consumption in a fish with reference to body weight.

Detection of nitrogenous waste products in fish tank water, frog tank water, bird excreta and mammalian urine/ Kidney.

Use of Kymograph Unit, B.P. apparatus, stethoscope.

DEVELOPMENT BIOLOGY:

Study of the following prepared slides / museum specimens.

Section of testis and Ovary [Mammalian].

Slides of Mammalian sperm and ovum.

Study of Egg types – Frog's Egg, Hen's Egg.

Study of cleavage stages 2 Cell, 4Cell, 8Cell – Blastula and gastrula of Frog.

Slides of different stages of chick embryo – 18 hours [primitive streak stage], 24 hours, 48 hours 72 hours and 96 hours.

Placenta of Sheep, Pig and Man.

IMMUNOLOGY:

Study of Antigen – Antibody reaction – Human Blood grouping [ABO and Rh].

Study of prepared slides of histology: Thymus, Spleen, Bone marrow, Lymph node.

CORE PRACTICAL – IV

ENVIRONMENTAL BIOLOGY, ECONOMIC ZOOLOGY AND EVOLUTION

ENVIRONMENTAL BIOLOGY:

Estimation of Dissolved oxygen, salinity, pH, Free CO₂, Carbonate and Bicarbonates in water samples.

Use of rain gauge, Maximum and Minimum thermometer, Hygrometer and Anemometer.

Plankton study – fresh water and Marine plankton.

Study of natural ecosystem and field report.

ECONOMIC ZOOLOGY:

Study of the following prepared slides / specimens.

Earthworm types [any two] – [vermiculture].

Megacolex mauritii – south Indian species – surface crawlers.

Drawida modesta – Redsoil with calciferous gland.

Pheretima posthuma – North Indian – Large specimen.

Eudrilus eugenia – Redworm, Exotic.

Fish parasites [*Lernea*, *Argulus*].

Larvivorous fishes :

Poecelia reticulata – Guppy.

Gambusia Affinis – Gambusi.

Colisa labia – Dwarf gowrami.

Different stage of **Silk worm**.

Types of **Bees**.

Common **Pests**.

EVOLUTION

Fossils – ammonite.

Living fossils – *Limulus*, *sphenodon*.

Conneting link – *peripatus*, *archaeopteryx*.

Evolutionary significance – *exocoetus*, *draco*, *hippocampus*.

Mimicry – monarch butterfly.

Camouflage – chameleon.

**ELECTIVE
PAPER – 2
A. BIOCHEMISTRY**

Objectives:

To study the structure of biomolecules and their importance in the life process.

To define and explain the basic principles of biochemistry.

UNIT – I

Aqueous solutions – properties of water - hydrogen ion concentration, acids bases and their concept – buffers and electrolytes and functions – acidity, alkalinity and pH determination.

UNIT – II

Bioenergetics – energy and its forms – free energy – laws of thermodynamics – enthalpy and entropy – redox coupling and ATP bioenergetics.

UNIT – III

Classification, **metabolism** and biological significance of carbohydrates, lipids, protein–primary, secondary, tertiary and quaternary structure and characteristics of proteins, vitamin types- source & deficiency.

UNIT – IV

Enzymes: classification and nomenclature – Physico-chemical – properties of enzymes – enzyme kinetics – mechanism of enzyme action – factors affecting enzyme activity.

UNIT – V

A brief account on the **biochemistry of antibiotics** & their mode of action. Fractionation of Biological materials by chromatography [PC, TLC] electrophoresis [Principle & types] centrifugation [Principle & Types].

Reference Books:

L. stryer, 1999 Biochemistry IV Edition. Freeman Company, New York

Lehninger, 1992 Biochemistry worth publication Inc., CBS Publication New Delhi.

H.S. Srivastava Elements of Bio Chemistry, Rastogi Publications.

Outline of Biochemistry, Corn & Stump.

Veerakumari.L, 2004, Bio Chemistry, MJP Publications.

G.P. Talwar & L.M. Srivastava, 2003 Text Book of Bio Chemistry and Human Biology Eastern

Economy Edition, Prentice Hall of India. New Delhi.

PAPER – 2
B. APPLIED ENTOMOLOGY

Objectives:

To create awareness towards insect borne diseases.

To study the insect species causing damage to the crops in the field as well as under storage condition and the effective control measure against them.

UNIT – I

Introduction – economic classification of insects - Types of pests – types of damage caused by pests in crops – causes for insects assuming pest status – outbreak of pests.

UNIT – II

Types of insect development – ametabola and metabola (hemi metabola, holometabole, paurometabola and hypermetabola) - Pests of agricultural importance, their bionomics, life cycle and control measures of paddy, ground nut, cotton, tomato, coffee & Banana.

UNIT – III

Pests of stored products and their control – Household pests – cockroach and termites – and their control – pest in relation to public health – rodents and their control. Mosquito borne diseases and their control measures.

UNIT- IV

Pest control methods and application: cultural, mechanical, biological and chemical methods – classification of pesticides – LC 50 and LD 50 values – First Aid & precautions in handling pesticides – pesticide spraying appliances. Residual effects of pesticides on non target organisms.

UNIT – V

Pesticide industry - production and marketing – recent trends in pest control – pheromones, attractants, repellants and chemosterilants Integrated pest management, its importance & applications.

Reference Books:

Vasantharaj David and T. Kumaraswami 1988. Elements of Economic Entomology Popular Book Depot, Chennai.

Nayar, K.K., Ananthakrishnan, T.N. and B.V. David 1992 General and Applied Entomology Tata McGraw, New Delhi.

P.G. Fenemore, Alka Prakash 1997 Allied Entomology, Wiley Eastern Ltd., New York.

Wigglesworth J.B., 1994. Insect Physiology, Chapman and Hall, London.

Temphare D.B., 1984 A. Text Book of Insects Morphology, Physiology and Endocrinology. S. Chand and Co., New Delhi.

**ELECTIVE
PAPER – 3
A. NANOTECHNOLOGY IN LIFE SCIENCE**

Objectives:

To impart current knowledge in Nanotechnology.

To create fundamental understanding of usage of Nanomaterial in life science.

UNIT – I

Scope – Fundamental Understanding of concepts and Methods of Nanotechnology – overview on Nanotechnology and Interdisciplinary field.

UNIT – II

Basic and structural Nanotechnology. Molecular and Macromolecular Levels – Nanoscales – devices and systems developed in Nanotechnology.

UNIT – III

Nanotechnology adopted in **DNA computing**, Molecular Nanotechnology, Quantum Nanotechnology, Optical and Particles used in Nanotechnology.

UNIT – IV

Use of carbon nanotubules, Better and cheaper nanomaterials – Evaluation of nanomaterials and nanosystems by using conventional materials.

UNIT – V

Application of nanotechnology in the fields of Agriculture, Medicine. Future perspectives of Nanotechnology in life Sciences.

Reference Books:

Shanmugam, S.2009 : Nanotechnology, MJP-Publ. Chennai – India.

Kumar,U, W008 : Nanotechnology – A Fundamental Approach – Agrobios – India

Ratner, 2008 : Nanotechnology-A Gentle Introduction to next big idea Tamilnadu Book House, Chennai – India.

Goodshell, D.S, 2004 – Biotechnology : Lessons from Nature – John Wiley & Sons (Asia) Publ.Ltd, Singapore.

PAPER – 3

B. MICROBIOLOGY

Objectives:

To emphasize the importance of integrating new knowledge on Microorganisms.
To update the Technology innovations of Microbial genetics and its Application.

UNIT – I

The scope of microbiology – characterization, classification and identification of Microorganisms.

UNIT – II

Bacteria – General morphology, and physiology – pathogenic and non – pathogenic bacteria, economic importance.

UNIT – III

Micro organisms – general morphology of Fungi – Moulds and yeasts, Algae, Protozoa and Viruses.

UNIT – IV

Epidemiology of infectious diseases with reference to Human – such as Bacterial [Tuberculosis], Viral [Hepatitis], protozoan [Amoebiasis] and Fungal [any one] diseases - Host. Microbe interaction – immune responses – Antibiotics and other Chemotherapeutic agents.

UNIT – V

Applied Microbiology in the fields of food, Agriculture, Industry and environment.

Reference Books:

- Mani, A., Selvaraj, A.M, Narayanan, L.M & Arumugam, N. 1996 : Microbiology – saras publicagtions – Nagercoil – India.
- Sharma,P.D 1998 : Microbiology – Rastogi Publ. Meerut, India.
- Subba Rao, N.S, 1999 : Soil Microbiology, Oxford IBH Co. New Delhi, India.
- Sullia, S.B. & Santharam, S. 2004 – GeneralMicrobiology, Oxford IBH, India.
- Meenakumari,S. Microbial Physiology, MJB-Publ. – Chennai, India.
- Purushotam Kaushik, 2005 : Microbiology – S.Chand & Co., New Delhi, India.
- Vijaya Ramesh, 2005 : Environmental Microbiology, MJP.publ, Chennai, India.
- Vijaya Ramesh, 2007 : Food Microbiology, MJP.Publ. Chennai, India.
- Rajan,S 2007 : Medical Microbiology – MJP.Publ. Chennai, India.
- Mosharaffudin, Ahmed & Basumatary 2006 : Applied Microbiology – MJP Publ. India.
- Purohit, S.S.2007 : Microbiogy – Agrobios Publ. India.
- Trivedi, P.C.2008 : Applied Microbiology – Agrobios Publ. India.
- Prescott, 2009 : Industrial Micobiology – Agrobios Publ. India.
- Parihar, L. 2008 : Advances in Applied Microbiology – Agrobios Publ. India.
- Agarwal, A.K 2008 : Industrial Microbiology, AgrobiosPubl.India.
- Bohra, A.2006 : Fod Microbiology, Agrobios Publ. India.

SKILL BASED SUBJECT
PAPER – 4
A. MEDICAL LAB TECHNIQUES

Objectives:

To impart awareness on Clinical Lab Technology

To create knowledge on Self-Employment Opportunity

UNIT – I

Scope of Medical Lab Technology – General procedures – Cleaning, Sterilization and Disposal of infected materials. First Aid in Laboratories.

UNIT – II

Haematology: Blood collection and Preservation – Blood cell countings of RBC and WBC. Haemoglobin estimation, blood sugar estimation. Basic principles of blood transfusions.

UNIT – III

Bacteria, Virus, Protozoa and Helminth pathogens – Clinical diagnosis of diseases such as Typhoid, Cholera, Tuberculosis, Polio, Measles, Amoebiasis and Filariasis.

UNIT – IV

Biochemical Estimation of Urea, Glucose, Bile salts and Bile pigments in Urine, Microscopic Examination and analysis of ova, cyst and occult blood in stool.

UNIT – V

Clinical Examination of sputum, seminal fluid and Cerebrospinal fluid. Pregnancy test – Awareness and Responsibilities of Code of Ethics for Lab Technicians.

Reference Books:

Samuel, K.M. 1992 : Notes on Clinical Lab Techniques. M.K.G. Iyyer & Sons Publ. Co., Chennai –India.

Dubey, R.C., and Maheswari, D.K.2007; A text book of Microbiology S. Chand and Co. Publ. NewDelhi – India.

Purohit, S.S. 2005 : Microbiology – Fundamentals and Applications [6th Edition] Student Edition –Jodhpur – India.

Mukherjee, 2006 : Medical Laboratory Technology Vol. I, II & III – Tata McGraw Hill Publ.Co., Noida– India.

Ochei, 2000 : Medical Laboratory Science – Theory and Practice – Tata McGraw Hill Publ, Co., -Noida – India.

PAPER – 4
B. INDUSTRIAL FISHERY MANAGEMENT

Objectives :

To introduce basic knowledge of industrial fishery management and export practices.
To realize the need for augmenting food production from aquatic resources.

UNIT – I

Scope of Fisheries, Commercially important Marine, Freshwater and Estuarine fishes.

UNIT – II

Fish harvesting, sorting, grading the catch, stocking in reservoirs. **Fish preservation techniques** - Chilling, Freezing, curing, drying, salting, smoking and canning Fish marketing, fish export potential of India.

UNIT – III

Fish spoilage – causes, autolysis, rigor mortis, chemical spoilage, microbial spoilage and remedies Fish handling, hygiene and fish transport.

UNIT – IV

Quality management, pre requisites and inspection units. **Role of MPEDA** [Marine products Export Development Authority] and **IIP** (Indian Institute of Packaging).

UNIT – V

General unit management and role of **FFDA** [Fish Farmer's Development Agencies].

Reference Books:

S.K.Gupta & P.C.Gupta – 2008 General and Applied Ichthyology (Fish & Fisheries)
S.Chand & Co.,Ltd., New Delhi.
N.Arumugam 2009 Aquaculture Saras Publications Nagercoil, Kanyakumari Dt.

ALLIED PAPERS

1. CHEMISTRY – I

OBJECTIVE:

- Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1 General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Fux, Slag - Definition - Reduction methods - Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

2.1 Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3 Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation - Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons – Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3 , PCl_5 , SF_6 and XeF_6 .

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1 Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking – Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

ALLIED - 2

1. CHEMISTRY – II

OBJECTIVE:

- Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biological functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions - Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1 Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- R_f value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

ALLIED PRACTICAL

CHEMISTRY – 1

VOLUMETRIC ANALYSIS

1. Estimation of HCl – Standard sulphuric acid.
2. Estimation of Borax - Standard Sodium Carbonate.
3. Estimation of NaOH – Standard Oxalic Acid.
4. Estimation of FeSO_4 – Standard FAS.
5. Estimation of Oxalic acid – Standard FeSO_4 .
6. Estimation of FAS – Standard Oxalic Acid.
7. Estimation of Oxalic acid – Standard Oxalic Acid.
8. Estimation of Fe^{2+} using Diphenylamine / N- Phenyl Anthranilic acid as indicator.

ORGANIC ANALYSIS

Systematic Analysis of Organic Compounds containing One Functional Group and Characterisation by Confirmatory Tests.

Reactions of Aromatic Aldehyde, Carbohydrates, Mono and Dicarboxylic acids, Phenol, Aromatic Primary Amine, Amide and Diamide.

REFERENCE BOOKS

- ❖ Inorganic Chemistry - P. L. Soni - Sultan Chand (2006).
- ❖ Inorganic Chemistry - B. R. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
- ❖ Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D. Madan - S. Chand Publications (2008).
- ❖ Text Book of Inorganic Chemistry – R. Gopalan, Universities Press – 2012.
- ❖ Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.
- ❖ Advanced Organic Chemistry - Bahl and Arun Bahl - Sultan Chand and Co. Ltd – 2012.
- ❖ Organic Reaction Mechanisms - Gurdeep Chatwal- Himalaya Publishing House.
- ❖ A Text Book of Organic Chemistry K. S. Tewari, N. K. Vishol, S. N. Mehrotra- Vikas Publishing House – 2011.
- ❖ Principles of Physical Chemistry - B. R. Puri, Sharma and Madan S. Pathania, Vishal Publishing Company – 2013.
- ❖ Text Book of Physical Chemistry - P. L. Soni, O. P. Dharmarha and U. N. Dash - Sultan Chand & Co – 2006.
- ❖ Understanding chemistry – C. N. R. Rao, Universities Press – 2011.

ALLIED - I

BOTANY – I

UNIT-I: Cell Biology

Prokaryotic and Eukaryotic cell (plant cell)

Cell organells - Chloroplast, Mitochondrion and Nucleus.

Cell division – Mitosis.

UNIT-II: Anatomy

Tissues - Meristematic and permanent tissues. Primary and Normal Secondary thickening of Dicot stem.

UNIT-III: Bacteria and Viruses

Bacteria - General characters - shape - flagellation - Structure of E. Coil - reproduction - (Vegetative and asexual), Economic importance. Structure of Tobacco Mosaic Virus, Bacteriophage.

UNIT-IV: Structure and Life History of

a) Chlorella and Gracilaria

b) Albugo, Penicillium and Agaricus

UNIT-V: Structure and Life History of

a) Funaria

b) Lycopodium

c) Cycas

Economic importance of Chlorella, Penicillium and Agaricus.

ALLIED - II

BOTANY – II

UNIT-I: Taxonomy

General outline of Bentham and Hooker's system of classification. Study of the range of characters and economic importance of the following families: Annonaceae, cucurbitaceae, Apocynaceae, Euphorbiaceae and Liliaceae.

UNIT-II: Embryology

Structure of mature anther. Structure of mature ovule and its types. Fertilization.

UNIT-III: Plant Physiology & Plant Tissue Culture

Physiological role of micro and macro elements their deficiency symptoms Photosynthesis - lightreaction - Calvin cycle Respiration - Glycolysis - Kreb's cycle - electron transport system. Growth hormones – Auxins. Tissue culture and its principles.

UNIT-IV: Ecology

Ecosystem - fresh water ecosystem. Environmental pollution. Major pollutants - types of pollution - Air pollution, water pollution, soil pollution - control measures.

UNIT-V: Genetics & Evolution

Mendelism - Monohybrid and dihybrid crosses. Theories of evolution - Lamarckism, Darwinism.

ALLIED PRACTICAL BOTANY – I & II

Description of plants in technical terms belonging to the families mentioned in the theory part.

To study the internal structure of Anatomy material, Pteridophytes and Gymnosperms.

Identification and Description of Micro Preparation materials mentioned in the theory part.

Description of experimental setup of plant physiology.

BOOKS SUGGESTED

Ashok Bendre, A.K. and Pandey P.C. (1975) Introductory Botany. Rastogi Publication Meerut.

Ganguly, A.K. and Kumar. N.C. (1971) General Botany Vol. I & Vol. II, Emkay Publication, Delhi.

Rev. Fr. Ignacimuthu, S.J. (1975) Basic Biotechnology – Tata Mcraw till publication co., New Delhi.

Rao, K.N. Krishnamoorthy, K.V. and Rao. G. (1975) Ancillary Botany. S. Viswanathan Private. Ltd., Chennai.

ALLIED – 1
ECONOMIC ENTOMOLOGY – I

Objectives:

To study the insect pests and their control measures.

To study the economic importance of insects as vectors, pollinators, predators & parasites.

UNIT – I

Classification of insects [Major orders]

Biology of Butterfly

UNIT – II

Beneficial insects. Mode of life, economic importance and development.

Honey bee

Silk worm (*Bombyx Mori*)

Silk worm [*Bombyx mori*] rearing

Equipment required

Rearing procedure to harvesting of cocoons.

UNIT – III

Harmful insects

An account of any three pests of :

1. Rice
2. Cotton
3. Coconut

UNIT – IV

Principles and method of pest control – conventional, Physical, Mechanical, Chemical and Biological control

UNIT – V

Vector borne diseases. A brief account of insect vectors affecting the health of man and domestic animals.

Reference Books:

B. Vasantharaj David and T. Kumaraswami 1982. Elements of Economic Entomology, Popular book Depot, Chennai.

Nayar, K.K., Ananthakrishnan, T.N. and B.V. David, V 1992 General and Applied Entomology Tata McGraw, New Delhi.

P.G. Fenemore Manual. Silkworm Rearing. FAO Agricultural Service Bulletin, Rome.

ALLIED – 2
ECONOMIC ENTOMOLOGY – II

Objectives:

To study the basic concepts of pesticides and integrated pest control

UNIT – I

Insects and their interrelations with environments, insects as Pollinators parasitoids, Scavengers and weed killers.

UNIT – II

Classification of insecticides – based on mode of action, contact, systemic, fumigants, nerve and stomach poison. Biological control. Integrated pest control.

UNIT – III

Basic principles of insecticide formulation and their application in pest control – plant protection appliances used – working and application.

UNIT – IV

Precautions in handling of pesticides. Pesticides and environmental pollution.

UNIT – V

Assessment to pest population, Estimation of pest damage – pest outbreak – pest surveillance.

Reference Books:

B. Vasantharaj David and T. Kumaraswami 1988. Elements of Economic Entomology. Popular book Depot, Chennai.

Nayar, K.K., AnanthaKrishnan, T.N. and B.V. David 1992 General and applied Entomology Tata McGraw, New Delhi.

P.G. Fenemore, Alka Prakash 1997 Allied Entomology, Wiley Eastern Ltd. New York.

Wigglesworth J.B., 1994. Insect physiology, Chapman and Hall, London.

Temphare D.B., 1984. A Text Book of Insect Morphology, physiology and Endocrinology. S. chand and co., New Delhi.

ALLIED PRACTICAL
ECONOMIC ENTOMOLOGY – I & II

I. MAJOR PRACTICAL

Model / chart – Draw and comment

Life cycle of Holometabolous, Hemimetabolous and Ametabolous Insects [Atleast one example in each]

Insect formulations and plant protection appliances.

II. MINOR PRACTICAL

Mounting

Mouth parts – Bed Bug, Mosquito and House fly

Sting apparatus of Honeybee.

III. SPOTTERS

Pests of agricultural Importance – citrus Butterfly, Rhinoceros beetle, Stem borer – Rice, Sugar cane, Chola, Cotton, Fruit borer, Root borer, six spotted beetle, grasshopper, Crickets, Pod Borer [pulses], Rice weevil, Mango nut weevil. Pest of Medical Importance – Mosquito, Housefly, cockroach, Ticks, Mites, Louse, Bed Bug, Plasmodium, Filarial Worm, Loa Loa, Dust mite.

IV. RECORD

Collection and preservation of insects – insect store box

Note: The Students may be asked to submit a minimum of 10 whole mounts of the insects.

THIRUVALLUVAR UNIVERSITY
BACHELOR OF ARTS
B. A. DEFENCE AND STRATEGIC STUDIES
DEGREE COURSE
CBCS PATTERN
(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S. No | Part | Study Components | | lins hrs / Week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|------------------|---------|-----------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER –I | | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/ Other Language | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 5 | 4 | Fundamentals of war and peace | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper-2 | 4 | 3 | Defence Mechanism of India | 25 | 75 | 100 |
| 5 | III | ALLIED -1 | Paper-1 | 7 | 4 | Outlines of Political Theory-I | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | Paper-1 | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 21 | | 150 | 450 | 600 |
| | | | | | | | | | |
| | | | | | | | | | |
| SEMESTER –II | | | | | | | CIA | Uni.Exam | Total |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/ Other Language | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-3 | 5 | 4 | The Art of Warfare in India upto 15 th Century | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-4 | 4 | 3 | World military History-I (4 th cent. BC to Napoleonic Warfare | 25 | 75 | 100 |
| 11 | III | ALLIED -I | Paper-2 | 7 | 6 | Outlines of Political Theory-II | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 24 | | 175 | 525 | 700 |
| | | | | | | | | | |

B.A., Defence and Strategic Studies – Syllabus (CBCS)

| SEMESTER –III | | | | | | | CIA | Uni.Exam | Total |
|---------------|-----|---------------------|---------|-----------|-----------|--|------------|------------|------------|
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil/ Other Language | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-5 | 3 | 3 | The Art of Warfare in India Since 16 th Century | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-6 | 3 | 3 | World military History-II (Since American War of Independence to World War II) | 25 | 75 | 100 |
| 18 | III | ALLIED -I | Paper-3 | 7 | 4 | General Economics-I | 25 | 75 | 100 |
| 19 | IV | Skill Based Subject | Paper-1 | 3 | 3 | Requirements of Indian Army Air Force and Navy | 25 | 75 | 100 |
| 20 | IV | Non-major elective | Paper-1 | 2 | 2 | Fundamentals of Defence and Strategic Studies | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |

| SEMESTER –IV | | | | | | | CIA | Uni.Exam | Total |
|--------------|-----|---------------------|---------|-----------|-----------|---|------------|------------|------------|
| 21 | I | Language | Paper-4 | 6 | 4 | Tamil/ Other Language | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-7 | 3 | 3 | International Relations and Organizations | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper-8 | 3 | 2 | Limited wars | 25 | 75 | 100 |
| 25 | III | ALLIED -I | Paper-4 | 7 | 6 | General Economics-II | 25 | 75 | 100 |
| 26 | IV | Skill Based Subject | Paper-2 | 3 | 3 | Industrial Security | 25 | 75 | 100 |
| 27 | IV | Non-major elective | Paper-2 | 2 | 2 | Fundamentals National Security | 25 | 75 | 100 |
| | | | | 30 | 24 | | 175 | 525 | 700 |

B.A., Defence and Strategic Studies – Syllabus (CBCS)

| SEMESTER –V | | | | | | | CIA | Uni.Exam | Total |
|--------------|-----|----------------------|----------|----|----|---|-----|----------|-------|
| 28 | III | Core Theory | Paper-9 | 6 | 5 | Armed forces and society | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-10 | 6 | 4 | Strategic thought | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper-11 | 6 | 4 | Nuclear Warfare | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper-12 | 6 | 4 | Defence Economics | 25 | 75 | 100 |
| 32 | III | Elective | Paper-1 | 3 | 3 | (To choose any 1 out of 3) A. Warfare in independent india B. Military Geography C. Essentials of Public Administration | 25 | 75 | 100 |
| 33 | IV | Skill based subject | Paper-3 | 3 | 3 | News Writing Procedure and News Story | 25 | 75 | 100 |
| | | | | 30 | 23 | | 150 | 450 | 600 |
| SEMESTER –VI | | | | | | | CIA | Uni.Exam | Total |
| 34 | I | Core Theory | Paper-13 | 7 | 5 | National Security of India | 25 | 75 | 100 |
| 35 | II | Core Theory | Paper-14 | 7 | 5 | Introduction to International Law | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper-15 | 7 | 5 | Arms Control and Disarmament | 25 | 75 | 100 |
| 37 | III | Elective | Paper-2 | 3 | 3 | (To choose any 1 out of 3) A. Specialized Warfare B. Warfare and Technology C. Elementary Study of the Constitution of India | 25 | 75 | 100 |
| 38 | | Elective | Paper-3 | 3 | 3 | A. Defence Management B. Human Rights C. Terrorism | 25 | 75 | 100 |
| 39 | III | Skill based subject | Paper-4 | 3 | 3 | Basics of Defence Journalism | 25 | 75 | 100 |
| 40 | | Extension Activities | | - | 1 | | 100 | 0 | 100 |
| | | | | 30 | 25 | | 250 | 450 | 700 |

B.A., Defence and Strategic Studies – Syllabus (CBCS)

| Part | Subject | Papers | Credit | total credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|-------|-------------|
| Part-I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part-II | English | 4 | 4 | 16 | 100 | 400 |
| Part-III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-7) | 57 | 100 | 1500 |
| Part-IV | Environmental Studies | 1 | 2 | 2 | 100 | 100 |
| | Soft Skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others /NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part-V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

THIRUVALLOVAR UNIVERSITY

VELLORE

B.A DEFENCE AND STRATEGIC STUDIES

SYLLABUS

CBCS PATTERN

(With effect from 2017-2018)

SEMESTER – I

PAPER – 1

FUNDAMENTALS OF WAR AND PEACE

Objective:

The history of mankind is highlighted by incidents of war and peace. It is therefore necessary to have in - depth knowledge of these concepts for better understanding and clarity of the subject.

Unit – 1: Conceptual Formulation

- a) Meaning and definition of Defence and Strategic Studies – Its relevance and significance.
- b) Subject content of Defence and Strategic Studies – Its features and relationship with other disciplines of study.
- c) Definition and meaning of basic concepts – War, Campaign, Battle, Strategy, Tactics, Security, and Defence.

Unit – 2: History of Warfare

- a) Historical evolution of warfare – feature of warfare at various historical stages – its contemporary features.
- b) Causes of warfare.
- c) Principles of warfare

Unit -3: Typology of Warfare

- a) Conventional and unconventional wars – civil wars, nationalist war, guerilla war, insurgency, limited war & total war.
- b) ABC warfare – Atomic, Biological & Chemical warfare.
- c) High – tech warfare, electronic warfare, cyber warfare.

Unit – 4: Peace Conceptual Formulations

- a) Concept of peace – meaning and definition, typology of peace.
- b) Peace movements: Anti-nuclear Movements – CND etc,
- c) Zones of peace and nuclear free zones.

Unit – 5: Mechanics of Peace

- a) Settlement of international disputes [Amicable]; ICJ.
- b) Peace Keeping Operations (UNO)
- c) Peace Building, Peace Making, and Peace Research.

REFERENCES

- 1) Philip, T.R., (ed), Roots of Strategy, 1943.
- 2) Michael Howard, (ed), The Theory and Practice of War, 1965.
- 3) D.G.Chandler, The Atlas of Military Strategy: the art, theory and practice of war (London, 1980)
- 4) Fuller, J.F.C., The Foundation of the Science of War (London, 1925)
- 5) Field Marshal, Montgomery, Viscount., A History of Warfare, (London:Collins,1968).
- 6) Galtung, Johan., The Struggle for Peace, (Aham

PAPER – 2

DEFENCE MECHANISM OF INDIA

OBJECTIVE:

The Defence of a country is structured on certain organizational pattern and mechanism. It is therefore essential to have a basic knowledge of them in the correct of India.

Unit – I: The Indian Defence Forces

- a) Rank Structure of the Three Services.
- b) Important training Institution of the Three Services.
- c) Second line of Defence [introduction of BSF, CG, CISF, RR]

Unit – 2: Higher Defence Organizations of India

- a) Power of the President of India in relation of Defence.
- b) Cabinet Committee on Political Affairs (CCPA)
- c) Role and function of Ministry of Defence.
- d) Composition and function of Defence Committees/NSC.
- e) Chief of Staff Committee and joint Intelligence Committee.

Unit – 3: Army Organization

- a) Organization of army Headquarters {role of COAS and PSOs}.
- b) Static and Field formation of Indian Army.
- c) Arms and Services.
- d) Weapons of Indian Army.

Unit – 4: Air Force Organization

- a) Organization of Air Force Headquarters {role of CAS and PSOs}.
- b) Static and Field formation of Indian Air Force.
- c) Types of Aircrafts.

Unit – 5: Navy Organization

- a) Organization of Naval Headquarters {role of CNS & PSOs}.
- b) Static and Field formation of Indian Navy.
- c) Types of Warships.

REFERENCES

- 1) Venkateswaran, A.L., Defence Organisation in India, New Delhi: Government of India, 1967.
- 2) Government of India, The Army of India and its Evolution, Calcutta, 1924.
- 3) Ministry of Defence, Government of India, Indian Armed Forces Year Book, (Annual).
- 4) Palit, D.K., Essentials of Military Knowledge, (New Delhi:1989)
- 5) Singh, Nagendra., Defence Mechanism of Modern State, (New Delhi:1967

ALLIED – 1

PAPER – 1

OUTLINES OF POLITICAL THEORY I

Objectives

This paper tries to

- a) Give an introduction to the discipline of Political Science;
- b) Sketch various forms of States;
- c) Point out the origin of States;
- d) Point out the importance of Law, Equality and Liberty;
- e) Examine the spheres of State activity

UNIT-I: Introduction

1. Nature, Scope and Importance of Political Science
2. Evolution of Political Science
3. Methodology of Political Science
4. Political Science and Social Sciences
5. Art and Science of Political Science.

UNIT-II: State

1. Elements of the State
2. Sovereignty
3. Nation-States
4. Democratic States
5. Non-Democratic States

UNIT-III: Origin of the State:

1. Divine Right Theory
2. Force Theory
3. Patriarchal Theory
4. Matriarchal Theory
5. Evolutionary Theory
6. Social Contract Theory.

UNIT-IV: Law

1. Nature of law
2. Sources of law
3. Kinds Of law
4. Law and Morality

UNIT-V: Liberty and Equality

1. Meaning of Liberty
2. Safeguard of Liberty
3. Law and Liberty
4. Meaning and types of Equality
5. Equality in Modern States
6. Equality and Liberty
7. Sphere of State Action (Economic, Social and Cultural)

REFERENCE BOOKS

1. Amal Roy and Mohit Bhattacharya: Political *Theory: Ideas and Institutions*, The World Press, Calcutta, 2002.
2. J.C.Johari : *Principles of Modern Political Science*, Sterling, New Delhi, 1999.
3. A.C.Kapoor : *Principles of Political Science*, S.Chand & Co., New Delhi, 2000

SEMESTER – II

PAPER – 3

THE ART OF WARFARE IN INDIA UP TO THE 15th CENTURY

OBJECTIVE: This paper attempts to familiarize the students with evolution of art of warfare in India. It is to establish that the art of warfare changes with changes in political governance, nature of threat, and weapon systems,

UNIT – I: Warfare in Ancient India

- a) Types of war during Vedic period.
- b) Alexander's invasion of India (battle of Hydaspas).
- c) Causes of Alexander's Success.
- d) Causes of Poras defeat.

UNIT – II: Military System of the Mauryan Period

- a) Battle of Kalinga and its significance.
- b) Military organizations of Maurayas
- c) Kautilya's Arthasastra philosophy on war, peace, fort, espionage, diplomacy.

UNIT – III: Military System of the Gupta Period

- a) Introduction of Gupta rulers
- b) The Guptan military organization
- c) Military organization of Harsha vardhana

UNIT – IV: Rajput Military System

- a) Rajput challenge to Arab conquest [battle of Rawar]
- b) Md Ghor's conquest of India [battle of Terrain I & II]
- c) Causes of Rajput failures in the middle ages.

UNIT – V: Military System in South India.

- a) Political powers of south India in the medieval period.
- b) Military organization of the Pallava and pandia's
- c) Military achievements of the Chola emperors Chera emperors.

REFERENCES

- 1) Majumdar, R.C., An Advanced History of India, New York: St.Martin,1967.
- 2) Malleson, G.B., The Decisive Battles of India, London:W.H.Allen,1885) Saxena, K.L.M., Military System of India-1850-1900, Delhi'1976.
- 4) Roy, Koushik., From Hydespas to Kargil : A History of Warfare in India from 326 B.C. to A.D 1999, Delhi: Manohar,2004.
- 5) AnjoliNirmal, The Decisive Battles of Indian History, Jaipur: Pointer Publications,1999.
- 6) Sarkar, Jadunath., Military History of India, Bombay: Orient Longmans,1970.
- 7) Das, S.T., Indian Military: Its History and Development, Allahabad: Kitab Mahal,1979.
- 8) V.R.R. Dikshitar, Wars in Ancient India, 1948.

PAPER – 4

WORLD MILITARY HISTORY – I

(4th Century BC to Napoleonic Warfare)

Subject Description: This paper outlines the wars which were fought from 4th century BC to 19th Century AD.

Goals: To make the students understand the evolution of wars in the world from early period.

Objective: On successful completion of the paper, the candidates will be able to a recite the evolution of warfare from early times.

Unit – I: Greek warfare

- a) Military system of the Greeks
- b) Greco – Persian wars – with special reference to the Battles of Marathon, Thermopyle and Salamis.
- c) Peloponnesian wars

Unit – 2: Roman Warfare

- a) Military System of the Romans
- b) Punic wars (Battle of Cannae and Zama)
- c) Campaigns of Julius Caesar

Unit – 3: Warfare in the Middle Ages.

- a) Crusades – Age of Valour
- b) Mongol Military System
- c) Advent of gun powder and its impact on warfare.

Unit – 4: Warfare During 16th and 17th Centuries

- a) Development of weapons during 16th and 17th centuries
- b) Reforms of Gustavus Adolphus
- c) Siege craft and fortification – Vauban
- d) Rise of Professional Armies and Navies.

Unit – 5: Napoleonic warfare.

- a) French Revolution – causes and outcome.
- b) Rise of Napoleon.
- c) Napoleon's Art of Warfare.
- d) Battles of Trafalgar and Waterloo

REFERENCES

- 1) Howard, Michael., War in European History, Oxford: Oxford University Press,1977.
- 2) Keegan, John., A History of Warfare, New York: Vintage,1993.
- 3) Fuller, J.F.C., A Military History of the Western World, New York: Funk &Wagnalls Company,1955.
- 4) Neilberg, Michael,S., Warfare in World History, London / New York : Routledge, 2001.
- 5) Andre Corviser, (ed.), A Dictionary of Military History, Oxford: Blackwell Publishers,1994.
- 6) Dupey & Dupey, Encyclopeadia of Military History.

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PAPER – 2

OUTLINES OF POLITICAL THEORY II

Objectives

This paper tries to

1. Sketch the features of democratic States
2. Outline the structure and function of the legislative
3. Outline the structure and function of the Executive
4. Outline the structure and function of the Judiciary
5. Describe the linkages in democratic State.

UNIT-I: Democratic State

1. Definitions of Democracy
2. Representative Democracy
3. Direct Democratic Devices
4. Theories of Representation
5. Elections

UNIT-II: Legislature

1. Functions of Legislature
2. Theories of Suffrage
3. Constituencies
4. Unicameral Legislature
5. Bicameral Legislature

UNIT-III: Executive

1. Parliamentary Executive
2. Presidential Executive
3. Collective Executive
4. Dictatorship
5. Military Governance
6. Executive Functions

UNIT- IV: Judiciary

1. Functions of the Judiciary
2. Independence of the Judiciary
3. Rule of Law
4. Administrative Law
5. Judicial Activism
6. Alternative Disputes Mechanism

UNIT-V: Political Participation

1. Political Parties
2. Public Opinion
3. Pressure Groups
4. Mass Media
5. Electronic Media

Reference Books

1. Amal Roy and Mohit Bhattacharya : *Political Theory: Ideas and Institutions*, The World Press, Calcutta, 2002.
2. J.C.Johari :*Modern Constitutions*, S.Chand & Co. New Delhi, 1990

SEMESTER – III

PAPER – 5

THE ART OF WARFARE IN INDIA SINCE 16th CENTURY

OBJECTIVE: With the introduction of gun powder in the west, the art of warfare in India entered into professionalism with mughals, Marathas and Sikhs. This paper aims to offers a broader understanding of these aspects.

UNIT – I: Military Systems of the Mughals

- a) Foundation of the Mughal empire [Battle of Panipat I]
- b) Consolidation of the Empire [Battle of Panipat II]
- c) The Mughal military organization, weapon system, art of war.

UNIT – II: The Maratha Military System

- a) The military organization of Shivaji
- b) Development of guerilla warfare and its characteristics.
- c) The Maratha Navy under Kanohji Angre.

UNIT- III: The Sikh Military System

- a) Rise of Sikhism and its philosophy.
- b) Guru Govind Singh's Khalsa Panth.
- c) The Military Organizations of the Sikhs under Maharaja Ranjit Singh.

UNIT – IV: The Advent of Europeans in India

- a) The early settlers of Europeans.
- b) Conquest of Bengal [Battle of Plassey].
- c) The rise of Presidency Armies.

UNIT – V: British Conquest of India.

- a) The decline of the Marathas [Battle of Panipat III]
- b) The first war of Independence, the Great Mutiny 1857.
- c) The Military reforms under the Crown.

REFERENCES

- 1) Majumdar, R.C., An Advanced History of India, New York: St. Martin, 1967.
- 2) Malleson, G.B., The Decisive Battles of India, London: W.H. Allen, 1885
- 3) Saxena, K.L.M., Military System of India-1850-1900, Delhi'1976
- 4) Roy, Koushik., From Hydespas to Kargil : A History of Warfare in India from 326 B.C. to A.D 1999, Delhi: Manohar, 2004.
- 5) Anjoli Nirmal, The Decisive Battles of Indian History, Jaipur: Pointer Publications, 1999.
- 6) Sarkar, Jadunath., Military History of India, Bombay: Orient Longmans, 1970.
- 7) Das, S.T., Indian Military: Its History and Development, Allahabad: Kitab Mahal, 1979.
- 8) V.R.R. Dikshitar, Wars in Ancient India, 1948.

PAPER – 6

WORLD MILITARY HISTORY – II

(Since American War of Independence to World War II)

Subject Description: This Paper aims at informing the students the causes and conduct of American independence war from 19th century to world war – II

Goals: To make the students learn about the wars those were fought from 19th century to World War – II.

Objective: On completion of the paper, the students will be in a position to analyses the cause for war in modern period.

Unit – 1: American Military Experience

- a) American war of Independence – 1776 – 1782
- b) American Civil war – 1861 – 1865
- c) Spanish American war – 1898 – 1900.

Unit – 2: World War – I

- a) Causes
- b) Trench warfare
- c) Mobile warfare – Battles of Somme and Cambrai.

Unit – 3: Development of warfare during inter war period

- a) Land Warfare
- b) Sea Warfare
- c) Air Warfare.

Unit – 4: World War – II

- a) Causes
- b) Development of armored warfare
- c) Blitzkrieg attack.

Unit – 5: World War – II

- a) Desert warfare
- b) Role of Naval power – Battle of Midway
- c) Role of Air power – Battle of Britain
- d) Consequences

REFERENCES

- 1) Reid, Brain Holden, The Origin of the American Civil War, (London, 1996).
- 2) Parish, Peter., The American Civil War, (London:1975).
- 3) Falls, Cyril, The First World War (London:1960)
- 4) Strachan, Hew (ed)., The Oxford Illustrated History of the First World War (Oxford: 1998)
- 5) Dupey & Dupey., Encyclopedia of Military History.
- 6) Posen, B.R., The Sources of Military Doctrine,(Ithaca: Cornell University Press,1984)
- 7) Fuller, J.F.C., The Decisive Battles of the Western World, (London: 1970)

ALLIED – 2

PAPER – 3

GENERAL ECONOMICS I

Objective:

To provide a frame work of knowledge relating to the concepts and practice of Economics in Indian context and to make the students understand the application of Economic principles in the strategic sector. Also, to provide insight on the most pressing issue “Demand for Defence Expenditure” i.e. the right size of defence budget.

UNIT – I

Economic Analysis - Basic Problems of an Economy - Economic Systems - Capitalism - Socialism - Mixed Economy - Communalism - Role of Government.

UNIT – II

Concept and Management of National Income - Problems of measurement - Trends in National Income under Plans.

UNIT – III

Market Mechanism - Law of Demand and Supply - Elasticity of Demand - Elasticity Measurement - Uses - Limitations.

UNIT - IV

Market Forms - Perfect Competition - Monopoly - Discriminative Monopoly - Monopolistic Competition - Wastes of Monopolistic Competition.

UNIT – V

Defence Economics - Economics of Conflict and Terrorism - Scope and Definition - Micro and Macro Economic impact - Disarmament and Peace.

SKILL BASED SUBJECT

PAPER-1

REQUIREMENTS OF INDIAN ARMY, AIR FORCE AND NAVY

Unit: 1

Recruitments in Indian Army, Navy and Air force

1. Short term service –Army
2. Short term service – Navy
3. Short term service- Air force
4. Para military services
5. Coastal Security Guard

Unit: 2

Recruitment into Police forces:

1. TN Police force – Constable, SI
2. TNPSC – Group I
3. UPSC – IPS
4. TNPSC – other services
5. UPSC – other services

Unit 3:

GENERAL KNOWLEDGE I (Indian History & Other Facts)

1. Indian History
2. Facts about India
3. Indian Constitution
4. Civic Life
5. National Movement

Unit 4:

GERNERAL KNOWLEDGE II (World History)

1. Countries of the World
2. World Organizations
3. Physical Geography
4. World Geography
5. Industrial geography

Unit 5:

GERNERAL KNOWLEDGE III (India)

1. Geography of India
2. Sports & awards.
3. Books and Authors
4. Indian Culture
5. Economics & Commerce

References:

1. Manorama year book
2. Civil Services Chronicle
3. Unique guide for civil service prelims.

NON MAJOR ELECTIVE

PAPER – 1

FUNDAMENTALS OF DEFENCE AND STRATEGIC STUDIES

Objective: To introduce the discipline of Defence and Strategic Studies – its subjects contents – Contemporary Relevance; Importance to contemporary world development and relationship – the goals of the discipline

Unit – I: Introduction and Conceptual Formulations

- a) Introduction to the discipline of Defence and Strategic Studies – Subjects contents – relationship with other disciplines – relevance and significance
- b) Basic Concepts of War, battle, Campaign etc.
- c) Definition of Security, Defence, Strategy, Peace etc

Unit – II: History of Warfare

- a) Historical Evolution of Warfare – its features and significance
- b) Principles of War, Causes of War, Function of War;
- c) Types of War – and Scope

Unit – III: Basic of International Relations

- a) Introduce to IR Nature and Scope of International Relations; and Features of International Political System- Structure of international Political System (Uni, Bi & Multi Polar)
- b) Basic Concept Actors in International Political System – State and Non – State actors; World government (UNO)
- c) Security features in International Political system – Collective security, Balance of power, Hegemony, Regionalism, etc.

Unit – IV: Introduction to Peace

- a) Meaning and Definition of peace; typology and peace;
- b) Approaches to peace – Disarmament, International Law;
- c) Peace movement, peace research, peace-making, peace building, peace keeping.

Unit – V: Mechanics of Peace

- a) Role and function of International organizations – League of Nations, UNO;
- b) Amicable means to settle Inter-state conflicts;
- c) Diplomacy-Scope & Function; type of diplomacy – its features.

REFERENCES

- 1) Field Marshal Montgomery, Viscount., A History of Warfare, London: Collins, 1968.
- 2) Palmer, N.D. and H.C. Perkins, International Relations, Boston: Houghton Mifflin, 1953.
- 3) Margenthau, H.J., Politics among Nations: The Struggle for Power and Peace, Calcutta: Scientific Book Agency' 1972.
- 4) Waltz, K., Man, the State, and War: A Theoretical Analysis, New York: Columbia University Press, 1959.
- 5) Johan, Galtung., The Struggle for Peace, Ahmedabad : Gujarat VidhyaPeeth, 1985.
- 6) Chopra, Jarat (ed), The Politics of Peace - Maintenance, New York: 1998.

SEMESTER – IV

PAPER – 7

INTERNATIONAL RELATIONS AND ORGANIZATIONS

OBJECTIVE: In the contemporary world the survival of the mankind is conditioned by the facts of war and peace. The conditions of war and peace are influenced by various actors, viz., State, non-state and international organizations. This paper introduces the students to all these factors.

Unit-1: Introduction–Definition – Meaning – Scope of International Relations

- a. State, Nation, Nation-state, Concepts, Features and Scope.
- b. National Power – Components of National Power – its scope.
- c. Approaches' to international relations- Mainstream theories-Idealist and realist.

Unit-II Power Systems in International Relations

- a. International Power Structure – Definition, Meaning, and Scope- Uni polar, Bi Polar & Multi Polar.
- b. Balance of Power – Meaning and Definition – Characteristics of Balance of Power; techniques of Balance of Power.
- c. Collective Security.

Unit –III: Diplomacy and Foreign Policy

- a. Diplomacy- Meaning, Definition, Objectives and Scope & Types of Diplomacy
- b. Foreign Policy- Meaning, Definition, Determinants of Foreign Policy
- c. National Interest- Meaning and Definitions.

Unit- IV: International Organization and Scope

- a. International Organization – Origin, Growth & Functions
- b. The League of Nations – Origin, Organization, functions – failure of the League of Nations.
- c. The U N O – Origin, Aim, Structure, Scope and Functions.

Unit - V: Regional Organization

- a. Origin, Development and functions of Regional Organizations- Its relevance and utility.
- b. S A A R C – Origin, Objectives, Development and Functions.
- c. ASEAN- Origin, Objectives, Developments and Functions.
- d. Basic understanding of the E U.

REFERENCES

- 1) Palmer, N.D. and H.C.Perkins, International Relations, Boston: Houghton Mifflin,1953.
- 2) Jackson, R. and G.Sorensen, Introduction to International Relations: Theory and Approaches, Oxford: Oxford University Press, 2003.
- 3) Frankel, J., International Relations in a Changong World, London: Oxford University Press, 1977.
- 4) Nicholson,M., International Relations : A Concise Introduction, New York : Palgrave,2002.
- 5) Chatterjee, Aneek., International Relations Today : Concept and Applications, New Delhi: Pearson,2010.
- 6) Johari, J.C., International Relations and Politics, New Delhi: Sterling Publishers,1985

PAPER – 8

LIMITED WARS

Subject description:

This paper deals with the evolution of limited wars after the end of World War – II

Goals: To make the students learn about some of the important wars that was fought after 1945.

Objective: After going through this paper students will have an understanding of wars that were fought after the end of World War – II

Unit – 1: Korean War

- a) Concept, meaning and scope of limited wars
- b) Causes of Korean war
- c) Main events
- d) Role of UNO

Unit – 2: Vietnam War

- a) Causes
- b) Main events
- c) Lessons learnt

Unit – 3: Arab Israeli Wars, 1967 & 1993

- a) Causes
- b) Main events
- c) Role of Air power
- d) Lesson learnt

Unit – 4: Iran – Iraq War

- a) Causes
- b) Highlights of the war
- c) Result and lesson learnt

Unit – 5: Gulf of War I & II

- a) Causes
- b) Highlights of the war
- c) Role of the UN

REFERENCES

- 1) Hastings, Max, The Korean War, (London: 1987)
- 2) Herring, George, America's Longest War (New York, 1996)
- 3) Fraser, T.G., The Arab - Israeli Conflict (London: 1995)
- 4) Agwani, M.S., The West Asian Crisis, New Delhi: 1995.
- 5) Colvocoressi, P., World Politics: 1954 - 2000, New Delhi : Pearson Education,2001.
- 6) Schoot, Ian., World Famous Battles , London : Magpie Books Ltd., 1994

ALLIED – 2
PAPER – 4

GENERAL ECONOMICS II

UNIT-I

Money - Functions - Changes in supply of Money, Inflation - Deflation - Types - Characteristics - Causes - Effects - Remedies - Deflationary Gap.

UNIT-II

Keynesian Theory of Employment - Savings and Investment Analysis.

UNIT-III

Macro-Economic Goals and Tools - Objectives - Central and Commercial Banking in India - Fiscal Policy - Indian Tax System.

UNIT-IV

Growth and Development Strategies - Planning - Agriculture and Industry under Plans with Special reference to the tenth plan.

UNIT-V

Budget - Salient Features - Central and State - Deficit Financing - Priorities in Budgeting - Expenditure in Defence - Recent Trends in Military Finance - Role of Social and Economic infrastructure for Defence Purposes.

Reference Books

General Economics I and II
AUTHOR

TITLE OF THE BOOKS &
PUBLISHERS

- | | | | |
|----|--|---|--|
| 1. | Chrystal, A, Lipsey, R.G. | : | Introduction to Positive Economics, Oxford University Press |
| 2. | Garfinkel, M.R. (University of California) | : | Economics of Conflict, An Overview (a paper presentation) |
| 3. | Hartley & Sandler | : | Hand Book of Defence Economics, North Holland |

SKILL BASED SUBJECT

PAPER-2

INDUSTRIAL SECURITY

Unit 1

Concept – Meaning – definition

Unit 2

Industrial safety – vision and mission of the Industries – Ethical and legal standards.

Unit 3

Recruitment and Selection of Security forces in Industrial Sectors.

Unit 4

Training and Development of Industrial Security forces

Unit 5

Recent developments in Industrial Security and scope for employment.

NON MAJOR ELECTIVE

PAPER – 2

FUNDAMENTAL OF NATIONAL SECURITY

Objective

To develop basic subject knowledge on the vital concept of National Security – and the approaches to achieve National Security (Special reference to India)

Unit – I: Introduction

- a) Definition, Scope and features of the concept of national Security
- b) Concept of National Power – elements of national power (tangible and intangible)
- c) Fundamental factors, Values, goals and policies that determine National Security

Unit – II: Foreign Policy and Defence Policy

- a) Definition, Meaning, Scope of foreign policy and Defence policy.,
- b) Determinants of Foreign policy and defence policy
- c) Instruments of foreign Policy and defence policy – Diplomacy and Defence

Unit – III: Approaches to National Security

- a) Coercive and non-Coercive approach – meaning and scope
- b) Coercive means – threats, threat perception and Defence apparatus – Armed Forces – its organization and functions (India)
- c) Non – Coercive means – peace mechanics – peace making; peace building

Unit – IV: Strategic Environment – India:

- a) Feature of strategic environment – its scope in policy making.
- b) India's Strategic environment – Immediate Neighbours, Adjacent Regions, Indian ocean and Global structure.
- c) India's Military preparedness – Defence Budget, Force structure and organization.

Unit – V: India's Strategic Relationship (Salient Features):

- a) India – Pakistan Politico – Strategic Relations.
- b) India – China Politico – Strategic Relations.
- c) India and World powers.

REFERENCES

- 1) Barry, Buzon., People, State and Fear : The National Security Problems in International Relations, Sussex ; Wheatsheaf Books, 1983.
- 2) Bajpai, U.S.,(ed) India's Security : The Politico-Strategic Environment, New Delhi :Lancers Books, 1983.
- 3) Dixit, J.N., Accross Borders: Fifty Years of India's Forgeign Policy, New Delhi: Picus Books, 1998.
- 4) Satish Kumar, (ed)., Yearbook on India's Foreign Policy, New Delhi : Deep & Deep,1993.
- 5) Jayaramu, P.S., India's National Security and Foreign Policy, New Delhi: ABC Publishers, 1978.
- 6) Kaul, T.N., India and the New World Order, Vol. 1, New Delhi: Gyan, 2000.
- 7) Kux, Dennis, Estranged Democracies: India and the United States 1941 - 1991, New Delhi: Sage Publications, 1994.

SEMESTER – V

PAPER – 9

ARMED FORCES AND SOCIETY

Unit – 1: Study of Society

- a) Definition forms and types
- b) Differences between Society, Community, Association and state.
- c) Special Features of military organization.

Unit – 2: Social Groups

- a) Definition
- b) Types
- c) Structure and importance

Unit – 3: Leaderships

- a) Meanings and Definition
- b) Types and levels
- c) Theories of leadership

Unit -4: Evolution of State

- a) Nation – Nation Building process
- b) Merits of Nation Building process
- c) Effects of Nation Building process

Unit – 5: Civil – Military Relations

- a) Relations in political set – up
- b) Military influence on national policy
- c) Armed forces aid to civil power.

REFERENCES

- 1) SankarRao, C.N., Sociology , New Delhi : S.Chand& Company, 1997.
- 2) Goode, W.J., Principles of Sociology, New Delhi : T M H Publishing Co. Ltd., 1977.
- 3) Koithara, Verghese., Society, State & Security : Indian Experience, New Delhi : Sage,1996.
- 4) Johnson, John., The Role of Military in Underdeveloped Countries.
- 5) Morris Janowitz , Sociology and Military Establishment.
- 6) Jewaki, Androze S., Military Organisation and Society.
- 7) Grille, Race, Class and Military.

PAPER – 10

STRATEGIC THOUGHT

Subject description: This paper provides basic knowledge about the concepts of selected strategic thinkers.

Goals: To understand the thought of thinkers this has relevance even during the present times.

Objective: To make the students realize the value of strategic thought in policy formation.

Unit I: Introduction

- a) Concept of strategic thought
- b) Concept of Non – Violence by Gandhi
- c) Nehru and Non – Alignment

Unit – 2: Linkages between War and Politics

- a) Concepts of Machiavelli
- b) Concepts of Jomini
- c) Concepts of Clausewitz

Unit – 3: Strategic Thoughts of

- a) Vauban
- b) Schlieffen
- c) Von Moltke

Unit – IV Concepts on land, Sea, and Air Power

- a) Mao's theory on Guerilla warfare
- b) Mahan's theory of sea power
- c) Douhet's theory of Air power

Unit – 5: Nuclear Strategy

- a) The impact of Nuclear weapons on strategy
- b) Strategy of Deterrence
- c) Nuclear Strategies since 1945

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- 6) Tripathi, K.S., Evolution of Nuclear Strategy, (Delhi, 1980).

PAPER – 11

NUCLEAR WARFARE

Unit – I: Introduction

- a) A: The evolution of nuclear era since 1945
- b) B: Basics of nuclear technology, & nuclear energy
- c) C: effects of nuclear explosion.

Unit – II: Delivery systems

- a) A: missiles, types & effects.
- b) B: Triad
- c) C: Tactical nuclear weapons.

Unit – III: Nuclear Warfare Theories

- a) A: Preventive war, pre-emptive war strategy
- b) B: massive Retaliation & Flexible Response.
- c) C: Counter Value, Counter Force, MAD & MAS.

Unit – IV: Nuclear Weapons treaties

- a) A: PTBT, NPT, ABM,
- b) B: SALT - I , SALT – II, START.
- c) C: CTBT.

Unit – V: India's Nuclear Strategy

- a) A: Evolution of Nuclear Weapons Programme.
- b) B: Peaceful Nuclear Explosion (PNE).
- c) C: Minimum deterrence strategy.

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- 2) Glasstone, S., and Dolan, P.J., The Effects of Nuclear Weapons (Washington ,1977).
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PAPER – 12
DEFENCE ECONOMICS

Unit - I: Introduction

- a) Definition of Economics
- b) Types of Economic System – Their Merits and Demerits
- c) Defence Vs Development

Unit – II: Defence Budget

- a) Concept of Finance, Revenue and Expenditure
- b) Budgetary Process, National Income, Gross National Product, Gross Domestic Product.
- c) Analysis of India's Defence Budget during the past five years

Unit – III: Defence Planning

- a) Concept of Defence and Important of Defence Planning
- b) System Analysis – Its Utility in Defence Planning
- c) Cost Effectiveness and choice of Weapons System

Unit – IV: Defence Production

- a) Classification of Defence Requirements
- b) Role of Ordnance factories, Public and private Sector undertakings in Defence Production
- c) Role of Defence Research and Development Organization in Defence Production

Unit – V : Effects of War on Economy

- a) Inflation Balance of Trade and Balance of Payment
- b) Mobilization of Resources for War efforts
- c) Growth of Science and technology.

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- 5) Subramaniam,K., Perspectives in Defence Planning, New Delhi:ABC Publishers.
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ELECTIVE – I

PAPER – 1

A. WARFARE IN INDEPENDENT INDIA

Unit – I: Kashmir Operation 1947-48

- a) Causes
- b) Outline of events
- c) Result and lessons learnt

Unit –II: Chinese Aggression 1962

- a) Causes
- b) Outline of events
- c) Result and Lesson learnt

Unit – III: Indo – Pak Conflict 1965

- a) Causes
- b) Outline of events
- c) Result and Lesson learnt

Unit – IV: Liberation War 1971

- a) Causes
- b) Outline of events
- c) Result and Lesson learnt

Unit – V: Kargil Operations 1999

- a) Causes
- b) Main Events
- c) Lessons Learnt

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- 3) Maxwell, Neville., India's China War, New Delhi: Orient Longman, 1972.
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- 12)Lt. Gen. J.F.R.Jacob, Surrender of Dacca, New Delhi: Manohar, 1997.
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- 16)The Kargil Committee Review Report, From Surprise to Reckoning, New Delhi: Sage, 2000.
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ELECTIVE – I

PAPER – 1

B. MILITARY GEOGRAPHY

Unit – I: Introduction

- a) Meaning and nature of Military Geography.
- b) Scope of Military Geography.
- c) Elements of Military Geography- Earth size, shape, location, climate, topography & population.

Unit - II: Evolution of Military Geography.

- a) History & Development.
- b) Founders of Military Geography - F. Ratzel, A.T. Mahan,
- c) Sir. Halfred Mackinder, Karl Haushofer, N.J. Spykman.

Unit - III: Inter-State relations & Geographical factors.

- a) Frontiers and Boundaries- meaning & differences; types; boundary making & function.
- b) Communication routes- land, sea and aerial- strategic scope.
- c) Population and Power.

Unit - IV: Geography and Foreign Policy of India.

- a) India's Geo-strategic significance-location, size, shape, climate, topography, resources etc.
- b) India's borders- nature and characteristics of land border; maritime boundary.
- c) Indian Ocean territory and strategic significance.

Unit - V: Applied Military Geography.

- a) Global Positioning System (GPS).
- b) Global Information System (GIS).
- c) Remote Sensing.

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ELECTIVE – I

PAPER – 1

C. ESSENTIALS OF PUBLIC ADMINISTRATION

This paper introduces the discipline of Public Administration; its methods & scope. It introduces the structure and functions of the Union and State Administration; the organization principles and the Public Management through administrative services.

Unit – I: Introduction

- (a) Meaning, nature, scope and importance of Public Administration.
- (b) Evolution of Public Administration.
- (c) Public Administration and other Social Sciences.
- (d) Arts and Science of Public Administration.

Unit - II: Union Administration.

- (a) President.
- (b) Prime Minister's office.
- (c) Central Secretariat.
- (d) Organisation of Ministers.

Unit – III: State Administration

- (a) Governor.
- (b) Chief Minister's office.
- (c) State Secretariat.
- (d) Organisation of Ministers.

Unit - IV: Organisation - Principles.

- (a) Hierarchy & Span of Control.
- (b) Unity of Command,
- (c) Centralisation & De-Centralisation.
- (d) Coordination.

Unit – V: Public Management.

- (a) Principles of Management- motivation; communication; decision-making; leadership.,
- (b) All India Services - IAS., IPS., IFS., & other central services.
- (c) State Administration- Collectors., Superintendent of Police., Tahsildars & BDO,s.
- (d) Centre - State relations.

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- 2) Baghwan, Vishnoo and Vidya Bhushan, Indian Administration, New Delhi: S.Chand & Co, 2005.
- 3) Arora and RajniGoyal, Indian Public Administration, New Delhi: Wishwa Prakashan, 2006.
- 4) Avasthi&S.R.Maheshwari, Principles of Public Administration, New Delhi: LakshmiNarain Agarwal,1990.
- 5) Tyagi, A.R., Principles of Public Administration, New Delhi: Atma Ram,1990

SKILL BASED SUBJECT

PAPER – 3

NEWS WRITING PROCEDURE AND NEWS STORY

Objective: This paper aims at teaching the students the nuances in presenting a News story. The usage of words in writing a story to make an impact on the reader is taught to the students in this paper.

Unit – I: Introduction to News Writing Procedure

- a) Where to begin, the Date and Place
- b) Paragraphing and Readability
- c) Aids to clarity and Journalistic Style

Unit – II: Defining the News Story

- a) Formats of News Story the inverted Pyramid News vs Sequential Style
- b) The Usage of the third person, Grammar Quotation and Ending the story
- c) Paragraph - writing clarity, geniuses

Unit – III: The Five ‘W’s

- a) Head Lines, caption writing
- b) Editorials Culm whmn writing, feature stores

Unit – IV: Types of Media and News story

- a) Media Types: - Print Audio, Video Internet Web.
- b) Political, Sports, Financial, Entertainment etc.
- c) Civic Affairs

Unit – V: Specialized Reporting

- a) Science Reporting
- b) Industrial Reporting
- c) Entertainment Reporting

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- 1) Menon, P.K, Electronic Media and Broadcasting, Jaipur :Aavishkar Publishing, 2006.
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SEMESTER – VI

PAPER – 13

NATIONAL SECURITY OF INDIA

Unit – I: Concept of Security

- a) Meaning, definition and Objectives
- b) Elements of National Security
- c) Kinds of National Security

Unit - II: Threats to National Security

- a) Meaning and Definition
- b) Threat Perception
- c) Types of threats and threats to India

Unit - III: India's Strategic Relations with its Neighbors

- a) Pakistan
- b) China
- c) Other SAARC members

Unit – IV: India's Strategic Relations with

- a) USA
- b) Russia

Unit – VI: India's Interest in Asia

- a) India and West Asia
- b) India and Asian
- c) India and Indian Ocean.

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PAPER – 14

INTRODUCTION TO INTERNATIONAL LAW

Unit – I: Introduction

- a) Definition of International Law – Its history and development
- b) Nature, source and codification
- c) Relationship between International Law and Municipal Law

Unit – II: Laws of war – I

- a) Forcible means of settlement of international disputes
- b) War – Its legal character and effects
- c) Termination of war and postliminium

Unit – III: Laws of war – II

- a) Laws of Land warfare
- b) Laws of Maritime warfare
- c) Laws of Aerial Warfare

Unit – IV: Laws of Neutrality

- a) Basic understanding of laws of neutrality
- b) Right of Angry
- c) Contraband and Doctrine of Continuous Voyage

Unit – V: Legal Mechanisms

- a) Blockade – Concept establishments Kinds and Penalties for breach
- b) Prize courts Its role and importance
- c) Role and functions of International court of Justice.

REFERENCES

- 1) Tandon, M.P, and Rajesh Tandon, An Introduction of International Law, Allahabad: Allahabad Law Agency, 1987.
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- 5) Oppenheim, International Law.

PAPER – 15

ARMS CONTROL AND DISARMAMENT

Objectives: Arms Control Efforts from the formation of nation, State system is attempted in this paper. Efforts towards disarmament gained momentum after the Second World War which is portrayed in this paper.

Unit - I: Introduction

- a. Definition of Arms Control, Arms Limitations, Arms Reduction and Arms Trade.
- b. Differences between Arms Control, Arms Limitations, Arms Reduction and Arms Trade.
- c. Nature and Scope of Arms Control and Disarmament.

Unit – II: From Treaty of Westphalia to World War – II

- a. Efforts towards Disarmament from Treaty of Westphalia 1648 to the Outbreak of World War I
- b. Efforts towards Disarmament from World War I to the outbreak of World War II.
- c. Efforts towards the formation of the UNO.

Unit – III: UN and Disarmament

- a. UN's Perception on Disarmament and Arms Control.
- b. Major efforts till the Disarmament Decade.
- c. Causes and failures.

Unit – IV: Disarmament Efforts – Success Story

- a. PTBT, NNPT
- b. SALT I and II
- c. INF, START and Outer space.

Unit –V: Disarmament Efforts by Other Bodies

- a. NAM
- b. Nuclear Free Zones
- c. Efforts of India

REFERENCES

- 1) Subramaniam, K., Nuclear Proliferation and International Security, New Delhi: Lancer, 1986.
- 2) Pande, S., Future of NPT, New Delhi: Lancer, 1995.
- 3) Pande, S., CTBT: India and the Nuclear Test Ban Treaty, New Delhi: Cosmo, 1994,
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ELECTIVE – II
PAPER – 2

A. SPECIALIZED WARFARE

Subject Description: This paper describes the various types of warfare that are taught in the world.

Goals: To understand the different types of war waged by nations at large.

Objective: After completing the paper the students will understand the types of war prevalent in the world

Unit – I: Psychological Warfare

- a) Definition and nature of psychological Warfare
- b) Types of Propaganda
- c) Brain washing and its effect
- d) Rumor: Nature and techniques

Unit – II: Biological and Chemical Warfare

- a) Concept and objectives
- b) Characteristics
- c) Types of agents and Methods of Use
- d) Recent Trends

Unit – III: Guerilla Warfare

- a) Concept and objectives
- b) Characteristics Guerilla Warfare
- c) Elementary knowledge of Insurgency and Counter Insurgency

Unit – IV: Nuclear warfare

- a) Concept and origin of Nuclear Warfare
- b) Effects of Nuclear flash, Thermal Radiation, Nuclear Radiation
- c) Elementary knowledge of Missiles

Unit – V: Terrorism

- a) Definition
- b) Causes
- c) Types of Techniques

REFERENCES

- 1) Philip M. Taylor, Munitions of the Mind: War Propaganda from the Ancient World to the Nuclear Age, (Wellingborough, 1990)
- 2) Qualter, T.H., Propaganda and Psychological Warfare, (New York, 1962)
- 3) SIPRI, The Problem of Chemical and Biological Warfare (4 Vols, New York, 1971)
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- 9) Herbert Feis, The Atomic Bomb and the End of World War II (Princeton, 1966)

ELECTIVE – II

PAPER – 2

B. WARFARE AND TECHNOLOGY

Unit – I: Introduction

- (a) Historical evolution of warfare.
- (b) Evolution of Science & Technology.
- (c) Synergy of warfare and science & technology.

Unit – II: Science & technology and its Scope.

- (a) S&T - applications- Military, Non-military, and Dual usage.
- (b) Industrial revolution & new technologies- IC- Engine, Radio, Electricity, & Radar.
- (c) Emerging Technologies- Nuclear science, Oceanography, Space technology & electronics.

Unit – III: Weapons Technology & Warfare

- (a) Weapons of Land Warfare- types of arms and armaments & artillery.
- (b) Naval Weapons- types of ships, aircraft carrier, submarines, torpedo.
- (c) Aerial War Weapons- types of aircrafts, missiles, satellites, radars.

Unit – IV: Emerging Technologies & Warfare

- (a) Information Technology and communication warfare.
- (b) Robotics and Cyber war.
- (c) R M A - revolution in military affairs.

Unit – V: Weapons Technology and India.

- (a) Pioneering institutions and its contributions.
- (b) S & T policy of India.
- (c) D R D O - its role in weapons development.

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- 1) Ajeylele, Strategic Technology for the Military, New Delhi:Sage,2009.
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ELECTIVE – II

PAPER – 2

C. ELEMENTARY STUDY OF THE CONSTITUTION OF INDIA

This paper introduces the Indian Constitution and its salient features - fundamental rights and directive principles of state policy. The role and functioning of the executive, legislature and the judiciary.

Unit – I: Introduction

- (a) Meaning and scope of Constitution.
- (b) Types of constitution-written& unwritten; flexible ®id; unitary &fedral.
- (c) Salient features of indianconstitution ,
- (d) Fundamental Rights & Directive principles of state policy.

Unit – II: The Union Executive

- (a) The President of India-Qualifications,election procedure.
- (b) The role of the President.
- (c) The Vice-President of India-Qualification& election procedure.
- (d) The role of the Prime Minister.

Unit- III: The Parliament of India

- (a) LokSabha- its composition and function.
- (b) RajyaSabha- its composition and function.
- (c) Basic legislative procedures.
- (d) Budget-procedure & scope.

Unit – IV: The State Administration

- (a) The Governor- role and powers of Governor.
- (b) The role and function of the Chief Minister.
- (c) The State legislature - its role & functions.

Unit – V: The Constitutional Bodies in India

- (a) The role and function of the Supreme Court of India.
- (b) The role and function of the Election Commission.
- (c) The role and function of the Comptroller and Auditor General (CAG).
- (d) The role and function of Union Public Service Commission (UPSC).

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- 1) Basu, D.D., Introduction to the Constitution of India, 20 th edn.Nagpur:LexisNexis,2008.
- 2) Basu, D.D., Shorter Constitution of India, 14 thedn., Nagpur: LexisNexis, 2008.
- 3) Arvind P Datar, Constitution of India, 3 Vols, Nagpur: LexisNexis, 2007.

ELECTIVE – III
PAPER – 3

A. DEFENCE MANAGEMENT

Unit – I

Definition, Scope and Principles of Management and Decision Making Process and HDO of India.

Unit – II

Defence organization – nature and structure [Line and staff, Pyramid hierarchy in Army Navy and Air Force].

Unit – III

Personnel Management – Staffing [Recruitment and Training]

Unit – IV

System Analysis – Qualitative Management and Evaluation of Defence Forces

Unit – V

Cost Effectiveness – Force Level, Production and procurements of weapons systems and R and D

REFERENCES

- 1) Knoontz and O'Donnel, Principles of Management, (Printice,1976)
- 2) Osgood, Robert, Principles of Management, New Delhi: Printice-Hall,1978.
- 3) Davar,R.S., Management, Delhi:Cosmos,1975.
- 4) Keatz, James Euerett., Arms Production in the Developing Countries, London:Lexington Books,1984.

ELECTIVE – III
PAPER – 3
B. HUMAN RIGHTS

Unit – I: Definition and evolution of the concept.

- (a) Meaning, Nature and Development.
- (b) Three Generation Rights.
- (c) Contributions: Hobbes, Locke, Rousseau and Rawls.

Unit – II: Approaches & Perspectives.

- (a) Universalistic and Relativist approaches.
- (b) Feminist & Marxist approach.
- (c) Third World Perspective- Gandhian view.

Unit – III: United Nations & Human Rights.

- (a) U N Charter and the Universal Declaration of Human Rights.
- (b) International Conventions and Covenants.
- (c) Other Protocols.

Unit – IV: Indian Perspective

- (a) Human Rights in Indian tradition- Civil, Political, Economic, Cultural Rights & Women's Rights.
- (b) Constitutional & Legal framework in India- Human Rights Commission & Special Commission for weaker section.
- (c) Human Rights Education: UNESCO & Montreal Protocol.

Unit – V: Issues and Challenges

- (a) Human Rights and challenges - ethnic conflict, social & political violence, global terrorism, environmental sources.
- (b) Rights of Refugees.
- (c) Internally Displaced people.

REFERENCES

- 1) Bajwa, G.S., Human Rights in India : Implementations and Violations, New Delhi: Sterling, 1995.
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ELECTIVE – III

PAPER – 3

C. TERRORISM

This paper introduces the concept of Terrorism and its manifestations in historical perspective. Motivated organized violence targeting the population and the government threatening the existing social and political order has become very prevalent in today's world. Basic understanding of terrorism is essential to appreciate the events in right perspective.

Unit – I: Introduction

- (a) Definition and meaning of Terrorism.
- (b) History of Terrorism.
- (c) Nature and Tactics of Terrorism.

Unit – II: Terrorism in perspective

- (a) Causes of Terrorism.
- (b) Types of Terrorism.
- (c) Levels of Terrorism.

Unit – III: Terrorism and India

- (a) Kashmir- Cross-border terrorism - Lashkar-e-Toiba; Talibans,
- (b) Extremism in North-East India.
- (c) Naxalites in India.
- (d) Parliament & Mumbai Taj hotel attack.

Unit - IV: International Terrorism

- (a) Palestinian Issue.
- (b) Irish Issue.
- (c) Sri Lanka- LTTE Issue.
- (d) September 11 attack in the USA.-Al Qaeda.

Unit – V: Terrorism in International Relations

- (a) War against Terrorism- responses of Major Powers.
- (b) Terrorism and United Nations Organisation.
- (c) Terrorism and other International Organisations.

REFERENCES

- 1) Yonah Alexander, David Carton and Paul Wilkinson, Terrorism : Theory and Practice, Colorado: West View Press,1979.
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- 5) Virender Grover, (ed).,Encyclopeadia of International Terrorism: Terrorism in World Countries, Vol.2, New Delhi: Deep & Deep Publications,2002.

SEMESTER – VI
SKILL BASED SUBJECT
PAPER – 4
BASICS OF DEFENCE JOURNALISM

Objective: To prepare the students in handling a specialized field of journalism Viz Defence journalism

UNIT-II: Introduction

- a) Journalism meaning and importance
- c) Defence Writing – Need for specialist
- d) Defence Journalism – As a Profession

UNIT-II : Defence News

- a) Meaning and Defining Journalism and Defence News Journalism
- b) Kinds of Sources of Defence News
- c) Defence Writing Procedure

UNIT-III: Defence Reporting

- a) Format languages and grammar
- b) Forms – Eye witness, computer assigned features
- c) Concept of Graphics and Animation (Role of Modern Technology)

UNIT-IV: Defence Terminology

- a) Defence terms & Abbreviations Weapons, Weapons system
- b) Role and importance of News organization- PTI, PCI, etc.

UNIT-V: Problem in Defence writing

- a) Media Ethics
- b) Media Laws
- c) Problem in Defence Writing – Political Pressure Official Secrecy – etc.,
- d) Introducing existing defence Journals Sainik, Samachar, Trishul, Strategic Digest, Strategic Analysis etc.

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- 1) Waren ,KAgrie., (ed)., The Press and the Public Interest, Washington, D.C.: Public Affairs Press, 1968.
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THIRUVALLUVAR UNIVERSITY

BACHELOR OF ARTS

B.A (ECONOMICS)

DEGREE COURSE

UNDER CBCS

(With effect from 2017 – 2018)

The Course of Study and the Scheme of Examinations:

| S.No | Part | Study Components | | Ins. Hrs/ Week | Credit | Title of the Paper | Max. Marks | | |
|-------------|------|------------------|-----------|----------------------|--------|---|------------|-------------|-------|
| | | Course Title | | | | | CIA | Un. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper - 1 | 6 | 4 | Tamil/Other Language | 25 | 75 | 100 |
| 2 | II | English | Paper - 1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper - 1 | 4 | 3 | Micro Economics – I | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper - 2 | 5 | 3 | Statistics for Economics | 25 | 75 | 100 |
| 5 | III | Allied - 1 | Paper -1 | 7 | 4 | (to Choose 1 out 4) 1. History of India 2. Agricultural Economics 3. Basics of Computer Applications 4. Financial Accounting | 25 | 75 | 100 |
| 6 | IV | Environ studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper - 2 | 6 | 4 | Tamil/Other Language | 25 | 75 | 100 |
| 8 | II | English | Paper - 2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper - 3 | 4 | 3 | Micro Economics – II | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper - 4 | 5 | 3 | Mathematics for Economics | 25 | 75 | 100 |
| 11 | III | Allied - 1 | Paper - 2 | 7 | 6 | to Choose 1 out 4) 1. History of India I 2. Agricultural Marketing 3. Basics of Computer Applications II 4. Financial Accounting II | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |

| S.No | Part | Study Components | | Ins. Hrs/ Week | Credit | Title of the Paper | Max. Marks | | |
|--------------|------|---------------------|-----------|----------------------|--------|---|------------|-------------|-------|
| | | Course Title | | | | | CIA | Un. Exam | Total |
| SEMESTER III | | | | | | | | | |
| 4 | I | Language | Paper – 3 | 6 | 4 | Tamil/Other Language | 25 | 75 | 100 |
| 15 | II | English | Paper – 3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper - 5 | 3 | 3 | Indian Economy – I | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper - 6 | 3 | 3 | Monetary Economics - I | 25 | 75 | 100 |
| 18 | III | Allied - 2 | Paper -3 | 7 | 4 | (to Choose 1 out 4) 1. Economics of Entrepreneurship 2. Economic development of Tamil nadu - I 3. Women and the Economy 4. Cost and Management accounting – I | 25 | 75 | 100 |
| 19 | IV | Skill based Subject | Paper – 1 | 3 | 3 | Marketing communications & Advertisement – I | 25 | 75 | 100 |
| 20 | | Non Major Elective | Paper – 1 | 2 | 2 | Fundamentals of Economics – I | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| SEMESTER IV | | | | | | | | | |
| 21 | I | Language | Paper – 4 | 6 | 4 | Tamil/Other Language | 25 | 75 | 100 |
| 22 | II | English | Paper – 4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper - 7 | 3 | 3 | Indian Economy – II | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper – 8 | 3 | 3 | Monetary Economics - II | 25 | 75 | 100 |
| 25 | III | Allied - 2 | Paper -4 | 7 | 6 | (to Choose 1 out 4) 1. Basic Econometrics 2. Economic development of Tamilnadu II 3. Development economics 4. Cost and Accounting II | 25 | 75 | 100 |
| 26 | IV | Skill based Subject | Paper – 2 | 3 | 3 | Marketing communications & Advertisement – II | 25 | 75 | 100 |
| 27 | IV | Non Major Elective | Paper – 2 | 2 | 2 | Fundamentals of Economics – II | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | |

| | | | | | | | | | 700 |
|-------------|------|----------------------|----------------|--------|--------------------|---|----------|-------|-----|
| S. No | Part | Study Components | Ins. Hrs/ Week | Credit | Title of the Paper | Max. Marks | | | |
| | | Course Title | | | | CIA | Un. Exam | Total | |
| SEMESTER V | | | | | | | | | |
| 28 | III | Core Theory | Paper - 9 | 6 | 4 | Macro Economics - I | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper - 10 | 6 | 4 | Fiscal Economics - I | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper -11 | 6 | 5 | Managerial Economics | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper -12 | 6 | 5 | Industrial Economics | 25 | 75 | 100 |
| 32 | III | Elective | Paper - 1 | 3 | 3 | (to Choose 1 out 4) 1. Environmental Economics – I 2. International Trade – I 3. Industrial Organisation - I 4. Economics of Capital Market and Digital Economy - I | 25 | 75 | 100 |
| 33 | IV | Skillbased Subject | Paper - 3 | 3 | 3 | Human Resource Management – I | 25 | 75 | 100 |
| | | | | 30 | 23 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | | | |
| 34 | III | Core Theory | Paper – 23 | 7 | 5 | Macro Economics – II | 25 | 75 | 100 |
| 35 | III | Core Theory | Paper – 24 | 6 | 4 | Fiscal Economics – II | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper -25 | 6 | 5 | History of Economic Thought | 25 | 75 | 100 |
| 37 | III | Elective | Paper - 2 | 3 | 3 | (to Choose 1 out 4) 1. Environmental Economics – II 2. International Trade – II 3. Industrial Organisation – II 4. Economics of Capital Market & Digital Economy – II | 25 | 75 | 100 |
| 38 | III | Elective | Paper – 3 | 3 | 3 | (to Choose 1 out 4) 1. Labour Economics 2. Insurance and Economics 3. Indian Financial Systems 4. Energy Economics | 25 | 75 | 100 |
| 39 | IV | Skillbased Subject | Paper – 4 | 3 | 3 | Human Resource Management – II | 25 | 75 | 100 |
| 40 | V | Extension Activities | | - | 1 | | 100 | 0 | 100 |
| | | | | 30 | 25 | | 250 | 450 | 700 |
| | | | | | | | | | |

| Part | Subject | Papers | Credits | Total Credits | Marks | Total Marks |
|----------|------------------------|-----------|---------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-7) | (5-7) | 100 | 1500 |
| Part IV | Environmental Studies | 1 | 2 | 2 | 100 | 100 |
| | Soft Skill | 1 | 1 | 1 | 100 | 100 |
| | Skill based subject | 4 | 3 | 12 | 100 | 400 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang&others/NME | 2 | 2 | 4 | 100 | 200 |
| | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

THIRUVALLUVAR UNIVERSITY

B.A. ECONOMICS

SYLLABUS

UNDER CBCS

(With effect from 2017-2018)

SEMESTER I

PAPER - 1

MICRO ECONOMICS I

Objective:

To equip the students with micro economic theories with graphic illustrations. To develop the skills of analysis and application of the principles to the real world problems.

UNIT-I: Definitions, Nature and Scope of Economics

Economic Laws-Difference between Micro and Macro Economics - Inductive and Deductive methods - Positive vs. Normative Economics-Static and Dynamic analysis.

UNIT-II: Consumption- Marshallian analysis

Utility- Law of Diminishing Marginal utility- Law of Equi Marginal Utility -Law of Demand-Elasticity of demand, types, measurements, importance and factors determining elasticity of demand- Consumer's surplus.

UNIT-III: Hicksian Analysis

Indifference Curve Analysis; meaning, properties and Consumer's Equilibrium using indifference curve analysis-Income Effect, substitution Effect and Price Effect - Hicksian Analysis of Consumer Surplus.

UNIT-IV: Production

Theory of the firm-Production Function; Law of variable proportion and law of returns to scale- Iso quant approach; producers and producers equilibrium.

UNIT-V: Cost and Revenue Functions

Cost concepts- Money cost, economic cost, real cost, opportunity cost; marginal cost, variable cost and fixed cost- short run and long run average cost curves- total , average and marginal revenue curves- relationship between AR and MR under perfect and imperfect markets.

BOOKS FOR REFERENCE

1. Ahuja, H.L.: Advanced Economic Theory - S. Chand & Co.,
2. Ashimakopoulos, A: An Introduction to Economic Theory: Micro Economics.
3. Bell & Todaro: Economic Theory - Oxford University Press.
4. Dewett, K.K. : Modern Economic Theory
5. Dwivedi: Micro Economics, Pearson Education.
6. Hutchinson: Economics - ACCA Series, London.
7. Joan Robinson & Eatwell : Introduction to Economic Theory
8. Koutsoyiannis, A: Modern Micro Economics - ELBS
9. Leftwitch : Price System and Resource Allocation
- 10 .Lipsey: An Introduction to Positive Economics - ELBS
- 11 .Lipsey & Steiner: Economics
12. Maddala: Micro Economics: Theory and Applications - McGraw Hill.
13. Maurice Dobb: Theories of Value and Distribution since Adam Smith - Vikas Publishing House, New Delhi.
14. Pindyck & Rubinfeld: Micro Economics - Pearson Education.
15. Salvatore Diulio: Principles of Economics - Schaum Series
16. Salvatore, Dominick: Micro Economics - Schaum Series.
17. Samuelson, Paul: Economics - McGraw Hill Kogakusha Ltd., London
18. Sankaran, S: Micro Economics - Margham Publications.
19. Stonier & Hague: Text Book of Economic Theory
20. Watson, D.S: Price Theory and its uses

PAPER - 2
STATISTICS FOR ECONOMICS

Objective

To apply statistical tools for economic problems.

UNIT-I: Introduction and measures of Averages

Definition, Nature, Significance and Limitations of Statistics - Primary and Secondary data-Formation of frequency Distribution- Classification and Tabulation, Multiple bar diagram, percentage bar diagram and pie-diagram. Averages- Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean, Merits and Demerits of the Averages.

UNIT-II: Measures of Dispersion and Skewness

Dispersion- Quartile deviation, Standard Deviation, Lorenz Curve , measures of variation, Skewness - Karl Pearson's and Bowley's measures of Skewness , Kurtosis.(concepts only)

UNIT-III: Correlation and Regression

Correlation – Types, Measurement of Correlation – Karl pearson's Coefficient of Correlation, Spearman's Rank Correlation and Concurrent Deviation Method. Regression-regression lines, simple regression models, difference between correlation and regression.

UNIT-IV: Time Series

Time series- Components of Time Series –Measurement of trend- Moving average, method of least square, Seasonal indices by simple average method.

UNIT-V: Index numbers

Index Numbers – problems in the construction of Index numbers – Methods of constructing Index numbers - Simple and weighted Index Numbers - Laspyre's, Paachee's, Fisher's Index Number - Fixed base and Chain base index numbers –Cost of living Index – Uses of Index Numbers.

BOOKS FOR STUDY

1. Gupta S.P : Statistical Methods
2. Pillai, R.S.N. & Bagavathi, V: Statistics

BOOKS FOR REFERENCE

1. Agarwal: Basic Statistics, New Age International
2. Elhance, D.N.: Fundamentals of Statistics
3. Hooda, R.P.: Statistics for Economics, Macmillan
4. Paden, D.W., & Lindquist, E.L.: Statistics for Economics and Business
5. Sweeney, Anderson and Williams: Statistics for Economics and Business, Thomson Publication.

ALLIED - 1
(to choose any 1 out of the given 4)

PAPER - 1
1. HISTORY OF INDIA I
(From 1885 to 1947 A.D.)

UNIT-I

The Rise and growth of Indian Nationalism - Birth of the Indian National Congress - The Programme and Activities of the Early Moderates (1885 - 1905) - Growth of Militant Nationalism (1905-1918) - Partition of Bengal (1905) - Swadeshi Movement - Surat Split (1907) - Birth of the Muslim League (1906) Growth of Revolutionary, Terrorists - Home Rule Movement - Lucknow Pact (1916) - Gandhiji and his ideas - Satyagraha - Rowlatt Act - Jallianwalabagh Massacre (1919).

UNIT-II

Indian Councils Act of 1892 - Development of Education - Lord Curzon - Raleigh Commission Indian Universities Act 1904 - Minto - Morley Reforms of 1909 - Growth of Public service. Mantagu - Chelms Ford Reforms 1919.

UNIT-III

Emergence of Gandhiji in Indian politics and his technique of mass mobilisation - Khilafat and Non-co-operation Movement (1919-1922) Swarajists - Boycott of the Simon Commission - From Dominion status to Poorna Swaraj.

UNIT-IV

Civil Disobedience Movement - The Round Table Conferences - Gandhi-Irwin Pact Communal Award - Poona Pact (1932) - Government of India Act, 1935 - Provisional Autonomy.

UNIT-V

The Congress Ministries and the Second World War Individual Satyagraha - League and Pakistan - Cripps Mission - Quit India Movement - Wavelplan - Indian National Army - Cabinet Mission - Mountbatten Plan - Partition of India - Indian Independence Act, 1947.

BOOKS FOR REFERENCE

1. Arjun Dev and Indira Arjun Dev : Modern India.
2. Bipan Chandra : Modern India
3. R.C. Majumdar & Others : An Advanced History of India Part III – Modern India
4. Bipan Chandra & Others : India's Struggle for Independence
5. Sumit Sarker : Modern India (1885-1947)
6. Grover B.L. : Modern India.
7. Aggarwal R.C. : Constitutional Development and National Movement of India
8. Spear, Percival : History of India - Volume II.

ALLIED - 1

PAPER - 2

2. AGRICULTURAL ECONOMICS

Objective

To provide a theoretical foundation for use in the analysis of Agricultural Economic problems, Emphasis has to be placed upon recognition of agricultural problems and solving them through relevant agricultural policies.

Unit-1 Importance of agriculture and non-agriculture sectors

Features of Agriculture- Importance of agriculture in the Indian economy- Relationship between agriculture and non-Agriculture sectors.

Unit-II Land reforms

Agriculture Development in India-Land reforms-causes for sub- division and Fragmentation of land holdings in India -contract farming India

Unit-III Agriculture Finance

Agricultural finance in India: Importance. Sources of agriculture finance, Rural indebtedness-causes for rural indebtedness

Unit –IV Agricultural production

Socio Economic aspects of agricultural production - Unit and size of agricultural enterprise - Family Farm - Cooperative and collective farms

Unit –V Agricultural productivity

Productivity in Agriculture-New Agriculture- New agriculture strategy- Green Revolution- Nature of Food Economy- Organic farming In India

BOOKS FOR REFERENCE

1. Benjamin, Hariroran & Karunagaran:Economics of Agriculture, S.Chand & Co.,
2. Bhattachargee, J.B.:Studies in Indian Agricultural Economics
3. Coben, R.C.:Economics of Agriculture, Cambridge University Press.
4. Datt & Sundaram:Indian Economy, S. Chand & C.,
5. Govt. of India.:Agricultural Marketing Reports, Govt. Publication.
6. Johnson, D.G.:Forward Prices in Agriculture, University of Chicago Press
7. Kohls & Uhl:Marketing of Agricultural Products, Prentice Hall of India.
8. Moore John and Khusro:Indian Food Grain Marketing.
9. Schultz, T.W.:Economic Organisation of Agriculture, McGraw Hill
10. Sethuraman, K:Agricultural Marketing, Margham Publications.
11. Sivaramaprasad: Agricultural Marketing - Mittal Publishers, TriNagar, Delhi.
12. Snodgrass, M & Walact,L.T.:Agricultural Economics and Resource Management
- 13.Vasant Desai: A Study of Rural Economics
- 14.Misra and Puri: Indian Economy,Himalaya publishing House Bombay
- 15.Ruddar Dutt and K.P.M.Sundaram: Indian Economy, S.Chand &Co.Ltd,NewDelhi
- 16.Sankaran A: Agriculatural Economy of India, Progressive Corporation, Pvt.Ltd.,
Bombay
- 17.Srivastava O.S.A: Agricultural Economics, Rawat Publications, Jaipur 1996

PAPER - 1

3. BASICS OF COMPUTER APPLICATION I

UNIT-I

Introduction to Computer Science:

History of Computers - Parts of a Computer - Sound and video - setting up the Computer - Buying a Computer - Starting the Computer - mouse and keyboard - monitor - disk drives - printer and scanner.

UNIT-II

Number systems - Binary, octal, decimal and hexadecimal number systems - conversion between number systems- binary coding - BCD - ASCII.

UNIT-III

Computer Architecture - CPU - memory - communication between various units of a Computer System - storage devices.

UNIT-IV

Input devices - Types - keyboard - mouse - Output devices - classifications of output - printers - monitors.

UNIT-V

Computer Program - developing a program - algorithm - flowchart - program testing and debugging - program documentation - Computer languages - Software.

Text Book

1. Learn, Computers step by step, Monica Disouza & Jude D'souza, Pearson education
2. Introduction to computer science, IITL Education solutions limited , Pearson education

PAPER - 1

4. FINANCIAL ACCOUNTING I

Objective for Financial Accounting and Cost and management accounting

To provide wide options for Economics students to enter into the fields like M.A. (Eco.) M.B.E., C.A., I.C.W.A., M.Com., M.B.F., M.I.B., and M.B.A. successfully. As per the University norms students who have studied two Accounts Papers alone are eligible to get admission in M.Com., During the present regime of Globalization to succeed in the business, Trade and in Entrepreneurial activities knowledge in Accounts are very much essential. To create manpower to cater to the needs of the emerging corporate sector.

UNIT-I

Introduction : Basic Accounting Concepts and Conventions - Groups interested in accounting - Accounting Equation - Journal - Ledger - Subsidiary Books - Trial Balance - Errors - Types - Rectification of Errors - Bank Reconciliation Statement.

UNIT-II

Final Accounts : Meaning - Preparation of Final Accounts - Trading Account - Profit and loss a/c Manufacturing a/c- Balance Sheet - Distinction between Trial Balance and Balance Sheet - Adjustment Entries.

UNIT-III

Depreciation Accounting : Meaning of Depreciation - Methods of Providing Depreciation - Fixed Percentage on Original Cost - Fixed Percentage on Diminishing Balance (including change in the method of depreciation).

UNIT-IV

Average Due Date : Meaning - Practical uses of average due date - basic problems in Average Due Date.

UNIT-V

Single Entry System : Definition - Salient features - Limitations - Differences between Single Entry System and Double Entry System - Methods.

BOOKS FOR REFERENCE

1. Grewal, T.S.:Principles of Accountancy, S.Chand & Co,
2. Guta R.L. & Gupta,V.K.:Financial Accounting, Sultan Chand & Sons.
3. Gupta, R.L. & Radhaswamy:Advanced Accountancy, Sultan Chand & Sons.
4. Jain & Naurang:Advanced Accounts, Kalyani Publishers.
5. Shukla & Grewal:Advanced Accounts Vol.I, S.Chand & Co.,

**SEMESTER II
PAPER - 3
MICRO ECONOMICS II**

UNIT-I: Market Structures and Equilibrium

Marshallian analysis of Time element - Perfect competition-Features-Price and Output determination in the short run and long run – Monopoly - Price and Output determination.

UNIT-II: Imperfect competition

Monopolistic Competition - Price and Output determination- wastages of Monopolistic Competition – Oligopoly – Duopoly (concept only)

UNIT-III: Distribution

Distinction between personal and functional distribution - Theories of Distribution- Marginal Productivity Theory - Rent - Ricardian Theory - Scarcity and differential rent - Modern theory of rent – Quasi-Rent.

UNIT-IV: Wages

Real and Money wages – Theories of Wages- Trade Union and wages.

UNIT-V: Interest and Profits

Classical theories of Interest - Loanable funds theory- Liquidity preference theory- Profits-Distinction between gross and net Profits-Theories of Profit.

**PAPER - 4
MATHEMATICS FOR ECONOMICS**

Objectives

To introduce mathematics as a tool to study economics and
To understand the application of mathematics in economic theory

Unit-I; Differential Calculus

Variables- constants- parameters- functions- limits- Derivatives of algebraic functions- Exponential. Logarithmic functions- Parametric differentiation-product and quotient rules- successive differentiation up to second order)- Partial Differentiation.

Unit-II;; Maxima and Minima Concepts

Scope of a curve- Maxima and Minima- points of inflexion- Euler's theorem- Lagrange's method.

Unit-III: Integral Calculus

Integration- Standard forms- definite and indefinite integrals- integration by parts- Area of a curve.

Unit-IV: Differential Equations

Homogeneous and linear Differential Equations.

Unit-V: Applications

Some illustrations of the applications of differentiation and integrations in Economic analysis.

BOOKS FOR STUDY

Metha, B.C.and Madnani,G.M.K.1997. Mathematics for Economics. Sultan Chand and Sons Publishers,New Delhi.

Books for Reference:

Weber,Jean.E.1982,Mathematical Analysis: Business and Economic Applications,Harper and Row Publishers,New York.

Sanchet.D.C.and Kapoor.V.K.,1983, Business Mathematics, Sultan Chand and Sons Publishers,New Delhi.

Yamane,Taro.1970. Mathematics for Economists: An Elementary Survey,Prentice Hall of India pvt,ltd,New Delhi.

ALLIED - 1

(to choose any 1 out of the given 4)

PAPER - 2

1. HISTORY OF INDIA

II (From 1947 to 2000 A.D.)

UNIT-I

Post Independent India - Making of the Constitution of the Indian Republic - Sardar Patel and the Integration of Princely States - Reorganisation of Indian States - Jawaharlal Nehru era - Growth of Economy, Planning, Science and Technology - Foreign policy - Panchsheel - Indo Chinese War 1962. Death of Nehru 1964.

UNIT-II

Kamaraj as the king maker - Lal Bahadur Shastri - Srimavo Shastri Accord - Indo - Pak war 1965 - Tashkent Declaration - Indira Gandhi - Elections of 1967 - Presidential Elections and the Congress split - 1969.

UNIT-III

Indira Gandhi - Domestic Policies - Green Revolution - Indo-Pak War 1971 - Indo Soviet Treaty of Friendship. Emergence of Bangladesh - Simla Agreement - India becomes a Nuclear power - Proclamation of Emergency - Total Revolution by Jayaprakash Narain - Emergence of the Janata Party rule and Morarji Desai 1977 - 80 - Chowdri Charansingh.

UNIT-IV

Indira Gandhi as PM for the Fourth time - crisis in the Punjab - Operation Blue Star - Assassination of Indira Gandhi and emergence of Rajiv Gandhi - New Domestic Foreign Policy and Development of Science and Technology. SAARC - Sri Lankan issue and Rajiv's assassination.

UNIT-V

Janata Dal rule under V.P. Singh - Mandal Commission Report - Chandrasekar P.V. Narashimha Rao - Panchayat Raj - New Economic Policy - Ayodhya issue - Janata Dal - Deva Gowda and I.K. Gujral - Emergence of the BJP as the Ruling Party - Vajpayee as the Prime Minister - Growth of Science, Education, and Information Technology till 2000 A.D.

Books for Reference

1. Arjun Dev and Indira Arjun Dev: Modern India.
2. Bipan Chandra : Modern India
3. Keshwani K.B. : History of Modern India 1800-1984
4. Publication Division : Planning and Economic Policy in India.
5. D.R. Gadgil : Planning and Economic policy in India
6. C.D. Deshmukh : Economic Development of India 1946 - 56
7. Drier Berg and Saria Jagamohan : Emergency in India Delhi, 1975
8. G. Venkatesan: History of Contemporary India.

PAPER - 2

2. AGRICULTURAL MARKETING

Objective

To provide a theoretical foundation for use in the analysis of Agricultural Economic problems, especially in the marketing. Emphasis has to be placed upon recognition of agricultural problems and solving them through relevant agricultural policies.

UNIT-I

Nature and significance of marketing - basic concepts of marketing and classification - the marketing processes - concentration, dispersion and equalisation - Dumping.

UNIT-II

Marketing functions - three classes of functions, functions of exchange, functions of physical supply and facilitation function - buying, assembling, selling, transporting, warehousing or storage - standardization and grading, financing, risk and market informations.

UNIT-III

Marketing of agricultural produce - marketing structure - regulated and organized markets - cooperative marketing bodies.

UNIT-IV

Wholesalers and Retailers - basic wholesale distribution structure - functions and services of the wholesaler, role of middlemen and the retailers

UNIT-V

Marketing of agricultural and agro-based industrial products to international markets - export promotion measures.

BOOKS FOR REFERENCE

1. Benjamin, Harioran & Karunagaran:Economics of Agriculture, S.Chand & Co.,
- 2 .Bhattachargee, J.B.:Studies in Indian Agricultural Economics
- 3 Coben, R.C.:Economics of Agriculture, Cambridge University Press.
- 4 Datt & Sundaram:Indian Economy, S. Chand & C.,
5. Govt. of India.:Agricultural Marketing Reports, Govt. Publication.
- 6 Johnson, D.G.:Forward Prices in Agriculture, University of Chicago Press
7. Kohls & Uhl:Marketing of Agricultural Products, Prentice Hall of India.
8. Moore John and Khusro:Indian Food Grain Marketing.
9. Schultz, T.W.:Economic Organisation of Agriculture, McGraw Hill
10. Sethuraman, K:Agricultural Marketing, Margham Publications.
- 11.Sivaramaprasad:Agricultural Marketing - Mittal Publishers, TriNagar, Delhi.
- 12.Snodgrass, M & Walact,L.T.:Agricultural Economics and Resource Management
13. Vasant Desai:A Study of Rural Economics

PAPER -2

3. BASICS OF COMPUTER APPLICATION II

UNIT-I

Information Technology Basics - Information definition - Prerequisites of Information - need for Information - components of information Technology - Role of Information Technology in Business.

UNIT-II

Word processing with MS Word : Starting MS Word - MS Word environment - working with word documents - working with text - working with tables - checking spelling and grammar - printing a document.

UNIT-III

Spreadsheets and MS Excel : Starting MS Excel - MS Excel environment - Working with Excel workbook - working with worksheet - Formulas and functions - Inserting charts - printing in Excel.

UNIT-IV

Making presentation with MS power point - starting MS power point - MS power point environment - working with power point - working with different views - designing presentation - printing in power point.

UNIT-V

Internet basics - Evolution - Basic Internet terms - Getting connected to Internet - Internet applications - Electronic mail - How email works - searching the web - Internet and viruses.

Text Book

Introduction to Information Technology, ITL ESL, Pearson Education.

PAPER - 2

4. FINANCIAL ACCOUNTING II

UNIT-I

Branch Accounts : Dependent Branches - Stock and Debtors System- Distinction between Wholesale Profit and Retail Profit - independent branch (foreign branches excluded).

UNIT-II

Departmental Accounts : Basis for allocation of expenses - Inter Departmental Transfer at cost or selling price - Treatment of expenses which cannot be allocated.

UNIT-III

Hire Purchase System : Meaning and Legal Position - Accounting aspects - Default and Repossession - Hire Purchase Trading account.

Installment Purchase System : Meaning and Legal Position - Distinction between Hire Purchase System and Installment Purchase System - Accounting Treatment.

UNIT-IV

Partnership Accounts : Admission of a partner - Retirement of a Partner - Death of a Partner - Dissolution of Partnership - Insolvency of a Partner - (Garner vs Murray) - Insolvency of all partners - gradual realisation of assets and piecemeal distribution.

UNIT-V

Mechanised System of Accounting : Advantages - Limitations - EDP.

SEMESTER III

PAPER - 5

INDIAN ECONOMY I

Objective

To acquire sufficient knowledge about India's Economic features; occupational structure and the relative shares of the different Sectors. Students should know that India is an emerging economic power in the World market.

UNIT-I

Features of less developed and developing Economies. - Economic and Non-Economic factors impeding Economic development - Concept of growth and development - Indicators - Factors in Economic Development.

UNIT-II

Capital Formation - Human and Physical, Savings and Investment pattern since 1991 - National Income - Methods, trends, limitation - Distribution - Recent trends in National Income - Black Money - Corruption.

UNIT-III

Human Resources - Human Resource Development Size and growth of population- Causes, impact- measures to control population- Recent Population Policy.

UNIT-IV

Agriculture - Its Contribution to Economic Development - Food Problems - Methods of solving it - Agricultural productivity - Land Reforms - Green Revolution

UNIT-V

Agricultural labour – Definition – Features- Problems – Remedies Agricultural Credit - Grameen Bank.

**BOOKS FOR
REFERENCE:**

1. Agrawal, A.N. : Indian Economy, Vikas Publishing House, New Delhi.
2. Alak Ghosh : Indian Economy, The World Press, Kolkatta.
3. Arora, R.C. : Integrated Rural Development, S.Chand & Co.,
4. Arthur Lewis : The Theory of Economic Growth.
India in Transition, Economic Policy Options, S.Chand &
5. Arun Ghosh : Co.,
6. Bimal Jalan : Indian Economic Crisis, Oxford University Press, Chennai.
7. Bright Singh : Economics of Development.
8. Dewett, Verma : Indian Economics, S.Chand & Co.,
&
Sharma
9. Dhingra, I.C. : Indian Economy, Sultan Chand & Co.,
Economic Reforms and Employment, Indian Economic
10. Hajela & : Association,
Goswami (E.D.) New Delhi.
Economics of Development & Planning, Konark Publishers,
11. Jhingan, M.L. : New
Delhi.
12. Kanka, S.S. : Human Resource Management, S.Chand & Co.,
13. Kindle berger : Economic Development.
14. Minhas : Planning for the Poor.
15. Mongia, J.N. : India's Economic Policies, Allied Publishers
(Editor)
16. Pndey, B.N. : Role of Science & Technology in Rural and Economic
Development
of India, S.Chand & Co.,
The Indian Economy, Poverty and Development, Vikas
17. Pramit : Publishing
Chaudhury House, New Delhi.
Labour Economics and Industrial Relations, Tata McGraw
18. Pramod Verma : Hill
Ray,
19. S.K. : Economics of Development - Prentice Hall of India.

PAPER - 6

MONETARY ECONOMICS- I

Objective

The students should have a clear and critical understanding of Indian Monetary system and policies involved in money supply and demand.

The circulation of money; its effects on the general price level and the consequent various banking policies be made understood.

UNIT-I

Barter System and its defects – Evolution of money - Functions and forms of money – Importance of money.

UNIT-II

Value of money – Quantity theory of money - Fisher's equation - Cambridge equation - General evaluation of the quantity Theory of money – Savings and investment Theory.

UNIT-III

Monetary standards- Gold standard - Paper currency - Systems of note - issue - Indian Currency System - Development and Problems.

UNIT-IV

Factors influencing money supply - Money supply and price level - Keynesian approach – Demand for money – Classical view – Keynesian approach.

UNIT-V

Neutrality of money - classical Dichotomy - Real Balance Effect - Friedman's Restatement of quantity Theory.

**BOOKS FOR
REFERENCE:**

1. Basu, C.R. : Central Banking in a Planned Economy
2. Chadler, L.V. : Economics of Money and Banking.
3. Clower (Editor) : Monetary Theory
4. Dekoch, M.H. : Central Banking
Dimitris N
5. Chorafas : Chaos Theory in the Financial Markets, S.Chand & Co.,
6. Ellsworth, P.T. : International Economics
7. Goulbertson : Money and Banking
8. Gupta, G.P. : Monetary Policy of the RBI
9. Halm, G.N. : Monetary Theory
: Monetary Theory and Practice, ELBS McDonald & Evans
10. Hanson, J.L. Ltd.,
London
11. Mithani, D.M. : Money, Public Finance and International Trade, Himalaya
Publishing House.
12. Newlyn & Bootle : Theory of Money - Clarendon Press, Oxford.
13. RBI Publication : RBI Bulletin
14. Sankaran, S : Monetary Economics, Margham Pub.
15. Sethi, T.T. : Monetary Economics, S.Chand & Co.,
16. Suraj, B. Gupta : Monetary Economics, S.Chand & Co.,
Banks and Specialised Financial Intermediaries in
17. Wellons, Philip; : Development,
Germidi's and Oxford IBH Publishing Co.,
Glavanis

ALLIED - 2
(to choose 1 out of the given 4)

PAPER - 3

1. ECONOMICS OF ENTREPRENEURSHIP

Objective

The twenty first century has dawned with entrepreneurship as a major force shaping the global economy. The future growth of this economy lies in the hands of men and women committed to achieving success through innovative customer focussed new products and services. Therefore it is high time that the students had a glimpse of a few aspects of entrepreneurship.

UNIT-I

Entrepreneurs - Concepts and qualities- Definitions - Entrepreneur - Traits and types - Functions - Motivation - Project identification - Classification - Formulation of Network and Project Design - E-commerce and entrepreneurship.

UNIT-II

Steps for starting a small scale industry - selection of types of organisation - Export and Import - State Trading Corporation - Liberalisation - Privatisation - Small Scale Industry - Problems and sickness of small scale industry - Government Policy.

UNIT-III

Women Entrepreneur - Concept - Growth and - Functions - Rural women entrepreneurs - Problems of Women Entrepreneur - Role of Women's Association.

UNIT-IV

Financial Analysis - Institutions helping entrepreneurs - Role of Commercial Banks - New Entrepreneurial Development Agencies - Entrepreneurs in Tamilnadu.

UNIT-V

Entrepreneurial Development Programme (EDP) of India - Backward Area Development - Small Companies "going global"

**BOOKS FOR
REFERENCE:**

1. Bhaltha Charjee : Entrepreneurial Development, Himalaya Publications
2. Coulter : Entrepreneurship in action, Prentice Hall of India.
3. Edward F : The Rational Investor, S.Chand & Co.,
Marvicka, Jr.
4. Gupta & : Entrepreneurial Development, S.Chand & Co,
Srinivasan,N.P.
5. Jayashree Suresh : Entrepreneurial Development, Margham Publications.
6. Khanka : Entrepreneurial Development, S.Chand & Co.,
7. Lankan Pal : Entrepreneurial Development
8. Manimala : Entrepreneurship Theory at Cross Roads, S.Chand & Co.,
9. Nandan : Fundamentals of Entrepreneurship, Prentice Hall
10. Rastogi : Reengineering and Re-inventing the enterprise, S.Chand &
Co.,
11. Robert D.Hisrich & : Entrepreneurship, Tata McGraw
Hill Michael P.Peters
12. Saini: Entrepreneurship, Theory and Practice, S.Chand & Co.,

PAPER - 3

2. ECONOMIC DEVELOPMENT OF TAMILNADU I

Objective

As a student of Economics, one should know the relevance of Regional Economics and its share in the National Economy. Tamilnadu is one of the industrialised States and a major economic power in South India. This paper will give an interesting analysis of the occupational structure, the relative shares of the different Sectors in the SDP and the future thrust areas of the State Plan.

UNIT-I

Relevance of Regional Economics - The place of Tamilnadu in the National Economy
Scene - Basic characteristics : Size - Demography - Urbanization - Literacy - Resources
Endowment, Land, Soil, Minerals, Water, Forests - Coast Line.

UNIT-II

Development experience of Tamilnadu - Trends in SDP - Per capita SDP - Composition
of SDP - Sectoral Contribution - Inter-State Comparison .

UNIT-III

Infrastructure : Transport - Railways, Roads - Nationalization of Road Transport -
Performance of Roadways Corporations - Power - Trends in demand and supply - Rural
electrification - Banking Coverage - Credit - Deposits and advances - Housing - Slum
Improvement.

UNIT-IV

Development in agriculture - Changes in land use pattern, cropping pattern, and crop
intensity.

UNIT-V

Index of Agricultural production and productivity - Green Revolution - Productivity and
yield - Agricultural Marketing - Animal husbandry - Fisheries

BOOKS FOR REFERENCE:

1. Department of Statistics : Statistical Abstract of TamilNadu
2. Department of Evaluation and Applied Research of Tamil Nadu,
Finance Department of T.N. : An Economic Appraisal Annual Issues
3. T.N. Govt. : Public Enterprises in TamilNadu
4. Government of India, : India - A Reference Manual
5. Govt. of T.N. : Tamilnadu Budget Documents
6. Govt. of T.N. : Hand Book of Statistics Tamil Nadu
7. Govt. of T.N. : State Five Year Documents
8. Govt. of T.N. : The Perspective Plan for Tamil Nadu
9. Perumalswamy : Economic Development of Tamil Nadu
10. Rajalakshmi : Economic Development of Tamil Nadu
Tamil Nadu Economy, St. Joseph's College,
11. Fr. Leonard : Tiruchy.

PAPER - 3
3. WOMEN AND THE ECONOMY

Objective

Women constitute nearly half of the population but they could not contribute their due share in the economic progress. The students should know the factors which obscure their prowess, so that they can evolve practicable policies and schemes for a proper utilisation of women power in the task of building a powerful Nation.

Unit – I

Women as Human resource –Women and economic development –Contribution of women to GNP.

Unit – II

Economic role of Women in European, American, Asian, African countries, Russia – Women in the development of South East Asian region.

Unit-III

Demographic and futurological issues – Gender ratio - Age composition – Regional differences Rural, Urban, Tribal Women in India- Women in Organized and unorganized sectors –problems faced by women.

Unit –IV

Investment in Women – Human capital theory –Role of Women in economic development of India before and after independence.

Unit – V

Health and Education of Women in India –Population policy of Women in India – International comparisons.

**BOOKS FOR
REFERENCE:**

1. Boserop : Women's Role in Economic Development
2. Gosh, S.K. : Women in a Changing Society, Asia Publishing House.
3. Jain Devaki : Women in a Developing Economy
4. Kapur Promila : Changing status of the working women in India, Vikas
5. Ranade, S.N. & : Women and Employment
Ramachandran.P
6. Srinivasa, M.N. : Status of Women, Oxford University Press.

PAPER - 3

4. COST AND MANAGEMENT ACCOUNTING I

UNIT-I

Introduction : Cost Accounting - definition - Meaning and Objectives - Advantage and Importance - distinction between Cost Accounting and Financial Accounting.

UNIT-II

Elements of Cost : Material - Purchase Order - Goods Received Note - Bin Card - Stores Ledger - Purchase, Receipt and Inspection - Inventory Control - ABC Analysis - EOQ - Ordering Levels - Methods of Pricing Material Issues.

Labour - Methods of incentive (Bonus) Schemes - Treatment of Overtime and Idle time - Labour turnover.

Overheads - Classification - allocation and apportionment - redistribution of overheads including Machine Hour Rate.

UNIT-III

Cost Sheets: Preparation of Cost Sheets - Preparation of Tenders and Quotations.

UNIT-IV: MANAGEMENT ACCOUNTING

Introduction: Management Accounting - Definition - meaning and objectives - advantages and importance - distinction between Management Accounting and Cost Accounting - Tools and techniques of Management Accounting.

UNIT-V

Budgeting and Budgetary Control : Types of Budgets - Sale budget - Production Budget - Materials budget - Labour Budget - Overhead Budget - Cash Budget including Flexible Budget.

BOOKS FOR REFERENCE:

1. Batty, J. : Management Accountancy, ELBS Edition
2. Brown & Howard : Managerial Accounting & Finance, ELBS Edition
Principles of Management Accounting, Sultan Chand &
3. Maheshwari, S.N. : Son.,
Cost and Management Accounting, Taxmann, New
4. Ravi, Kishore,M : Delhi

SKILL BASED SUBJECT

PAPER - 1

MARKETING COMMUNICATIONS & ADVERTISEMENT I

UNIT-I

Communications in Marketing : Nature and Significance of Communications - Communication process steps in promoting effective marketing communication.

UNIT-II

Methods of Marketing Communication: Personal selling - Public relations - Sales promotion - Sales management – On line –Retail trading.

UNIT-III

Advertisement: Definition – Types of Advertisement features and importance in modern marketing - Strategies and methods of achievements.

BOOKS FOR REFERENCE:

1. Ampler : Marketing from Advertising to Zen
2. Barthwal R.R. : Industrial Economics – New Age. International.
3. Belch : Advertising and promotion Tata MC Graw Hill.
4. Chandran J.S., : Essential of Advertising Oxford Jagjit singh and P.N.Malhan and IBH Publishing
5. Chunnawala, & : Foundations of Advertising – Theory K.C. Setnia and practice
6. David J.Luck & : Marketing Strategy and plans O.C. Ferrell prentice hall of India.
7. Frank Jerkins : Advertising made simple. Rupa & Co, New Delhi,
8. Jefkins : Advertising.
9. Olto Kuppnar : Advertising procedure prentice Hall.
10. Phillip Kotler : Marketing Management – Analysis planning and control prentice Hall.
11. Rustom Davar, : Salesmanship and Advertising Sohrab Davar & Progressive Corpn Bombay Nusli Davar

NON MAJOR ELECTIVE

PAPER - 1

FUNDAMENTALS OF ECONOMICS I

To introduce the basic concepts of economics to other discipline students

UNIT-I

Definitions, Meaning and scope of Economics Nature of Economic Laws.

UNIT-II

Economics Systems - Capitalism - Socialism and mixed Economy.

UNIT-III

Consumer's behaviour wants - Utility - Demand Meaning - Law - Exceptions.

BOOKS FOR REFERENCE:

1. Ahuja, H.L. : Advanced Economic Theory S.Chand & Co
2. Dewett K.K : Modern Economics Theory
3. Lipsey and Steiner : Economics
4. Sankaran.S. : Micro Economics Margham Publications.
5. Agrawal, A.N. : Indian Economy – Vikas Publishing House.
6. Dewett, Verma, Sharma : Indian Economy – S.Chand & Co
7. Rudar Datt & Sundaram : Indian Economy – S.Chand & Co
8. Sankaran.S. : Indian Economy - Margham Publications

SEMESTER IV

PAPER - 7

INDIAN ECONOMY II

UNIT-I

Role of Technology - Information Technology BPO in India - their impact on Economic Development – Cyber Crime.

UNIT-II

Role of industries - Cottage & Small Scale industries - Some Large Scale industries (Cotton, Sugar, Iron & Steel, Tea & Petro Chemical) Industrial Policy - 1991 and after - Public sector Enterprises - Dis-investment and Privatisation.

UNIT-III

Transport - Importance of Transport (Roadways, Railways, Shipping and Civil Aviations) to Economic growth - Evaluation of Government in Policy in relation to privatisation policy - Transport Coordination.

UNIT-IV

Planning in India - Strategy of Indian Planning - Resources for Financing Plan - Agriculture and Industrial Development - Planning techniques - Investment Priorities – General Objectives – Targets, Achievements and Failures – 11th and 12th five year plans- NITIAYOG

UNIT-V

Poverty in India - Poverty Eradication Programmes - Recent Employment scheme- Swaraj Bharat Mission - Role of Micro finance - (SHG, Cottage and Household Sector etc.) - Regional Development Disparities -India's Foreign Trade and Balance of Payments.

PAPER - 8

MONETARY ECONOMICS II

UNIT-I

Inflation - causes - types and remedies - Inflationary Trend in India –Deflation - Trade Cycles - Phases - Theories - Measures to control

UNIT-II

Commercial Banking - Types and Functions - Balance Sheet - Creation of Credit - Nationalisation of Banks' - Objectives and Performance.

UNIT-III

Progress of Indian Banking during post-Nationalization Period - Development Banks and other term financing Institutions in India.

UNIT-IV

Central Banking - Nature and functions – RRB-Co-operative Bank -Instruments of credit control - its efficiency and limitations.

UNIT-V

Functions of the RBI - It's role in Agricultural and Industrial Development - RBI and credit control - Objectives and Limitations - RBI and Monetary Policy.

ALLIED - 2
(to choose 1 out of the given 4)
PAPER - 4

1. Basic Econometrics (Elective)

Objectives

- To get acquainted with the tools of Econometrics for applied research in Economics.
- To impart the knowledge of econometric techniques for better understanding of the methods in Economics.

Unit - I: Nature and scope of Econometrics

The econometric approach— economic theory - Statistics and econometrics – Nature and use of econometric models.

Unit - II: Linear Regression

Two variable regression – Multiple regression – Correlation coefficient – Multicollinearity – Extensions of linear regression – functional forms – dummy variables – Analysis of variance.

Unit - III: Generalized Least Squares

Heteroscedastic errors – Auto correlation – Errors in variables – Methods of instrumental variable – grouping of observations and grouping of equations.

Unit - IV: Simultaneous Equation Methods

The problem of identification – Estimation – Two stage least squares – introduction to limited information and full information – maximum likelihood and three stage least squares.

Unit - V: Application of Econometric Models

Application of single equation technique in demand analysis — Aggression problem, Engle's Law, Slutsky's theorem, the consumer's allocation problem — model in relative prices, aggregation over consumers. Estimation of demand function under different conditions, properties of the estimators — static and dynamic analysis. Estimation of consumption function — Cross section and time series. Estimation of Production functions: Cobb Douglas.

Text Book:

Gujarati, Damodar. Basic Econometrics. Singapore, McGraw Hill Inc., 1995.

References:

1. Johnston, J. Econometric Methods. Singapore, McGraw Hill Inc., 1994.
2. Johnson, Aaron. C Jr et al. Econometrics: Basic and Applied. New York, Macmillan Publishing Co, 1987.
3. Maddala, G.S. Econometrics. New York, McGraw Hill, 1997.

PAPER - 4

2. ECONOMIC DEVELOPMENT OF TAMILNADU II

UNIT-I

Industrial Development : Major Industries - Cotton, Textiles, Sugar, Cement, IT - Automobiles - Leather Processing - Small Scale Industries - Cottage Industries - Light Engineering Goods.

UNIT-II

Index of Industrial Production - Change in the industrial structure - Investment - Export value added - Employment - Number of registered factories - State aid to industrial development - State sponsored Corporations - sources of Data.

UNIT-III

Social inputs in developmental efforts - Education - Health - Nutrition - Water Supply - Environmental improvement - Natural Disaster Management.

UNIT-IV

Planning - Objectives - Targets - Sectoral allocation - Performance - Problems of poverty and unemployment. State Finance - Sources of Finances - Pattern of expenditure - Central assistance.

UNIT-V

Recent welfare Measures : Various schemes of TN Govt. - impact on the society.

PAPER - 4

3. DEVELOPMENT ECONOMICS

Objective : To introduce the basics of Development Models.

Unit –I

Growth and Development – Meaning –objectives – relevance of economic development – Measurement of economic development – Development gap.

Unit –II

Basic assumptions of Growth Models –The HarrodDomar Model and its applications – The Kaldors Growth Model.

Unit –III

The stages of Growth Model – Rostow- Lewis Model –Nurkse balanced Growth model – Leibenste in Model .

Unit – IV

The Fei –Ranis Model –The wage goods Model –A critique of Dual economy Model - The Mahalanobis Model.

Unit – V

Resource allocation and choice of technology – Appropriate and inappropriate technology- Linear programming and development planning

PAPER - 4

4. COST AND MANAGEMENT ACCOUNTING II

UNIT-I

Methods of Costing : Unit Costing - Job Costing - Process Costing (Excluding equivalent production and interprocess profits) (Simple problems only)

UNIT-II

Analysis of Financial Statements : type of Financial Analysis - Techniques – Limitations.

UNIT-III

Ratio Analysis - Meaning – Classification – Advantages - Limitations.

UNIT-IV

Funds Flow and Cash Flow Analysis: Schedule of Changes in Working Capital - Preparation of Funds Flow Statement - Preparation of Cash Flow Statement - Importance of Cash Flow and Funds Flow Analysis - Difference between funds flow statement and cash flow statement. (Simple Problems)

UNIT-V

Management Reporting : Management Reporting System - Essentials of Good System - Modes of Reporting - Requisites of a Good Report - Steps for Effective Reporting - Kinds of Reports.

SKILL BASED SUBJECT

PAPER - 2

MARKETTING COMMUNICATIONS & ADVERTISEMENT II

UNIT-I

Advertisement Media :

1. Print Media : News papers, Magazines, Trade, Journals, etc.,
2. Out door media, Posters - Neon Signs - Vehicular Publicity - Sky advertisement - Sandwich men etc.,
3. Other media : Electronic media - Direct mail etc Their merits and limitations.

UNIT-II

Media scene in India - Problems of reaching rural audience & Markets - Exhibitions and Mela press conference

UNIT-III

Media planning: Selection of Media category - Their reach, frequency & Impact. Media scheduling. Evaluation of Advertising Effectiveness. Advertising Agencies - their role Regulation of Advertising; Misleading advertising and false claims.

NON MAJOR ELECTIVE

PAPER - 2

FUNDAMENTALS OF ECONOMICS II

UNIT-I

Government and the Economy planning – planning commission-**Nitiayog**-Meaning - India's Five year plans.

UNIT-II

National Income: Meaning - Methods of Calculating National Income - Difficulties and methods to overcome the difficulties - Recent trends in India's National Income and Percapita income.

UNIT-III

New Economic Policy - Liberalisation - Privatisation and Globalisation - impact in India.

SEMESTER V

PAPER - 9

MACRO ECONOMICS I

SEMESTER V

PAPER-9

Objective

To make the students understand the important of macro economic concepts like employment, income, interest money, investment, monetary and fiscal policy etc., and their mutual dependence in achieving the National goal.

UNIT-I

Nature of Macro Economics-Macro Economic Variables, Macro Statics, Comparative Statics and Dynamics, stock and flow, Macro Economic Models.

UNIT-II

National income –Concept and measurement –GDP-GNP-Importance and uses of national income analysis.Circular flow of income, difficulties in measuring national income, social accounting.

UNIT-III

Classical theory of employment, and output -say's Law of market , Keynesian theory of income, output and employment , aggregate demand and aggregate supply, principles of effective demand.

UNIT-IV

Consumption function-keynesian psychological consumption function and its implications, Determinants of consumption function.

UNIT-V

Investment function - keynes – autonomous and induced investment - Marginal Efficiency of Capital (MEC) and rate of interest.

**BOOKS FOR
REFERENCE:**

1. Ahuja, H.L., : Macro Economics, Theory and Policy, S.Chand & Co.,
2. Amit Bhaduri : Macro Economics, Macmillan Co.
3. Barro, Robert.J : Macro Economics, John Wiley and Sons, NewYork
4. Brooman : Macro Economics
5. Crouch : Macro Economics
6. Dernberg & McDougal : Macro Economics
7. Dillard, D : Economics of J.M.Keynes
8. Duesen berry, James,S : Business Cycles and Economic Growth, McGraw Hill
9. Eugene A Diulio : Macro Economic Theory - Schaum Series, McGraw Hill Book Company
10. George Leland Bach : Macro Economics: Analysis, Decision Making and Policy, Prentice Hall
11. John Evans & Pritchard : Macro Economics, Macmillan
12. Lindaver : Macro Economics
13. Michl : Macro Economic Theory, Prentice Hall
14. Raghbendra Jha : Contemporary Macro Economic Theory & Policy, Wiley Eastern Ltd.,
15. Sankaran, S : Macro Economics, Margham Publications.
16. Shapiro, E : Macro Economic Analysis
17. Turnovsky : Methods of Macro Economic Dynamics, Prentice Hall.
18. M.L.Jingan : Advanced Economic Theory, Vrinda Publishing (P) Ltd
19. M.C. Vaish : Macro Economic Theory, Vikas Publishing House (p) Ltd

PAPER - 10

FISCAL ECONOMICS I

Objective

Everybody takes an inquisitive interest in the core functions of our Govt. viz. taxation, development expenditures and loans. This paper will enable the students to gain deeper and wider knowledge of the Indian Fiscal Tools and policies as well as tax structure and reforms. Centre State financial relationship is another sensitive area which students of economics are entitled to appreciate the problem and come out with amicable policies.

UNIT-I

Definition; Nature and Scope of Public Finance - Distinction between private and public finance - The principle of Maximum Social Advantage - Need for Government activity

UNIT-II

Public Revenue: (a) Sources and main heads - distinction between tax and other sources - Canons of taxation (b) Theories of taxation c) Impact, shifting and incidence of taxation (d) Effect of taxation on production and distribution - Other effects. (e) Taxable capacity : Absolute and Relative taxable capacity. Factor determining taxable capacity - limits to taxable capacity

UNIT-III

(f) Individual taxes with special reference to India - Income tax, expenditure tax, wealth tax, Property tax, Estate duty, Gift tax, capital gain tax, Death duty, Agricultural Income tax, Corporation Income tax, Customs Duties, Excise Duties, Sales tax, Value added tax, Modified Value Added Tax - Land Revenue - Service Tax, Education Cess (g) Non-tax Revenue (h) Sources of Revenue for Central and State Government in India.

UNIT-IV

Public Expenditure : Main heads of public expenditure - Growth of public expenditure - Effect of public expenditure.

UNIT-V

Public Debt. : Need - Classification and burden of Public Debt. - Methods of repayment

BOOKS FOR REFERENCE:

1. Baidyanath Misra : Economics of Public Finance, S.Chand & Co.,
2. Bhargava, R.N. : Indian Public Finance
3. Bhatia : Public Finance
4. Cauvery, Sudha : Public Finance, S.Chand & Co.,
Nayak
5. Chelliah, R : Fiscal Policy in Under Developed Countries
6. Dalton, H : Principles of Public Finance
: Indian Economy (Environment Policy) Sultan
7. Dhingra, I.C. Chand.
8. Govt. of India : Reports of Finance Commissions
9. Hicks, U.K. : Public Finance
Public Finance in Theory and Practice, McGraw
10. Musgrave and : Hill
Musgrave
11. Prest, A.R. : Public Finance in Under Developed Countries
12. Sankaran, S : Fiscal Economics, Margham Publications.
13. Saxena & Mathur : Public Finance, K.Nath & Co.,
14. Shoup, Carl : Public Finance
: Public Finance in Theory and Practice, S.Chand
15. Singh, S.K. & Co
Public Finance Theory and Practice, S.Chand &
16. Sundaram, K.P.M : Co.,
and Andley, K.K.

PAPER - 11

MANAGERIAL ECONOMICS

Objective

To make the students understand the application of economic tools and logic to business decision making; demand forecasting and pricing methods.

UNIT-I

Definition, Meaning, Nature and Scope of Managerial Economics - Economics and Managerial Economics - Demand Fore-Casting : Meaning - Purpose & methods - Criteria for good fore - Casting.

UNIT-II

Managerial Decision Making : Risk and Uncertainty - Classification of Managerial Problem - Decision taking under certainty and uncertainty - Cost control & Cost Reduction.

UNIT-III

Pricing Methods - Full cost Pricing, target pricing, Going rate pricing - customary pricing, differential pricing - Specific pricing methods - pricing a new product - pricing over the life cycle of a product - product line pricing - mark up and mark down pricing by retailers - Resale price maintenance - Duel pricing - Brand Value.

UNIT-IV

Profit and Profit Management - Accounting profit and Economic profit - Theories of profit.

UNIT-V

Capital Budgeting : Need for Capital Budgeting - forms of capital Budgeting - Nature of Capital budgeting problems - project profitability : Methods of Appraising project Profitability.

**BOOKS FOR
REFERENCE:**

1. Boumal, William,J. : Economic Theory and Operation Analysis.
2. Cauvery.R : Managerial Economics, S.Chand & Co.,
3. Davies & Hughes : Managerial Economics
4. Hague, D.C. : Managerial Economics
5. Joel Dean : Managerial Economies, Prentice Hall
6. Maheshwari : Managerial Economics, Prentice Hall of India.
Managerial Economics, Concepts & Cases, Tata McGraw
7. Mote; Samuel Paul : Hill
and G.S.Gupta
8. Naylor, Vernon and : Managerial Economics, McGraw Hill
Wertz
9. Peterson & Lewis : Managerial Economics, Pearson Education.
10. Pylee; : Managerial Economics, S.Chand & Co.,
Sankaranarayanan
and Payyappilly
11. Randolph & Posner : Effective Project Planning and Management, Getting the
Job
Done, Prentice Hall
12. Sankaran, S : Managerial Economics, Margham Publications.
13. Savage and Small : Introduction to Managerial Economics
14. Spencer, M.H. : Managerial Economics, Text, Problems, Short Cases

PAPER - 12

INDUSTRIAL ECONOMICS

UNIT-I

Private – Public – Joint sectors – Large – Medium – Small industries – Multi National Corporations: Meaning and extend of operation – Merits and Demerits of MNCs and Transnational Corporations.

UNIT-II

Industrial Location theory of Weber – Sargen Florence – Losch's theory – Factors influencing location.

UNIT-III

Industrial relations – Trade Unions – industrial disputes settlement machinery in India.

UNIT-IV

Break Even Point – Cost Benefit Analysis – their importance to management.

UNIT-V

Industrial Finance – Sources – Institutions – constrains – Need for foreign capital.

BOOKS FOR REFERENCES:

1. A.N. Agarwal – Indian Economy – Wiley Eastern Ltd – 1993 (Ch:31)
2. Misra and Puri – Indian Industrial Economy – Himalaya Publishing House. 1989(Ch: 24)
3. S.C Kuchal - The Industrial Economy of Indian- Chaithanya pub. Allahabad. 1987 (Ch.31)
4. B.N. Narayan. Industrial Economics – Anmol publishing private Ltd (Ch: 14, 15, 20, and 22)
5. K.V. Srivastava and V.B.M. Das – Indian Industrial Economy- S.Chand 1975(Ch:11)
6. S.B.Srivastava- olitical guide to Industrial Entrepreneurs-S.Chand.1975(Ch.11)
7. D.S. Awasti –Economics of rivatisation
8. D.S. Awasti – Globalisation of Indian Economy.

ELECTIVE
(to choose 1 out of the given 4)

PAPER - 1

1. ENVIRONMENTAL ECONOMICS I

Objective

Economic development and general welfare of a society largely depend upon a pollution free environment. This bond between Environment and Economics is sure to motivate the future generation to undertake environment friendly economic activities.

UNIT-I

Theory and Concepts : Definition - Environment inter-linkages - Identification of the basic issue in preserving environmental quality - Tragedy of commons - Pollution as an externality - Material balance approach - Components of the Environment - Environmental quality as a Public Good.

UNIT-II

Environmental issues in Indian Economy : Environmental Pollution - Air Pollution, Water Pollution, Land Pollution, Marine Pollution, Noise Pollution - Role of an individual in prevention of pollution.

UNIT-III

Welfare Economics and Environmental Economics - Pareto optimality - Cost Benefit analysis - Private cost - Social cost, Pollution Cost - Pollution Control Cost -Evaluation of Environmental Benefit.

UNIT-IV

Population and Environmental Problems : Trends in global and National population levels - Consequences on environmental quality - problems of urbanization and Environmental quality in India - Environment and human health.

UNIT-V

Economic Growth vs. Environmental Quality - Problems of Environmental Quality global level - Problems of Environmental Quality in developed economies - Problems of Environmental Quality in developing economies - Nature of Environmental Problems in India.

BOOKS FOR REFERENCE:

1. Baumol, William, J : Economics, Environmental Policy and Quality and Wallace
E.Oates of Life (Prentice Hall)
2. Burraus Paul : The Economic Theory of Pollution Control (Martin
Robertson)
3. Chatterji : Energy & Environment in the Developing Countries (John
Wiley
& Sons, NY)
4. Jayant : India's Environment Crisis & Responses (Natraj
Babdhopadhyay : Publishers)
5. Joseph J.Sereca and : Environmental Economics (Prentice Hall)
Micheal. K. Taussi.
G
6. Karpagam, M : Environmental Economics, A Text Book (Sterling, New
Delhi)
7. Kneese, A.V. : Economics & Environment (Penguin Books)
8. Mahajan, V.S. : Energy Development in India, Issues, Trends & Alternative
Sources (New Delhi, Deep & Deep Publishers)
9. Pearce, D.W. : Environmental Economics (MacMillan)
10. Robert Dorfman & : Economics of Environment (W.W.Northan & Company,
NY) Nancy S.Dorfman

PAPER - 1

2. INTERNATIONAL TRADE I

Objective

To familiarise the students with the postulates of trade theories and international institutions. To develop the analytical skill of the students for identifying international economic problems and relations and the complexities in foreign trade especially during the present day WTO regime, where the main thrust is towards Globalisation.

UNIT-I

Nature and importance of International Trade - Theories of Foreign Trade - Adam Smith, Ricardo, Haberler's and Heckscher – Ohlin.

UNIT-II

Free Trade Vs. Protection - Cases for and against - transfers - Meaning and types - Effects of Tariffs - Using partial and General Equilibrium - Quotas - Meaning, types - Effects of quotas on Imports - Dumping - Antidumping measures.

UNIT-III

Facets of Globalisation, Liberalisation and privatization and their impact on Indian Economy MNCs, TNCs.

UNIT-IV

Foreign Exchange - Exchange rate - Meaning - Demand and supply of Foreign Exchange - Foreign Exchange Market - Functions.

UNIT-V

Purchasing power Parity Theory - Fixed and Floating Exchange Rates - Devaluation - Convertibility - Euro - dollar.

**BOOKS FOR
REFERENCE:**

1. Agarwala, P.N. : India's Export Strategy, Vikas Publishing House.
2. Albaum : International Marketing & Export Management, Pearson Education.
3. Chaudhuri, B.K., : Finance of Foreign Trade and Foreign Exchange, Himalaya Publishing House.
4. Ellsworth, P.T. : International Economics
5. Hander; Ashok,K, : Devaluation Policy of the Indian Economy, S.Chand & Co., Jagdish & Nigam
6. Jain : Managing Global Competition, Achieving World Class Performance, S.Chand & Co.,
: The International Economy, Prentice Hall of India Pvt., Ltd., New Delhi.
7. Kenan, P.B. : International Economics
8. Kindleberger, C.P. : International Economics
9. Krugman, P.R. & Obstgold : International Economics
10. Maurice Levi : International Finance, McGraw Hill Publications.
11. Meier, Gerald, M : International Economics, The Theory of Policy, Oxford University Press.
12. Ramappa : Intellectual Property Rights, S.Chand & Co.,
: International Economics Theory & Problems,
13. Salvatore, D.L., McGraw Hill
14. Sawyer & Sprinkle : International Economics, Prentice Hall of India.
15. Sharan : International Business, Pearson Education.
16. Shiva Ramu : Globalisation The Indian Scenario, S.Chand & Co.,
18. Sodersten, B.O. : International Economics
19. Velayutham : Foreign Trade, Theory and Practice, S.Chand & Co.,

PAPER - 1

3. INDUSTRIAL ORGANISATION I

Objective

Management is an offshoot of Economics. Principles of organization, management, labour cooperation and participation in management are some areas of interest to students of Economics. This will infuse a sense of leadership into them.

UNIT-I

Industrial Management - Principles of organization - Organizational Process, Delegation and Decentralization forms of Internal Organization. Industrial Productivity and efficiency.

UNIT-II

Scientific Management - Standardization - Rationalization - automation.

UNIT-III

Capital structure - Over Capitalization, under - Capitalization trading on equity, watered capita.

UNIT-IV

Theories of Location, Factors, Government Policies - Layout measuring, Plant, Process.

UNIT-V

Production Management - Planning Control, Quality Control, Inspection.

**BOOKS FOR
REFERENCE:**

1. Bathy, S : Fundamentals of Industrial Organisation.
2. Chatterjee : Modern Business.
3. Donald A.Hay & Press. Derek J.Morris : Industrial Economics : Theory and Evidence - Oxford
4. Elbourne : Fundamentals of Industrial Organisation.
5. Jain & Narang : Cost Accounting
Industrial Organisation : Theory and
6. John Woodward : Practice.
7. Kanka, S.S. : Organisational Behaviour, S.Chand & Co.,
8. Kimball & Kimball : Fundamentals of Industrial Organisation
: Readings in The Economics of Industrial
9. Needham, D Organisation
10. Rao, V.S.P. and Narayan,P.S. : Principles and Practice of Management.
11. Sherlekar & Sherlekar : Modern Business Organisation and Management
12. Sivayya, K.V. & Das,V.B.M. : Indian Industrial Economy, S.Chand & Co.,
13. Tirole, Jean : The Theory of Industrial Orgnaisation, Prentice
Hall

PAPER - 1

4. ECONOMICS OF CAPITAL MARKET AND DIGITAL ECONOMY I

Objective

India has emerged as a “Thought Leader” in several areas of information technology (I.T.). It is now the opportunities for economist to get actively involved into this - study of Economics of Capital Market and Digital Economy and actively contribute to this emerging area. It will pave way for exploration of new thought and ideas in generating employment as well as getting to know about how the financial markets are functioning in this changing circumstances. This will make our student to become highly competitive in the financial market, labour market as well as in invention of new branch of knowledge.

UNIT-I

Capital Market - Definition - Growth - Tasks - Structure - Role of Commercial Banks.

UNIT-II

Short Term and Long Term Finance - Interest Free Financial Products and its sources - Financial Institutions - LIC - UTI - IDBI - IFCI - ICICI - Public Deposit - Corporate ploughing back of profits - Mutual Funds - open ended and close ended mutual funds.

UNIT-III

Corporate securities - Equity Shares - Preference Shares - Debentures and bonds - convertible and non-convertible debentures - fully and partly convertible debentures - Global depository receipts.

UNIT-IV

Stock exchanges - functions services - Listing of securities - Dealers in stock exchanges - Role of Securities and Exchange Board of India (SEBI) in regulating the share market - D-mat Account - Opening and Operation.

UNIT-V

Public Issue of Shares - Primary Market and Secondary Market - Issue of Shares at par and at premium - Right issue of shares - Issue of bonus shares - underwriting of shares - Merchant banks - Foreign Institutional Investors.

**BOOKS FOR
REFERENCE:**

1. Bukley : Multi National Finance, Prentice Hall, New Delhi
- David : Understanding Electronic Commerce, Microsoft Press,
2. Kosiur Prentice
Hall of India.
- Don
3. Tapscott : Growing up Digital, The Rise of the New Generation Oakton, Vs
United States.
- Don
4. Tapscott : Digital Capital : Harnessing The Power of Business Webs.
- Indian Tax
5. Foundation : Financial Sector Reforms in India, 1991-2001.
6. John, D Finnerty : Corporate Financial Analysis, McGraw Hill, Book Company,
ISBN 0-07-021040-3
- Baja
7. Kamalesh, K j & : E-commerce, The Cutting Edge of Business, TATA
McGraw Hill
Debjani Nag Publishing Limited Co., New Delhi.
8. Khan : Financial Services, TATA McGraw Hill Publishing Limited
Co.,
New Delhi
9. Khan & Jain : Corporation Finance, TATA MacGraw Hill.
- Kuchhal,
10. S.C. : Corporate Finance, Chaitinya Publishing House, University
Road, Allahabad.
11. Manual of SEBI : A Nabhi Publications, New Delhi.
12. Meir Kohn : Financial Institutions and Markets, TATA McGraw Hill
Publishing Limited Co., New Delhi.
13. Muddrick & Ross : Information System & Modern Management, Prentice Hall,
New Delhi
14. Raghunathan, V : Stock Exchange and Investment, TATA McGraw Hill Publishing
Limited Co., New Delhi.
Whinston Electronic Commerce, A Manager's Guide,
15. Ravi Kalakota & : Addition
Andrew, B Wesely, USA
16. Richad Pie & Bill : Corporate Finance & Investment, Prentice Hall, New Delhi.
Neale
17. Saeed, M : Corporate Financial Reporting, Anmol Publications, New Delhi.

SKILL BASED SUBJECT

PAPER - 3

HUMAN RESOURCE MANAGEMENT I

UNIT-I

Human Resource Management: Meaning - Objectives – Nature - Scope – Importance – Problems – Functions – Personnel Mgt v/s HRM . Qualities and Qualifications of Human Resource Managers.

UNIT-II

Human Resource Planning: Meaning – Need – Importance – Objectives – Process – Responsibility. Recruitment: Meaning – Factors Influencing Recruitment – Recruitment Policy – Problems – Sources of Recruitment. Selection: Meaning – Factors Affecting Selection Decisions
– Selection Policy – Steps in Selection – Techniques of Selection. Placement: Meaning and Principles. Placement policy. Induction: Meaning and Objectives.

UNIT-III

Human Resource Development: Training Meaning - Need and Importance – Objectives – Types – Steps in Training Programme – Organisation of Training Programmes – Methods of Training – Concept of Management Development Programmes – Essentials of Management Development Programmes. Career Development: benefits – career problems.

BOOKS FOR REFERENCE:

1. Aswathappa Human Resources and Personnel Management – Tata MC Graw Hill
2. John Storey Human Resource Management Rutledge.
3. R.D. Agarwal Dynamics of Personal Management in India.
4. Terry; L. Leap & M.D. Crino Personnel/Human Resource Management Macmillan
5. C.S. Venkataratnam Personal Management & Human & B.K. Srivastav Resources
Tata Mc. Graw Hill.

SEMESTER VI

PAPER - 13

MACRO ECONOMICS II

UNIT-I

Multiplier - importance and leakages of multiplier-investment and employment multiplier. Accelerator - Multiplier and accelerator interaction principle and modern approaches to business cycle theory.

UNIT-II

Money in the Keynesian model-Demand for money in the Keynesian Theory and Patinkin theory, objectives of Macro Economic Policy.

UNIT-III

General Equilibrium-IS and LM function-Keynes IS and LM, Hicks-Hansen analysis, and Pigou effect, Keynesian revolution and its application to Less Developed countries.

UNIT-IV

Inflation – types - Demand push vs Cost push inflation, causes and effects of inflation, Measures to control inflation, the Phillips Curve .

UNIT V

Monetary policy- role of monetary policy in developing economy - Fiscal policy – Monetary - Fiscal policy mix

PAPER - 14

FISCAL ECONOMICS II

UNIT-I

Budgeting and financial administration.

UNIT-II

Deficit financing - Meaning - Objectives - Role of deficit financing in Indian

UNIT-III

Objectives and instruments of fiscal policy in a developing economy with reference to India.

UNIT-IV

Federal Finance - Principles - Financial relations between the Centre and states in India - Brief review of earlier nine finance Commissions Details of X, XI, XII Finance Commissions and their recommendation. Centre-State conflict of finances.

UNIT-V

Local Finance - Sources of finance to local bodies. Planning for Development - Effect on prices, production and distribution.

PAPER - 15

HISTORY OF ECONOMIC THOUGHT

Objective

The Genesis and evolution of Economic Thought through the ages reveals social life of the people and their values in life. Understanding the Thought is a pre-requisite to understand the science of Economics and to analyse the principles, Doctrines, Laws and Policies.

UNIT-I

Nature and Significance of the History of Economic thought - a brief outline of Mercantilism and Physiocracy.

UNIT-II

Classical School - Adamsmith – Alfred Marshall, -Karlmarx

UNIT-III

Keynes and Keynesian Revolution; limitations.

UNIT-IV

Welfare Economics - Pigou - Hicks – Pareto - Noble Laureates Since 2000

UNIT-V

Indian Economic Thought R.C.Dutt; M.K.Gandhi; Dr.B.R.Ambedkar- Gadgil.

**BOOKS FOR
REFERENCE:**

1. Alexander Grey : Development of Economic Doctrines.
2. Ambedkar, B.R. : History of Indian Currency and Banking.
3. Ambedkar, B.R. : Problem of Rupee
4. Ambedkar, B.R. : Provincial Finance in British India.
5. Eric Roll : History of Economic Thought
6. Ganguli, B.W. : Indian Economic Thought
8. Haney, L.H. : History of Economic Thought
9. Hecksher, Eli : Mercantilism, Macmillan
General Theory of Employment, Interest and
10. Keynes, J.M. : Money.
11. Loganathan, V. : A History of Economic Thought
12. Newman, P.C. : Development of Economic Thought

ELECTIVE
(to choose 1 out of the given 4)

PAPER - 2

1. ENVIRONMENTAL ECONOMICS II

UNIT-I

Energy Economics : Energy Sources - renewable and non-renewable energy - sources of Energy - Changing pattern of world energy consumption - Energy scenario in India - Energy Policy and Environmental Quality.

UNIT-II

Resource Economics : Classification of Resources - Forest Resources - Deforestation - optimum resource use - conservation of natural resources - water resources - mineral resources - food resources.

UNIT-III

Environmental Education :Solid waste management - Human rights - value education - Environmental Awareness HIV / AIDS - Women and Child Welfare - Family Planning.

UNIT-IV

Measures to Protect Environment : i) (a) Regulation (or) Direct Control (b) Fiscal Tools - taxes - subsidies - pollution permits, (c) Definition of property rights, (d) Government Investment Programme (ii) Regulation vs. Tax - a comparison (iii) Environmental Legislation and Laws.

UNIT-V

Environmental Problems in the global set up - critical issues - Global Warming - Ozone Depletion - acid rain - soil erosion - rain water harvesting.

PAPER - 2

2. INTERNATIONAL TRADE II

UNIT-I

International Monetary System and Liquidity - IMF - IBRD, ADB, IFC, International Capital Flows - FDI, GATT and WTO - Functions; Uruguay Round and WTO Agreements - TRIPS and TRIMS GATS (General Agreement on Trade in service) UNCTAD, UNIDO, ITC

UNIT-II

Balance of payments and Balance of Trade - Concepts and structure - Disequilibrium - Causes and Measures to remove disequilibrium.

UNIT-III

Analysis of India's Foreign Trade - Growth trends - Composition and Direction.

UNIT-IV

India's BOP including invisibles - Assessment of prospects - Markets and products.

UNIT-V

Salient features of India's Export and Import Policies - Export Assistance Measures - Free trade Zones - State Trading in India, Indian Trade Agreements.

PAPER - 2

3. INDUSTRIAL ORGANISATION II

UNIT-I

Materials Management - Storing, Inventory, Inventory Control.

UNIT-II

Personnel Management - Personnel Planning and Selection - Human Resource Development - Personnel Problem - Compensation to employee, Worker's Participation in Management.

UNIT-III

Labour Legislation - Union and Management, Leadership, Morale, Communication.

UNIT-IV

Sales Management - Sales Policy, Planning Price Fixation, Advertising Salesmanship.

UNIT-V

Controlling - Budgetary Control - Reporting - Statistical reports.

PAPER - 2

4. ECONOMICS OF CAPITAL MARKET AND DIGITAL ECONOMY II

UNIT-I : Data Base Analysis

Emerging Cyber Economy - Opportunities and Challenges offered by internet - generic business models on the net - types and technology and economic changes.

UNIT-II : Intra Business Applications

Intra business applications: Online sales force automation, online customer service & support, virtual organization, logistics management.

UNIT-III : Marketing Through The Internet

Marketing through the internet: Advertising and marketing on the internet - Analysis of markets - Building of electronic market place of buyers and sellers, E-intermediaries, mercantile models Consumers and Merchants perspective. E-Commerce and retailing. case studies of products and services marketed on the Internet.

UNIT-IV: Electronic Payment Systems

Electronic payment systems and electronic cash E-Commerce and Banking. Internet monetary payment and security requirements - confidentiality of payment information, payment information integrity, Electronic payment, schemes - digital cash, credit cards, internet cheque, debit card, smart cards.

UNIT-V: Emerging Trends

Emerging Trends: Cyber communities - new communication paradigm, building infrastructure, gaining access, multi-sensory communications, mass markets / verticals / affinity groups, e-governance. Legal and regulatory issues, global learning infrastructure, computer based education and training, digital copyrights.

ELECTIVE
(to choose 1 out of the given 4)

PAPER - 3

1. LABOUR ECONOMICS

UNIT-I

Concept: Concept of Labour - Labour Economics and Labour problems - Factors responsible for labour problems - Characteristic features of Indian Labour.

UNIT-II

Collective Bargaining Power: Trade Union Movement in India - Meaning, Functions and role of trade Unions; Problems and Measures to strengthen T.U.

UNIT-III

Industrial Disputes: Forms of Disputes - Meaning and causes, prevention methods, Joint Management Council - Code of Discipline. Settlement of Disputes: Works Committee - Conciliation Officer - Board of Conciliation - Court of Enquiry - Labour Court - Industrial Tribunals.

UNIT-IV

Labour welfare: Labour Legislations: Social Security in India: Workmen's Compensation - Sickness Benefits Maternity Benefits - Retirement Benefits - ESI Act.

UNIT-V

National Commission on labour: Recommendations ILO purpose and functions - India and ILO

BOOKS FOR REFERENCE:

1. Abhyanker, N.G., : Industrial Labour and social Security
2. Agarwala, A.N., : Labour problems in India
3. Ahmed, Mukhtan : Trade Union and Labour Disputes in India.
4. Bhir, B.S : Dimensions of Industrial Relations in India.
5. Fonseca A.J. : Wage Determination and organised Labour in India.
6. Gadgil, D.R. : Regulation of wages and other Problems of Industrial Labour.
7. Giri , V.V. : Labour problems in Indian Industry.
8. Jain, P.C. : Industry and labour in India.
9. Joshi. N.M : Trade Union Movement in India
10. Karnik V.B., : Indian Labour Problems and prospects of Labour in India.
11. Malhotra, P.C : Labour Movement in India.
12. Mathur, A.S. & Mathur, J.S., : Trade Union Movement in India
13. Mehrotra S.N., : Labour Problems in India
14. Saxena, R.C. & : Labour problems and social welfare
15. Sharma, N.A. : Social Security
16. Subramaniam K.N., : Labour Management Relations in India
17. Sultan, P. : Labour Economics
18. Yoder, D. : Labour Economics and Labour Problems
19. Report of the Royal Commission on Labour - 1931
20. Report of the National Commission on Labour – 1969.

PAPER - 3
2. INSURANCE & ECONOMICS

UNIT-I

The quest for Economic Security - Classification of Risks - Demand for Insurance. Definition and Nature - Evolution and Importance of Insurance.

UNIT-II

Life Insurance Contract: Nature and Classification of Policies - Selection of Risk - Calculation of premium - Investment of Funds - Surrender Value.

UNIT-III

Fire Insurance : Nature and uses - Kinds of Policies - Policy Conditions - Rate Fixation - Payment of claim - Motor Insurance - Personal Accident - Health and Medical Insurance

UNIT-IV

Insurance in Economic Development : Insurance and Mobilisation of savings - Insurance Institutions as Investment Institutions and their role in capital market.

UNIT-V

Insurance as social welfare and security : Insurance - an Investment - Tax and Non - Tax Advantages - Retirement Planning - pension plans - Insurance Regulation and Development Authority (IRDA)

BOOKS FOR REFERENCE:

1. Mishra, M.N. : Insurance : Principles and Practice S.Chand & Co
2. -Do- : Modern Concepts of Insurance S. Chand & Co
2. Black K and : Life and Health Insurance Skipper H.D., Prentice Hall, New Jersey
3. Dionne & Harrington : Foundations of Insurance Economics - Kluwer Academic Publisher, Boston.
4. Insurance : General Insurance I.C. 340, Mumbai Institute of India.
5. IRDA : Insurance Regulations and Development Authority Regulations New Delhi.
6. Govt of India : Old age and Income Security Report (Dave Committee Report) Govt of India, New Delhi

PAPER - 3 Elements of Financial System

Objective: To help the students to know about the basic concepts of financial system.

Unit- I

Financial system – Meaning –Significance of the financial system –Relationship between Financial system and economic development.

Unit –II

Components of Financial system – Financial markets –Capital market – Importance of capital market – Primark market – Secondary market –Recent changes in Capital market .

Unit –III

Money market – Instruments dealt in Money market –Importance of Money market –Indian Money market – Causes for the low development of Indian Money market.

Unit – IV

Stock exchanges – Meaning – Functions - Performance of Stock exchanges- SEBI –Objectives – Functions of SEBI.

Unit – V

International Financial market –International Money market – International Capital market –Foreign exchange market – Meaning – Importance –Its role in economic development

PAPER - 3

4. ENERGY ECONOMICS

UNIT-I: Natural Resources

Classification & Importance of Energy Resources - Types and classification - Emergence of Energy Economics - Its nature & scope.

UNIT-II: Institutional Role of Energy

Development Role of Energy in Economic Development - Energy intensity and Elasticity - National and International Comparison - Role of Institutions like ONGC, OPEC, OAPEC, IEA and World Bank.

UNIT-III: Environment Energy Crisis

Energy Crisis: causes - Consequences and Remedial Measures - Environmental Crisis - Causes - Consequences - Impact of Energy consumption on production and on Environment.

UNIT-IV: Indian Energy Sector

Organisational structure - Energy Supply (Coal & Lignite, Oil & Gas, Hydro, Thermal, Nuclear) Energy Demand (From Agricultural, Industry, Transport, Domestic etc.,)

UNIT-V: Energy sources

Renewable (Solar, Wind, Tidal, Wave, Bio-gas, Biomass, Hydrogen etc)
Renewable Energy Programmes under 5 year plans - Energy issues and Policy options for India. Field visit - Project report

BOOKS FOR REFERENCE:

1. Agarwal, M.C., and Mongro, J.R. – Economic and Commercial Geography (National Publishing House, New Delhi 1992)
2. Agarwal, S.K. – Environment and Natural Resources Economics (Scott Foresman & Co., London 1985)
3. Common, M. Environmental and Resource Economics (Longman, London 1996)
4. David Pearce – Sustainable Development – Economics and Environment in the Third world (Earthscan Publications, London, 1990)
5. Deoffrey Kirk – Schemacher on Energy, Abacus, London 1982,
6. Government of India: Tenth Five year plan (Planning commission, New Delhi, 2002)
7. Hemalatha Rao – Rural Energy Crises : A Diagnostic Analysis (Ashish publishing House, New Delhi, 1990)
8. Karpagam, M Environmental economics (Sterling, New Delhi 1991)
9. Kneese. A.C. and Sweeney, J.L. Handbook of Natural resource and Energy Economics (North Holland, 1993)
10. Munasinghe, M and Meier P. Energy Policy and Modeling (Cambridge University press, UK 1993)
11. Paul Stevens (Ed) The economics of Energy, Vol 1 and II (Edward Elgar 2000)
12. Raikhy P.S. and Parminder Singh, Energy Consumption in India – Pattern and Determinants (Deep and Deep, New Delhi 1990)
13. Richard Eden – Energy Economics – Growth, Resources and Policies (Cambridge University Press, London 1981)
14. Sankar U, Public Sector pricing, Theory and Applications (IEA Trust for Research and Development 1992)
15. TERI – Teri Energy Data Directory and year Book 2005 – 2006 (The Energy Research Institute 2005)
16. William Burch (Ed.,) Readings in Ecology, Energy and human society: Contemporary Perspectives (Harper and Row, New York 1997)
17. World Bank – World Development Report 1992 (Oxford University Press, China, 1992)

SKILL BASED SUBJECT

PAPER - 4

HUMAN RESOURCE MANAGEMENT II

UNIT-I

Transfer: Objective – Policy – Types. Promotion: Purpose – Promotion Policy – demotion. Discipline: Meaning- Positive and Negative Aspects of Discipline- Causes of Indiscipline – Disciplinary Procedure – Maintaining Discipline.

UNIT-II

Performance Appraisal: Meaning – Need – Importance – Objectives – Problems – Factors Influencing Performance Appraisal – Responsibility –Techniques of Performance Appraisal – Traditional Techniques – Modern Techniques of Performance Appraisal.

UNIT-III

Compensation: Objectives – Principles – Factors Influencing Wage and Salary – Executive Compensation plans – Benefits and Employee Services – Fringe Benefits. Motivation: Meaning – Features – Techniques – Importance – Theories of Motivation.

THIRUVALLUVAR UNIVERSITY**BACHELOR OF ARTS****B.A. HISTORY****DEGREE COURSE****CBCS PATTERN****(With effect from 2017-2018)****The Course of Study and the Scheme of Examinations**

| S. No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|------------------|---------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 5 | 3 | History of India up to A.D.1206 | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper-2 | 5 | 3 | History of India from A.D.1206 to A.D.1707 | 25 | 75 | 100 |
| 5 | III | ALLIED -1 | Paper-1 | 6 | 4 | (to choose any 1 out of 4) A. Outlines of Political Theory I B. Studies on States and Governments I C. Principles of Public Administration I D. Principles of Sociology I | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 6 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-3 | 4 | 3 | History of India from A.D.1707 to A.D.1885 | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-4 | 4 | 3 | History of India from A.D.1885 to A.D.1947 | 25 | 75 | 100 |
| 11 | III | ALLIED-1 | Paper-2 | 6 | 6 | (to choose any 1 out of 4) A. Outlines of Political Theory II B. Studies on States and Governments II C. Principles of Public Administration II D. Principles of Sociology II | 25 | 75 | 100 |

B.A. History: Syllabus (CBCS)

| S. No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------|---------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft skill | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-5 | 3 | 3 | History of India from A.D.1947 to A.D.2014 | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-6 | 4 | 3 | History of Tamil Nadu upto A.D.1336 | 25 | 75 | 100 |
| 18 | III | ALLIED-2 | Paper-3 | 6 | 4 | (to choose 1 out of 4) A. Tourism I B. Indian Economy I C. Media Studies I D. Journalism I | 25 | 75 | 100 |
| 19 | IV | Skill based Subject | Paper-1 | 3 | 3 | Cultural Heritage of Tamil Nadu | 25 | 75 | 100 |
| 20 | IV | Non-major elective | Paper-1 | 2 | 2 | (to choose 1 out of 2) A. Fundamentals of Defence and Strategic Studies B. National Movement in India | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 21 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-7 | 3 | 3 | History of Tamil Nadu from A.D.1336 to A.D.1806 | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper-8 | 4 | 3 | History of Tamil Nadu from A.D.1806 to A.D.2011 | 25 | 75 | 100 |
| 25 | III | ALLIED-2 | Paper-4 | 6 | 6 | (to choose 1 out of 4) A. Tourism II B. Indian Economy II C. Media Studies II D. Journalism II | 25 | 75 | 100 |
| 26 | IV | Skill based Subject | Paper-2 | 3 | 3 | Human Rights Education | 25 | 75 | 100 |
| 27 | IV | Non-major elective | Paper-2 | 2 | 2 | (to choose 1 out of 2) A. Fundamentals Of National Security B. Indian Constitution | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |

B.A. History: Syllabus (CBCS)

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|---------------------|----------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER V | | | | | | | | | |
| 28 | III | Core Theory | Paper-9 | 6 | 5 | History of Europe from A.D.1453 to A.D.1789 | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-10 | 6 | 5 | History of USA from A.D.1861 to A.D.1932 | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper-11 | 6 | 5 | History of China and Japan from A.D.1900 to A.D.2000 | 25 | 75 | 100 |
| 31 | III | Theory | Paper-12 | 5 | 5 | Constitutional History of India from A.D.1773 to A.D.1950 | 25 | 75 | 100 |
| 32 | III | Elective | Paper-1 | 4 | 3 | (to choose 1 out of 3) A. History of freedom movement in Tamil Nadu from A.D.1800 to A.D.1947 B. Women Development in Tamil Nadu from A.D.1900 to A.D.2000 C. Archaeology I | 25 | 75 | 100 |
| 33 | IV | Skill based Subject | Paper-3 | 3 | 3 | Intellectual History of Tamil Nadu from A.D.1700 to A.D.2000 | 25 | 75 | 100 |
| | | | | 30 | 26 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | | | |
| 34 | III | Core Theory | Paper-13 | 6 | 5 | History of Europe from A.D.1789 to A.D.1945 | 25 | 75 | 100 |
| 35 | III | Core Theory | Paper-14 | 6 | 4 | History of USA from A.D. 1932 to A.D.2000 | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper-15 | 6 | 4 | International Relations Since A.D.1945 | 25 | 75 | 100 |
| 37 | III | Elective | Paper-2 | 5 | 3 | (to choose 1 out of 4) A. History of Science and Technology in India upto A.D.1900 B. Dravidian Movement in Tamil Nadu upto A.D.1947 C. History of the Arabs from A.D. 750 to A.D.1258 D. History of RUSSA from Early times to A.D.1917 | 25 | 75 | 100 |
| 38 | III | Elective | Paper-3 | 4 | 3 | (to choose 1 out of 4) A. History of Science and Technology Since A.D.1900. B. Dravidian Movement in Tamil Nadu Since A.D.1947 C. An introduction to Museology D.Archaeology II | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------|------|----------------------|---------|----------------|--------|--|---------------|-----|-----|
| | | Course Title | | | | | | | |
| 39 | IV | Skill based Subject | Paper-4 | 3 | 3 | Growth of Panchayat institutions in Tamil Nadu | 25 | 75 | 100 |
| 40 | V | Extension Activities | | 0 | 1 | | 100 | 0 | 100 |
| | | TOTAL | | 30 | 23 | | 250 | 450 | 700 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 15 | (3-7) | 57 | 100 | 1500 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

SEMESTER I
PAPER - 1
HISTORY OF INDIA UPTO A.D.1206

UNIT-I

Geography of India – Sources – The pre –Historic people - The Indus Civilisation – The Aryans - The Vedic literature – Rig Vedic India - Later Vedic Civilization – Age of Sutras – The Epic Age – Origin of Caste System.

UNIT-II

Jainism - Buddhism – Condition of Northern India from 6th to 4th century B.C. – The rise of Magadha – India and Persia Alexander's invasion of India

UNIT-III

Chandragupta and Bindusara - Ashoka - Mauryan administration and Art – The Sungas and Kanvas – The satavahanas or Andhras the Bactrian Breeds, Sakas and pahlavas.

UNIT-IV

Rise and fall of Kushana Empire – The Nagas – The Gupta empire – The Vakatakas – Harsha varadha and his times – Northern India after Harsha – The Rashtrakuta Empire- The Chalukyas – Greater India.

UNIT-V

Arab invasion of Sind – India on the eve of Muslim conquest – Rise and fall of the Ghaznavids - Mohammad of Ghur.

MAPS:

1. Sites of Indus civilization
2. Alexander's invasion - route
3. Asoka's empire
4. Kanishka's empire
5. Samudra Gupta's empire
6. Harsha's empire

- | | | |
|----|---|--|
| 1. | V.Sathiyanaatha Iyer | : History of India, Vol-I: S.Viswanathan (PVT.) Ltd., 1975, Madras. |
| 2. | V.D. Mahajan | : Ancient India, S. Chand & Co., 1981, New Delhi. |
| 3. | Dr.B.P. Saha & Dr.K.S.Behra | : Ancient History of India, Vikas Publishing house, 1994, New Delhi. |
| 4. | R.C. Majumdar, H.C. Roy Chaudhri, K. Datta | : An advance history of india, Mac Millan India Ltd., 2004, New Delhi. |
| 5. | D.N.Thakur | : Ancient India, Manohar publishers, 2004, New Delhi. |

SEMESTER I

PAPER - 2

HISTORY OF INDIA FROM A.D.1206 TO A.D.1707

UNIT-I

The Mameluk Sultans of Delhi – Slave Dynasty – Qutb-ud-din Aibek and Aram Shah – Sultan Ilt-ut-mish and his successors Ghiyas-ud-din Balban and his successors – The Khilji dynasty – Jalal-ud-din Firozshah Khilji – Ala-ud-din Khilji – Qutb-ud-din Mubarak Khilji – Downfall of the Khilji Empire.

UNIT-II

Tughluq Dynasty: Ghiyas-ud-din Tughluq shah – Muhammad –Bin-Tughluq Firoz Shah Tughluq and his successors – Downfall of the Tughluq Dynasty – The Sayyid sultans of Delhi – The Lodi sultans of Delhi

UNIT-III

Administration of the sultanate – Culture and civilisation during the period of the sultanate – Mongol invasion – The north-west frontier policy of the sultans of Delhi – The provincial kingdoms – The Bahmini kingdom – Vijaya Nagara empire.

UNIT-IV

The Mughal – Afghan contest and the establishment of the mughal empire: India on the eve of Babur invasion – Babur – Humayun – Shershah and his successors – The Extension of the Mughal empire – Akbur the great – Jahangir.

UNIT-V

Shahjahan – Aurangzeb – Mughal Administration, Culture and Civilisation – The rise of Marathas: Chatrapati Shivaji – The rise of Sikkism

MAPS:

1. Ala-ud-din Khilji's Empire
2. Malik Kafur's Southern Expedition
3. Mohammed-bin Tughulq's Empire
4. Vijaya nagar empire under Krishnadeva Rayar
5. Mughal Empire under Akbar
6. Mughal Empire under Aurangazeb

Reference Books:

1. R.C. Majumdar, H.C. Roychaudri & K. Datta : An Advanced History of India, Mac Millan India Ltd., 2004, New Delhi.
2. S.R. Sharma : The Crescent in India Lakshmi Narain Agarwal, 1983, New Delhi.
3. L.P. Sharma : History of Medieval India, Konark Publishers Pvt. Ltd, 1997, New Delhi.
4. J.L. Mehta : Advanced Study in the History of Medieval India Sterling Publishers Pvt. Ltd., 1983, New Delhi.

SEMESTER I

PAPER - 1

ALLIED-1

A. OUTLINES OF POLITICAL THEORY – I

UNIT – I:

Nature, scope and importance of Political Science – Approaches – Methodology – Political Science and other Social Sciences.

UNIT – II:

State: Nature and Elements – State and Government – State and Society – State and associations – State, Nation and Nationality.

UNIT – III:

Theories of State: Divine Right theory – Theory of Force – Patriarchal theory – Matriarchal theory – Evolutionary theory – Social Contract theory.

UNIT – IV:

Sovereignty: Meaning and Nature – Characteristics of Sovereignty – Kinds of Sovereignty - Austin's theory of sovereignty – Pluralistic theory of sovereignty.

UNIT – V:

Citizenship - Rights - Duties – Liberty – equality – Justice – Law.

Reference Books:

1. Eddy Asirvatham & K.K. Mishra, Political Theory. New Delhi: S. Chand & Company Co. 2004.
2. Vidya Dhar Mahajan, Political Theory: Principles of Political Science. New Delhi: S. Chand & Company. 2013.
3. A.C. Kapur, Principles of Political Science. New Delhi: S. Chand & Co. 2005.
4. R.C. Agarwal, Political Theory: Principles of Political Science. New Delhi: S. Chand & Company Ltd. 2002.
5. B.C. Rout, Political Theories: Concepts and Ideologies. New Delhi: S. Chand & Company (Pvt.)Ltd. 1987.
6. Amal Roy and Mohit Bhattacharya: Political Theory: Ideas and Institutions, Calcutta: The World Press, 2002.
7. J.C. Johari, Modern Constitutions, New Delhi: S. Chand & Co. 1990.

SEMESTER I

PAPER - 1

ALLIED-1

B. STUDIES ON STATES AND GOVERNMENTS - I

UNIT- I: STATE

1. Classification of States
2. Aristotlian Classification
3. Merits and Demerits of Unitary and Federal States
4. Problems of Federal Government

UNIT-II: CONSTITUTION

1. Definition of Constitution
2. Framework of Government
3. Rights of the people
4. Duties of the people
5. Classification of Constitutions

UNIT- III: THEORY OF SEPARATION OF POWERS

1. Montesquieu's views on separation of powers
2. Its application in the American and British context

UNIT-IV: SUFFRAGE

1. Meaning of suffrage
2. Types of Constituency
3. Duty of representatives
4. Representation of minorities
5. Electorate

UNIT-V: POLITICAL PARTIES

1. Classification of Political parties
2. Role of Political parties
3. Defects of Political parties
4. Interest and Pressure Groups

Reference Books:

1. Amal Roy and Mohit Bhattacharya : Political Theory: Ideas and Institutions, The World Press, Calcutta, 2002.
2. A. Appadurai: Substance of Politics: Oxford University Press, New Delhi, 1990.
3. C.F.Strong: Modern Political Constitutions, Sidgwick & Jackson Limited, London, 1973.

SEMESTER I

PAPER - 1

ALLIED-1

C. PRINCIPLES OF PUBLIC ADMINISTRATION – I

Unit –I :

Nature, Scope and importance of Public Administration – Public Administration and other Social Sciences – Public Administration Vs Private Administration – New dimensions.

Unit – II:

Organization Theories: Classical theory – Human Relations Theory – Systems theory – Principles of Organizations: Hierarchy – Span of control – Unity of Command – Centralization and Decentralization.

Unit – III:

Structure of Organizations: Chief Executive – Line, Staff and Auxiliary agencies – Departments – Public Corporations – Independent Regulatory Commissions.

Unit – IV:

Personal Administration: Recruitment - Training – Promotion – Retirement – Associations and Unions.

Unit – V:

Financial Administration: Budget – Types – Principles – Enactment of Budget Parliamentary Control over finances: Accounting and Audit – Financial Committees.

Reference Books:

1. Vishnoo Bhagwan, Vidya Bhushan and Vandana Mohla, Public Administration, New Delhi: S.Chand & Co.,2012.
2. J.K. Chopra, Public Administration, Delhi. Unique Publishers (I) Pvt. Ltd., 2013.
3. A.R.Tyagi, Principles of Public Administration. Atmaram & Co., New Delhi. 1990.
4. Avasthi and Maheswari, Principles of Public Administration, Lakshmi Narain Agarwal, Agra, 2002.
5. S.R. Maheswari, Indian Administration, New Delhi: Orient Longman, 2006.
6. Arora and Rajni Goyal, Indian Administration, New Delhi: Wishwa Prakashan, 2006.

SEMESTER I

PAPER - 2

ALLIED-1

D. PRINCIPLES OF SOCIOLOGY I

UNIT-I

The Science of Sociology - Definition - Nature and scope - Sociology as a Science - Its importance and relations to other Social Sciences.

UNIT-II

Basic Concepts of Sociology: Society - Community - Institution - Association - Social Group - Status and Role.

UNIT-III

Social group - Definition - Characteristics - Types and Functions.

UNIT-IV

Culture - Definition - Characteristics - Elements - Functions - Cultural Lag - Ethnocentrism - Culture and Civilization - Cultural Uniformity and Variability.

UNIT-V

Social Institutions: Marriage - Family - Religion Education - Economy - Government - Nature and Functions.

Reference Books:

1. Inkeles Alex. What is Sociology? An Introduction to the Discipline and Profession, Englewood Cliffs: N.J. Prentice Hall, 1964.
2. Giddens, Anthony. Sociology, Cambridge: Polity, 2001.
3. Horton, B and Hunt, L. Sociology, New York: McGraw Hill Book Cp., 1984.
4. Johnson, Harry, M. Sociology: A Systematic Introduction, New Delhi: Allied Publishers, 1993.
5. Smelser, N.J. Sociology, New Delhi: Prentice Hall of India Ltd., 1993.

SEMESTER II

PAPER - 3

HISTORY OF INDIA FROM A.D.1707 TO A.D.1885

UNIT-I

Later Mughals – Peshwas and their administration Coming of the Europeans – Portuguese – Dutch – French – English – Danish occupation.

UNIT-II

Anglo - French rivalry - Carnatic wars - Battle of Plassey – Third Battle of Panipat – Battle of Buxar – Anglo – Mysore wars – Anglo- Maratha wars – Anglo-Burmese wars – Anglo – Afghan wars – Anglo – Sikh wars.

UNIT-III

Rise of British Power: Administrative reforms of Robert Clive, Warren Hastings, Cornwallis, Wellesley, Lord Minto, Lord Hastings, William Bentinck, Lord Dalhousie, Canning, Lytton and Lord Ripon.

UNIT-IV

Socio – Religious reform movements – Brahmo samaj, Prarthana samaj, Arya samaj, Ramakrishna mission and Theosophical society – 1857 revolt – causes – course and impact – factors leading to the formation of Indian National Congress.

UNIT-V

Constitutional development from 1773 to 1861: Regulations Act, Pitt's India Act, Charter Acts of 1793, 1813, 1833, 1853 - Queen's Proclamation –Government of India Act of 1858, Act of 1861.

MAPS:

1. Portuguese settlements in India
2. Early English factories
3. British India under Warren Hastings
4. British India under Wellesley
5. British India under Dalhousie.
6. Places connected with the event of 1857.

Reference Books:

1. Roy Chaudhry. S.C. : History of Modern India, Surjeet Publications, 2006, New Delhi.
2. Mahajan, V.D. : India since 1526. S. Chand & Co., Pvt. Ltd, 1984. New Delhi - 55
3. Agarwal, R.C.: Constitutional Development and National Movement of India. S. Chand & Co., Pvt., Ltd, 1988 New Delhi.
4. Sathianathan: History of India - Vol. - III S. Viswanathan, Printers and Publishers, 1999, Chennai.
5. Anup Chand Kapur : Constitutional History of India, Niraj Prakashan, 1970, New Delhi.
6. Grover, B.L & Grover. S. : A New outlook on Modern Indian History, S. Chand & Co., Pvt. Ltd, New Delhi - 55, 2005.

SEMESTER – II
PAPER – 4
HISTORY OF INDIA FROM A.D.1885 TO A.D.1947

UNIT- I

Factors for the growth of Nationalism - Formation of INC - Programmes and activities up to 1905 - Indian Councils Act of 1892.

UNIT- II:

Administration of Lord Curzon - Swadeshi Movement - Formation of Muslim League - Surat split - Extremist activities - Minto-Morley reforms of 1909.

UNIT- III:

First World War and its effects - Lucknow Pact - Home Rule Movement - Emergence of Gandhi - Rowlett Act - Jallianwala Bagh massacre - Montague – Chelmsford Reforms of 1919.

UNIT- IV:

Gandhian Era - Non-Cooperation Movement - Swaraj Party - Simon Commission - Nehru Report - Jinnah's 14 points - Civil Disobedience Movement - Round Table Conferences - Government of India Act of 1935.

UNIT-V:

Second World War and its effects - Two Nation Theory of Jinnah - Quit India Movement - Cabinet Mission - Mountbatten Plan - Partition and Independence.

Reference Books:

1. I. Groover, B., and Grover. S. - A New Look at Modern Indian History, New Delhi: S. Chand & Co., 2004.
2. Majumdar, R.e. and Others - An Advanced History of India, New Delhi, Macmillan, 2003.
3. Larry Collins and Dominique Lapierre - Freedom at Midnight, Delhi: Vikas publications, 1996.
4. Sumit Sarkar - Modern India, (1885 - 1947), New Delhi: Macmillan, 2001.
5. Bipan Chandra and Others - India's Struggle for Independence, New Delhi, Penguin, 2008.
6. 6. Agarwal R.C. - Constitutional Development and National Movement of India, New Delhi: S. Chand & Co., 2005.
7. Venkatesan, G. History of Freedom Struggle in India, Madurai: J.J. Publications, 1999.

SEMESTER II

ALLIED - 1

PAPER - 2

A. OUTLINES OF POLITICAL THEORY – II

UNIT – I:

Constitution: Meaning and Nature – Essentials of a Good Constitution – Written and Unwritten Constitutions – Rigid and Flexible Constitutions – Merits and Demerits.

UNIT – II:

Legislature: Adult suffrage –Organisation of Legislature: Unicameral system and Bi-cameral system – composition of lower house and upper houses – powers of the two houses – Direct Legislation.

UNIT – III:

Executive: Types of Executive: Parliamentary Executive – Presidential Executive – Plural Executive – Functions.

UNIT – IV:

Judiciary: Importance, functions and independence of the judiciary – Rule of Law – Administrative Law – relations between Legislature, Executive and Judiciary.

UNIT – V:

Political Participation: Political parties – pressure groups – public opinion.- Mass Media – Electronic Media.

Reference Books:

1. Eddy Asirvatham & K.K. Mishra, Political Theory. New Delhi: S. Chand & Company Co. 2004.
2. Vidya Dhar Mahajan, Political Theory: Principles of Political Science. New Delhi: S. Chand & Company. 2013.
3. A.C. Kapur, Principles of Political Science. New Delhi: S. Chand & Co.2005.
4. B.C. Rout, Political Theories: Concepts and Ideologies. New Delhi: S. Chand & Company (Pvt.)Ltd. 1987.
5. Amal Roy and Mohit Bhattacharya: Political Theory: Ideas and Institutions, Calcutta: The World Press, 2002.
6. J.C. Johari, Modern Constitutions, New Delhi: S. Chand & Co. 1990.

SEMESTER II

ALLIED - 1

PAPER - 2

B. STUDIES ON STATES AND GOVERNMENTS - II

UNIT-I: INTRODUCTION

1. Philosophical foundations of the Indian Constitution
2. Salient Features of the Indian Constitution
3. Preamble of the Indian Constitution
4. Citizenship In India
5. Constitutional Amendment in India

UNIT-II: FUNDAMENTAL RIGHTS AND DIRECTIVE PRINCIPLES OF STATE POLICY

1. Nature and Scope of Fundamental Rights
2. Nature and Scope of Directive Principles of State Policy

UNIT-III: UNION GOVERNMENT

1. The President
2. The Vice-President
3. The Prime Minister, Cabinet and Council of Ministers.
4. Lok Sabha and Rajya Sabha
5. Supreme Court of India.
6. Centre-State Relations

UNIT-IV: STATE GOVERNMENT

1. The Governor
2. The Chief Minister, Cabinet and the Council of Ministers
3. Legislative Assembly
4. Legislative Councils
5. High Courts

UNIT-V: LOCAL GOVERNMENT

1. Urban Local Government

Corporations

Municipalities

Townships

Cantonments

Mayor

74th Constitutional Amendment

2. Rural Government

Balvanth Rai Metha and Ashok Metha Committees

District Panchayat

Panchayat Samiti

Village Panchayat

District Collector

73rd Constitutional Amendment

Reference Books:

1. U.R Ghai: Indian Political System, Academic Publishing House, Jalandhar, 2000.
2. Harihara Das: Political System of India, Anmol Publications, New Delhi, 2000.
3. Kishore Sharma: Introduction to the Constitution of India, Prentice Hall of India, New Delhi, 2005.
4. S.R.Maheswari: Local Government in India, Lakshmi Narain Aggrawal, Meerut, 2005
5. J.R.Siwach: Dynamics of Indian Government and Politics, Sterling Publications, New Delhi 2005.
6. D.D.Basu: Introduction To Indian Constitution, Prentice Hall, New Delhi, 2005.

SEMESTER II

ALLIED - 1

PAPER - 2

C. PRINCIPLES OF PUBLIC ADMINISTRATION – II

Unit- I:

Evolution of Indian Administration: Kautilya's Administration – Mughal Administration – British Administration – Indianisation of Public Services - Features of the Indian Constitution.

Unit – II:

Union Government and Administration: President – Executive – Parliament – Judiciary – Cabinet Secretariat – Prime Minister's Office - Central Secretariat – Ministries and Departments.

Unit – III:

State Government and Administration: Union – State administrative, Legislative and Financial relations - Governor – Chief Minister and Council of Ministers – Chief Secretary – State Secretariat – Directorates.

Unit – IV:

District Administration and Local Government: Changing role of District Collector – Union, State and local relations -Municipalities – Panchayati Raj institutions.

Unit –V:

Civil services: All India Services – Central Services – State Services: Public Service Commissions: Union Public Service Commission – State Public Service Commissions – Staff Associations – Grievance redressal mechanism.

Reference Books:

1. Vishnoo Bhagwan, Vidya Bhushan and Vandana Mohla, Public Administration, New Delhi:S.Chand & Co.,2012.
2. J.K. Chopra, Public Administration, Delhi. Unique Publishers (I) Pvt. Ltd., 2013.
3. A.R.Tyagi, Principles of Public Administration. Atmaram & Co., New Delhi. 1990.
4. Avasthi and Maheswari, Principles of Public Administration, Lakshmi Narain Agarwal, Agra, 2002.
5. S.R. Maheswari, Indian Administration, New Delhi: Orient Longman, 2006.
6. Arora and Rajni Goyal, Indian Administration, New Delhi: Wishwa Prakashan, 2006.

SEMESTER II

ALLIED - 1

PAPER - 2

D. PRINCIPLES OF SOCIOLOGY II

UNIT-I

Individual in / and Society - Heredity and Environment - Socialization - Agencies of Socialization - Importance of Socialization.

UNIT-II

Social Processes - Meaning - Types of Social Processes - Associative and Dissociative Social Processes.

UNIT-III

Social Control - Meaning, Nature and Need of Social Control - Types of Social Control - Formal and informal.

UNIT-IV

Social Stratification and Mobility : Meaning, Forms and Functions of Social Stratification.

UNIT-V

Social Change - Meaning - Factors of Social Change - Social Evolution, social Progress, Modernization - Development.

Reference Books:

1. Bottomore, T.B. Sociology A Guide to Problems and Literature, New Delhi: Blakie and Sons (India) Ltd., 1979.
2. Shankar Rao, C.N. Sociology, New Delhi: S. Chand and Company Ltd., 1997.
3. Goode, W.J. Principles of Sociology, New Delhi: Tata McGraw Hill Publishing Co., Ltd. 1977.
4. Giddens, Anthony. Sociology, Cambridge, Polity, 2001.
5. Caplow, Theodore. Sociology, New Jersey, Prentice Hall, 1971.

SEMESTER III

PAPER - 5

HISTORY OF INDIA FROM A.D.1947 TO A.D.2014

UNIT-I:

Nehru Era - Making of the Constitution - Integration and States reorganisation – Five Year Plans - Foundation of India's Foreign Policy - Kashmir issue - Chinese aggression of 1962.

UNIT-II:

Lal Bahadur Shastri - Domestic policy - Indo-Pakistan war of 1965 and Tashkent Accord - Indira Gandhi: 1966-1975 - Internal reforms - Congress split - Indo-Soviet Treaty of Friendship - Indo-Pakistan war of 1971 and the Simla Agreement.

UNIT-III:

Jayaprakash Narayan and Total Revolution - Emergency - Janata Government - Internal reforms and Foreign policy - Re-emergence of Indira Gandhi - Khalistan issue and Operation Blue Star.

UNIT-IV:

Rajiv Gandhi - Programmes and Policies - SAARC - Rajiv - Jayewardene Accord - V.P. Singh and National Front Government - P.V. Narashima Rao - New Economic Policy- Ayodhya issue.

UNIT-V:

UF, NDA and UPA coalition governments - Changing trends in Economy, Education, Science and Technology - Foreign policy.

Reference Books:

1. Dutt, V.P. - India's Foreign Policy, New Delhi: Vikas Publications, 1993.
2. Grover, B.L., and Grover, S. A New Look at Modern Indian History, New Delhi: S. Chand & Co., 2004.
3. Mahajan, V.D., History of Modern India (1919 - 1982), New Delhi: Chand & Co. 2004.
4. Ramachandra Guha, India After Gandhi, Noida: Picador, 2008.
5. Christophe Jaffrelot, India Since 1950, New Delhi: Yatra Books, 2012.
6. Bipan Chandra, Mridula Mukherjee and Aditya Mukherjee - India after Independence, New Delhi, Penguin, 2008.
7. Venkatesan, G. History of Contemporary India, Rajapalayam: V.c. Publications, 2010.

SEMESTER III
PAPER - 6
HISTORY OF TAMIL NADU UPTO A.D. 1336

Unit – I

Geography and its impact on the History of Tamil Nadu – sources – Sangam Age- Chera, Chola and Pandyas – Political, Economic and Social conditions- Sangam Literature. Sangam Feudatories.

Unit – II

Kalabhra Interregnum – Pallavas – Sources – Origin – Early pallavas – Later pallavas of Kanchi – pallava – Chalukya, Pallava – Pandya and Pallava – Rashtrakuta Relations – Administration – Economic and Social Life – Art and Architecture – Education – Literature – Bhakti cult.

Unit – III

The Age of the Cholas – Sources – Imperial Cholas – Chalukya, Cholas – Chola- Chalukya, Chola-Pandya and Chola – Rashtrakuta Relations- Administration – Economic and Social life – Art and Architecture – Education – Literature.

Unit – IV

Pandyas of Madurai – First and Second Pandyan Empires- Marcopolo – Relation with Cholas – Hoysala and Rashtrakuta interference in Tamil Nadu – Economic and Social conditions – Art and Architecture.

Unit – V

Muslim invasions – Conditions of south on the eve of invasion – Malik Kafur – Kusrukhan – Muhammad-bin-Tuglaq – Sultanate of Madurai – Impacts of Muslim invasions on Tamil Nadu.

Reference Books :

1. Cithra Madhavan, **History and culture of Tamil Nadu**, Vol.I, D.K. print world (P) Ltd., New Delhi, 2005.
2. Gopalan,R., **Pallavas of Kanchi**, university of Madras, Madras, 1928.
3. Gurumurthy,S., **Education in South India**, New Era Publications, Madras, 1979.
4. Kanagasabai Pillai, K., **Tamils 800 years Ago**, Saiva Siddhanta Publishing Society, Madras, 1904.
5. Krishnaswami,A., **Topics in South Indian History**, Annamalai Nagar, 1978.
6. Meenakshi,C., **Administration and Social Life under the Pallavas**,

- University of Madras, Madras, 1977.
7. Nilakanta Sastri, K.A., **The Colas**, University of Madras, Madras, 1935.,
1972. **The Pandyan Kingdom**, Swathi Publicatons, Madras,
 8. Noboro Karashima, **South Indian History and Society**, Oxford University Press, Madras, 1984. **A concise History of South India – Issue and Interpretations**, Oxford University Press, Chennai, 2014.
 9. Pillai, K.K., **Tamilaga Varalarum Panpadum** (Tamil), International Institute of Tamil Studies, Chennai – 2002.
 10. Rajamanickkam, M. **Pallavar Varalaru (Tamil)**, South Indian Saiva Siddanta Book Publishing Society, Trinelveili, 1999.
 11. Raman, K.V., **Pandiyar Varalaru** (Tamil), Tamil Nadu, Text Book Society, Madras, 1977.
 12. Sadasivapandarathar, T.V., **Pirkala Cholar Varalaru** (Tamil), Annamalai University, 1949.
 13. Srinivasa Iyengar, P.T., **History of the Tamils**, Asian Educational Services, New Delhi, 1983.
 14. Subramanian, N., **Socio-Cultural History of Tamil Nadu**, Ennes Publications, Udumalpet, 1999.
 15. Vekataramanayya, N., **Early Muslim Expansion in South India.**, Annamalai University, 1943.
 16. Thinakaran (Mrs), A.J., **The second Pandyan empire**, Priya Printer, Coimbatore, 1987.

SEMESTER III
ALLIED - 2
PAPER -3
A. TOURISM I

Unit - I:

Definition of Tourism –History of Travel and Tourism through the Ages-Basic concepts in Tourism-Domestic and Inter National.

Unit - II:

Basic components of Tourism- Scope -Impact of Tourism on Socio, Economic, Cultural and Environment.

Unit - III:

Tourist resources in India with special reference to Tamil nadu -Art, Architecture, Monuments, Sculptures, Fairs and Festivals.

Unit - IV:

Religious resources in India with special reference to Tamil Nadu. Places of Pilgrimage- Hindu, muslim, Buddhism, Christian and Jain.

Unit - V :

Tourism Administration of India-Ministry of Tourism-State Tourism Department-Accommodation -public, State and Private Agencies- ITDC , TTDC.

Reference Books:

1. A.K. Bhatia; Tourism development principles and practices; Sterling publishers (P) Ltd., New Delhi.
2. Anand, M.M.; Tourism and hotel industry in India; Sterling Publishers (P) Ltd., New Delhi.
3. Acharya Ram; Tourism and Cultural Heritage of India; ROSA Publications, Jaipur.
4. R.K. Sinha; Travel and Tourism Management; Dominant Publishers; New Delhi.
5. Ramila Chawla; Travel and Tourism Management - Dominant Publishers, New Delhi.
6. Prem Seth; Successful Tourism Management - Fundamental of Tourism; Sterling Publishers (P) Ltd., NewDelhi.
7. Nirmal Kumar; Tourism and Economic Development; APLL Publishing Corporation; New Delhi.

References:

1. K.K. Sharma; Tourism and Culture; Sarup and Sons Publishers; New Delhi.
2. A.K. Bhatia; International Tourism Management; Sterling Publishers (P) Ltd., New Delhi.
3. Ratandeep Singh; Infrastructure of Tourism in India; Kanishka Publishers, New Delhi.
3. Arun Kumar Sarkar; Action of Plan and Priorities in Tourism Development; Kanishka Publishers; New Delhi.
4. Dr.B.R. Kishore; India - A Travel Guide; Diamond Pocket Books (P) Ltd., New Delhi.
5. P.C. Sinha; Tourism Evolution Scope, Nature and Organization; Anmol Publications Pvt. Ltd., New Delhi.

SEMESTER III
ALLIED - 2
PAPER -3
B. INDIAN ECONOMY I

Objective

To enable the students to understand the salient features of India and her occupational structure; to assess the relative share of Agriculture, industry and service sector in the economy and to analyse the fruits of planning.

UNIT-I

Meaning and Characteristics of underdevelopment - salient features of Indian Economy - factors responsible for development - development as distinct from growth - a comparison between Indian and other developing economies like China, Pakistan, Taiwan, and Korea.

UNIT-II

Planning in India - meaning, process and approaches. Five Year Plans - Objectives in general and targets and performance.

UNIT-III

Agricultural role in Indian Economy (Contribution to GNP, employment, etc.,) Problems of low productivity - Land Reforms - need and scope. The food problem and Green Revolution; Mechanisation - desirability and feasibility.

UNIT-IV

Agricultural Marketing - Regulated Markets - warehousing - Role of Agricultural Prices commission (APC) - Procurement Policy - Buffer - Stock - Dual Pricing - Role of FCI. Agricultural Credit : Need and Sources.

UNIT-V

Industry and Its importance - Role of Small Scale Industry - some large scale industries (Iron & Steel, Cotton, Textiles, Sugar, Jute, Petro-chemicals, Tea, etc.,) Industrial Sickness - causes and measures; Industrial Policy Resolutions (1956, 1985 & 1991)

Reference Books:

1. 1.Agarwal, A.N. Indian Economy, Vikas Publishing house , New Delhi.
2. 2.Dewett, Verma & Sharma: Indian Economics, S Chand & Co., New Delhi.
3. Jhingan . M.L.:Economics of development and planning, Konark publishers, New Delhi.
4. 4.Kindle berger : Economic Development, to the Mohammad conquest, Oxford University press, London.
5. Kanka, S.S: Human Resource Management, S. Chand & Co., New Delhi.
6. Pramit Chaudhury : The Indian Economy, Poverty and development, Vikas Publishing house, New Delhi.

SEMESTER III

ALLIED - 2

PAPER - 3

C. MEDIA STUDIES I

UNIT-I

PRESS: Press system in USA, UK, - an overview of the Indian Press - Trends in mainstream and language press - Current developments - The influence of new media of technologies on the Indian print media.

UNIT-II

RADIO - A Comparative account of the world systems of broadcasting - USA, UK,, Evolution of Radio and contemporary trends in India, Prasar Bharathi - a critical account - Committees on Indian broadcasting.

UNIT III

TELEVISION - History of Television broadcasting in India - a brief comparison with UK and USA - Trends in Indian Television Industry - Various committees on Television.

UNIT-IV

CINEMA - Brief history of Cinema in the world - Cinema in India - Regional Cinema; history and recent trends - Various bodies like Censor Board, Societies, Institutes and awards.

UNIT V

NEW MEDIA - Evolution of telephones, allied media, fax, telex, Internet, DTP, Computers, Interactive video.

Reference Books:

1. Communication and Culture - A world View, K S Seetharaman, Mc Graw Hill, New Delhi.
2. Communication Studies - An introductory Reader: John Corner, Jermy Hewthorn, Edward.
3. The process of communication - an introduction to theory and practice - David K S Berlo., Rinchart.
4. Many voices and one world - UNESCO Publications.

SEMESTER III
ALLIED - 2
PAPER -3
D. JOURNALISM –I

Unit – I

Journalism: Nature, scope- functions – Role of press in democracy – principles of Journalism.

Unit – II

Kinds of Journalism – Newspapers, periodicals and specialized magazines, New Journalism, Development of Journalism, Community Journalism.

Unit – III

Press in India – Evolution of Indian press – Bengal Gazette – Kesari – J.A.Hickey, Rajaram Mohan Roy, James Silk, Buckingham, M.K.Gandhi, S.Sadanand, B.G.Horniman.

Unit – IV

Tamil Journalism – origin, growth – Factors for the growth of Tamil Journalism – Major Newspapers and Magazines of Tamil Nadu – Role of press in Nationalist Movement.

Unit – V

Review of Newspapers and periodical contents – photo Journalism. Uses of cartoons – comic strips – News Agencies – UNI, PTI – press council – Role of press in socio-cultural development.

Reference Books:

1. Nadig Krishnamoorthy - **Indian Journalism**
2. Metha, D.S. - **Mass communication and Journalism in India**
3. Nagarajan, S.- **A History of press in India.**
4. Sharma, K.C.- **Journalism in Indian History, Growth and Development,**
Regal Publications, New Delhi,2009
5. Muniruddin - **History of Journalism**, Anmol Publications, New Delhi, 2005
6. Sambanthan, Ma.Su. - **Tamil Ithaliyal Chuvadugal** (Tamil), Tamilar Pathippagam, Chennai, 1990

SEMESTER III
SKILL BASED SUBJECT

PAPER - 1

CULTURAL HERITAGE OF TAMIL NADU

UNIT-I

Introduction : Definition - Cultural Heritage - Tamilagam - Early Period: Sangam Age - Sathavahana Pallava - Chalukya - Chola - Pandya Periods - Art - Architecture.

UNIT-II

Medieval Period : Madurai Sultanate - Vijaya Nagar Period – Education, Art and Architecture.

UNIT-III

Modern Period : Nayaks - Marathas - Sultans - Poligars - Nawabs - Art and Architecture.

UNIT-IV

British Period : Islamic Scholars - Christian Missionaries - Literary contribution - cultural Heritage - Art and Architecture.

UNIT-V

Important Heritage Centres of Tamil Nadu - Need for conservation - Preservation of monuments - patronizing - Social customs - folk Art - crafts - songs - dance - music and other institutions - Places of Tourist attraction.

Reference Books:

1. 1.Chellam, V.T: Tamilagam History and Culture, Thirumalai Book House, Chennai, 1984.
2. 2.Rajayyan, K. History of Tamil Nadu(1565 – 1982), Raj Publishers, Madurai, 1982.
3. 3.Subramanian, N. Social and Cultural History of Tamil Nadu A.D. 1336 – A.D. 1984, Ennes publications, Udumalpet, 1999.
3. 4.Pillai, K.K. Social History of Tamils, University of Madras, Madras, 1975.

SEMESTER III
NON-MAJOR ELECTIVE
PAPER - 1

A. FUNDAMENTALS OF DEFENCE AND STRATEGIC STUDIES

UNIT-I

Introduction and Conceptual Formulations

- a. Introduction - The discipline of Defence and Strategic Studies - its subject contents - contemporary relevance and significance.
- b. Basic concepts of war, battle, campaign etc.
- c. Definition of security, Defence, Strategy, Peace etc.

UNIT-II

History of Warfare

- a. Historical evolution of warfare - its features and significance;
- b. Principles of war, Causes of war, functions of war;
- c. Types of war - and scope.

UNIT-III

Basics of International Relations

- a. Nature and scope of International Relations; features of International Political system - structure of International political system (Uni, Bi & Mult polar).
- b. Actors in International political system - state and non - state actors; world government (UNO).
- c. Security features in International political system - collective security, Balance of power, hegemony, Regionalism, etc.

UNIT-IV Introduction to Peace

- a. Meaning and Definition of peace; typology of peace;
- b. Approaches to peace - Disarmament, International law;
- c. Peace movement, peace Research, Peace - making, peace - building, peace- keeping.

UNIT-V

Mechanics of peace

- a. Role and functions of International organizations - League of Nations, United Nations Organizations;
- b. Amicable means to settle Inter - state conflicts;
- c. Diplomacy- scope and function; types of diplomacy

Reference Books:

1. 1.Baranwal, S.P. : Measures of Civil Defence in India: New Delhi, Guide – Publications, 1984.
2. Khera, S.S. : India's Defence problems, New Delhi, Orient Longmans, 1968.
3. 3.Waever, Ole : National Security in perspective, New Delhi, Gian, 2003. .
4. 4.Rao, PVR. :Defence without Drift, Bombay, Popular Prakasam, 1970.

SEMESTER III
NON-MAJOR ELECTIVE
PAPER - 1
B. NATIONAL MOVEMENT IN INDIA

UNIT - I

Early Nationalist Response: Causes, course, nature and impact of the Revolt of 1857 – Peasant, Tribal and Religious Movements – Political Associations in Bengal, Bombay and Madras before Indian National Congress

UNIT - II

Institutionalization of the National Movement: Factors responsible for the formation of the Indian National Congress – Origin of the Congress – Moderate Phase (1885-1905) – their nature, ideology, politics and leaders – Minto-Morley Reforms

UNIT - III

Extremist Phase (1905-1916): Partition of Bengal – Surat Split – Swadeshi and Boycott Movement – Lucknow Pact – Montague-Chelmsford Reforms

UNIT - IV

Emergence of Gandhiji: Rowlatt Act – Jalianwala Bagh Massacre – Khilafat and Non-Cooperation Movement – Swarajya Party – Simon Commission – Nehru Report – Civil Disobedience Movement – Round Table Conferences – Government of India Act 1935 – Concept of Pakistan

UNIT - V

Final Phase: Provincial Governments – Lahore Resolution – Cripps Mission – Quit India Movement – Cabinet Mission – Mountbatten Plan – Partition – Independence

References Books :

1. Tara Chand : History of Freedom Movement Vol. I - IV, Publications Division, Govt. of India, 1983.
2. Sumit Sarkar: Modern India, 1885 - 1947, MacMillan India Ltd, Madras, 1986.
3. Bipin Chandra and Others: India's Struggle for Independence, Penguin Books, 1990.

SEMESTER IV

PAPER - 7

HISTORY OF TAMIL NADU FROM A.D. 1336 TO A.D. 1806

Unit – I

Vijayanagar Empire – Genesis – Expansion of the Empire in Tamil Nadu - Kumarakampana – Tamilagam under Krishnadevaraya – Administration – social, economic and cultural conditions.

Unit – II

Nayaks of Madura, Gingee, Tanjore and Vellore- Administration – Social and Economic life- Education – Literature – Religion – Art and Architecture.

Unit – III

The Marathas of Gingee and Tanjore – Social , Economic and Cultural conditions – Sethupathis of Ramnad – Nawabs of Arcot – Administration and Society.

Unit – IV

The advent of the Europeans – European settlements in Tamil Nadu – European interference and Carnatic wars – Mysore wars in Tamil country.

Unit – V

Poligar Rebellion – Bhulithevan – Dheeran Cinnamalai - Kattabomman – South Indian Rebellion of 1800 – 1801 – Vellore Mutiny of 1806.

Reference Books:

- | | |
|-------------------------------------|---|
| Beauchamp, Henry & Abbe.T.A.Dubois, | Hindu Manners, customs and ceremonies , Clarendon press, London, 1897. |
| Kesavan Veluthat, Longman | A political Structure of Early Medieval South India , orient Ltd, New Delhi, 1993. |
| Krishnasamy Iyengar,S., | South India and her Muhammadan Invaaders , S.Chand & Co. (Pvt).Ltd.,New Delhi, 1921. |
| Krishnasamy,A. | The Tamil Country under Vijayanagar , Annamalai University Publication, 1964. |
| Mahaligam,T.V., | Administration and Social Life under Vijayanagar , Vol-I & II University of Madras, Madras, 1940 & 1975. |
| Majumdar, R.C, | The History and cultural of Indian people , Vols.VI to X, Bharathiya Vidyabhavan, Bombay, 1976. |
| Malleson,G.B., | History of French in India (1674-1761 A.D) , Longmans Green & Co., London,1868. |
| Noboru Karashima, | South Indian History and Society , Oxford university press, Madras, 1984. |
| Sathiyanaithaiyer R., | History of the Nayaks of Madura , University of Madras, Madras, 1980. |
| _____ | Tamilagam in the 17th Century , Madras, 1956. |
| Venkataramanayya,N., | Early Muslim expansion in South India , Annamalai University Publication, 1943. |

SEMESTER –IV

PAPER -8

HISTORY OF TAMIL NADU FROM A.D.1806 TO A.D.2011

Unit-I

Administrative Policies of the British – Land Revenue – Ryotwari system – Judiciary – Education – Impact of Christian Missionaries

Unit-II

Socio –Religious Reform Movements – Vaikuntaswamikal – Vallalar – Vedanayagam pillai – Indian National Congress – Role of Tamil Nationalists – Moderates – Extremists – VOC, Bharathi, Subramaniya Siva – Revolutionaries – V.V.S Iyer – Vanchi – Neelakanda Brahmachari, Chenbagaraman

Unit-III

Khilafat Movement – Dyarchy in provinces – Justice Party and its Administration – EVR and Self Respect Movement – Civil Disobedience Movement – Quit India Movement – Indian Independence.

Unit-IV

Linguistic Reorganisation of States – Rajaji - kamaraj – Anti – Hindi agitation – Election of 1967- Emergence of Dravidian Regime.

Unit-V

Tamil Nadu under Dravidian parties – Annadurai – Karunanithi – MGR – Jayalalitha Development of Tamil Nadu under Congress, DMK and AIADMK.

Reference Books:

1. Balaji.B.S **Studies in Madras Administration**, 2Vols.
2. Balasundaram.N, **The Dravidian Movement in Madras.**
3. Hardgrave L.Robert, **The Dravidian Movement**, Bombay 1965.
4. Kandasamy.P, **The Political Career of Kamaraj**, Concept Publishing Company, New Delhi 2001.
5. Nambi Arooran.K, **Tamil Renaissance and Dravidian Nationalism.**
6. Paramarthalingam.C, **Religion and Social Reform in Tamil Nadu**, Rajakumari Publication, Madurai, 1997.
7. Ramamurthi.P, **The Freedom Struggle and the Dravidian Movement.**
8. Sivagnanam.M.P, **Viduthalai Poril Tamilagam (Tamil)** 2Vols, Poongkodi Pathippagam, Chennai, 2005.
9. Stalin Gunasekaran.T, **Viduthalai Velviyil Tamilagam (Tamil)**, 2 vols.
10. Viswanathan.E.S.K, **The Political Career of EVR**, Ravi & Vasanth Publication, Madras 1983.

SEMESTER IV

ALLIED-2

PAPER - 4

A.TOURISM II

Unit - I

Growth and Development of Modern Tourism- Role of Travel Agency in Tourism- Role of State Govt. in promoting Tourism-Passport and Visa-Package tour.

Unit - II

International Organisation and Tourism- International union of Official Travel Organisation(IUOTO)-World Tourism Organisation (WTO)-Pacific Area Travel Association (PATA)- International Air Travel Transport Association(IATTA)- International Civil Aviation Organisation(ICAO).

Unit - III

Travel Management- Tourism Principles- Practices and Ethics- Hotel Operation- Fares and Ticketing-Travel Agency-Tour Operation Management.

Unit - IV

Tourism and National Economy- Mass Production- Economic Benefits-Development of Infrastructure and Regional Development.

Unit - V

Geography of India with special reference to Important Tourist attraction in India.

References Books:

1. A.K. Bhatia; Tourism development principles and practices; Sterling publishers (P) Ltd., New Delhi.
2. Anand, M.M.; Tourism and hotel industry in India; Sterling Publishers (P) Ltd., New Delhi.
3. Acharya Ram; Tourism and Cultural Heritage of India; ROSA Publications, Jaipur.
4. R.K. Sinha; Travel and Tourism Management; Dominant Publishers; New Delhi.
5. Ramila Chawla; Travel and Tourism Management - Dominant Publishers, New Delhi.
6. Prem Seth; Successful Tourism Management - Fundamental of Tourism; Sterling Publishers (P) Ltd., New Delhi.
7. Nirmal Kumar; Tourism and Economic Development; APLL Publishing Corporation; New Delhi.

References:

1. K.K. Sharma; Tourism and Culture; Sarup and Sons Publishers; New Delhi.
2. A.K. Bhatia; International Tourism Management; Sterling Publishers (P) Ltd., New Delhi.
3. Ratandeep Singh; Infrastructure of Tourism in India; Kanishka Publishers, New Delhi.
3. Arun Kumar Sarkar; Action of Plan and Priorities in Tourism Development; Kanishka Publishers; New Delhi.
4. Dr.B.R. Kishore; India - A Travel Guide; Diamond Pocket Books (P) Ltd., New Delhi.
5. P.C. Sinha; Tourism Evolution Scope, Nature and Organization; Anmol Publications Pvt. Ltd., New Delhi.

SEMESTER IV
ALLIED-2
PAPER - 4
B. INDIAN ECONOMY II

UNIT-I

Industrial Finance - need and sources of credit; Development Financial Institutions (IFCI, SFC, ICICI, IDBI, SIDBI, IIBI, EXIM Bank, etc.) Foreign Capital - Various forms (Foreign Public vs Private and Loans vs. Investments, etc.,) FDI and FII.

UNIT-II

Privatisation and Economic Reforms; Public Vs. Private Sector - debate, New Economic Policy (Liberalisation, Privatisation and Globalisation); Economic Reforms Phase-I (1985-1990); Phase II 1991 & after; (reforms pertain to the following policies: Fiscal, Monetary, Pricing, Industrial, Trade, Public Sector, External and Foreign Investment) Common Minimum Programme (CMP)

UNIT-III

Human Resource and Economic Development; Unique demographic features in India (growth rate, density, Gender-wise and age-wise distribution, etc.,) New population Policy (Integration of Economic and Population Planning). Unemployment and Poverty : - Remedial measures and Govt. schemes like IRDP, Micro Finance, etc., Business Process Outsourcing (BPO) - the Problems and Benefits to India.

UNIT-IV

Labour Economics: Trade Unions - Industrial Relations - (Industrial Disputes) - Mechanisation and labour problems - Labour Legislations - Social Security Schemes - recent policy changes - contributory pension schemes, etc.,

UNIT-V

Foreign Trade and Balance of Payments - Position, Problems and measures to improve; India in the Global Market. Functions of IMF, IBRD and WTO.

Reference Books:

1. Agrawal, A.N. : Indian Economy, Vikas Publishing House, New Delhi.
2. Alak Ghosh : Indian Economy, The World Press, Kolkatta.
3. Bimal Jalan : Indian Economic Crisis, Oxford University Press, Chennai.
4. Dewett, Verma & Sharma : Indian Economics, S.Chand & Co.,
5. Dhingra, I.C. : Indian Economy, Sultan Chand & Co.,
6. Jhingra, M.L. : Economics of Development & Planning, Konark Publishers, New Delhi.
7. Kanka, S.S. : Human Resource Management, S.Chand & Co.,
8. Mongia, J.N. (Editor) : India's Economic Policies, Allied Publishers
9. Pramit Chaudhury : The Indian Economy, Poverty and Development, Vikas Publishing House, New Delhi.
- 10 Pramod Verma : Labour Economics and Industrial Relations, Tata McGraw Hill
11. RBI Bulletin.
- 12 Rudar Datt & Sundaram : Indian Economy, S.Chand & Co.
- 13 Sankaran,.S. Dr : Indian Economy, Margham Publications, Chennai.
- 14 Shiva Ramu : Globalisation, The Indian Scenario, S.Chand & Co.,
- 15 Sivayya,K.V.& : Indian Industrial Economy, S.Chand & Co.,
- 16 Uppal : Indian Economic Planning, Macmillan India Pvt. Ltd.,
- 17 Velayutham : Foreign Trade, Theory & Practice, S.Chand & Co.,

SEMESTER IV

ALLIED-2

PAPER - 4

C. MEDIA STUDIES II

UNIT-I

Communication - Definitions - scope - forms and purpose - intra-personal - interpersonal, mass, organizational, non-verbal, verbal. The process - sources - message - channel - receiver - feedback - noise.

UNIT-II

Advertising - public relations and propaganda - public opinion - characteristics and functions of mass media - Radio - Television - Print - Films

UNIT-III

Newspapers and magazine - types of news and magazines - structure and organization of newspapers and magazines in India : an overview.

UNIT-IV

Radio as a medium of mass communication - types of ownership - audience - commercial radio for education - All India Radio - emerging trends - Television as a mass medium - role and characteristics - ownership - organizational structure of Doordarshan – Satellite and cable TV.

UNIT-V

Motion picture - historical background - structure and organization of motion picture industry in India - technical aspects - status, problems and prospects of films as medium of entertainment - documentary films.

Reference Books:

1. Communication and Culture - A world View, K S Seetharaman, Mc Graw Hill, New Delhi.
2. Communication Studies - An introductory Reader: John Corner, Jermy Hewthorn, Edward.
3. The process of communication - an introduction to theory and practice - David K S Berlo., Rinchart.
4. Many voices and one world - UNESCO Publications.

SEMESTER IV
ALLIED-2
PAPER - 4
D. JOURNALISM –II

Unit – I

Introduction to Journalism – Impact of mass media Fourth Estate – Development of Journalism through the ages – From J.A.Hickey to 1947 and post Independent period.

Unit – II

Reporting – Kinds of News – News values – Reporters – News Agencies – beat – reporting of public meeting – crime and sports.

Unit – III

Editing – use of Editing marks – qualifications and functions of an Editor and sub-Editors – Inverted pyramid form of writing – page make up – Headline – Lead – feature Editorial – Letters to the Editor.

Unit – IV

Rotary – Letter press – offset printing – Role of computers and communication Techniques – structure and functioning of Newspaper office – Advertisement.

Unit – V

Indian press Laws – Defamation – contempt of court - official Secret Act – Indian constitution and freedom of press – press council – Prachar Bharathi – investigative Journalism.

Reference Books :

- | | | |
|---|---|--|
| 1. Ahuja, A.N. | – | Theory and practice of Journalism, Surjeet publication, Delhi, 1984. |
| 2. Kamath, M.V. | – | Professional Journalism. |
| 3. Natarajan, S. | – | A History of the press in India. |
| 4. Rangasamy Barthasarathy | – | Journalism in India. |
| 5. Nadig Krishnamoorthy | – | Indian Journalism. |
| 6. Carole Flemming and Emma Hemmi'ngway | – | Introduction to Journalism |
| 7. Gurusamy, M.P. | - | Journalism (Tamil), Guru – Thenmozhi, Publication, Dindigul, 2009 |
| 8. Samy, A.M. | - | Origin and growth of Tamil press (Tamil) Namani Pathippagam, Chennai, 1987 |

SEMESTER IV
SKILL BASED SUBJECT
PAPER - 2
HUMAN RIGHTS EDUCATION

UNIT-I

Definition - Nature - content - Legitimacy and priority - Theories of Human Rights - Historical development - world war I and II - UNO - and UDHR - International Governments on Economic - social - cultural - political and civil Rights.

UNIT-II

Agencies of Human Rights - UN High Commission for Human Rights - Amnesty International - Human Rights watch - International commission of Juries - Human Rights court - mechanisms to uphold and foster Human Rights.

UNIT-III

Contemporary issues of Human Rights - women, children Dalits, bonded Labour, Slavery - Refugees, capital punishment - demand for 4 freedoms - State Vs Human rights and Terrorism Vs Human Rights.

UNIT-IV

Indian Constitution and Human Rights - Fundamental Rights and Duties - Directive principles - National Commission for Human Rights - state Agencies - Human Rights and courts - Human Rights and Media - OCHR - PUCL and peoples watch.

UNIT-V

Emerging trends in Human Rights - Rights of cross gender, detemis, prisoners, street children - sex harassment to women at home and work places - organ sale - illegal traffic of women - police and human rights.

Reference Books:

1. Andrew, J.A. & Hines, W.D. International protection of human Rights, London, Mansell publishing Ltd., 1987.
2. Carnston, Maurice: What are Human Rights?, London, The Bodlay Ltd., 1973.
3. Desai A.R. ed.: Violations of Democratic Rights in India, Bombay, Popular prakasam, 1986.
4. Sivakami Paramasivam: Studies in Human Rights, Salem, 2000.

SEMESTER IV
NON-MAJOR ELECTIVE
PAPER - 2

A. FUNDAMENTALS OF NATIONAL SECURITY

Objective:

To develop a special subject knowledge on the vital concept of National Security - and the approaches to achieve National Security (Special reference to India).

UNIT-I

Introduction

- a. Definition, Scope and features of the concept of National Security
- b. Concept of National Power - elements of national power (tangible and intangible).
- c. Fundamental factors - values - goals and policies that determine National Security.

UNIT-II

Foreign policy & Defence policy

- a. Definition - meaning - scope of foreign policy and defence policy.
- b. Determinants of foreign policy and defence policy.
- c. Instruments of foreign policy and defence policy - Diplomacy and defence

UNIT-III

Approaches to National Security

- a. Coercive and non - coercive approach - meaning and scope
- b. Coercive means - threats - threat perception and defence apparatus - armed forces - its organization and functions (India).
- c. Non - coercive means - peace mechanics - peace making; peace building.

UNIT-IV

Strategic Environment - India

- a. Feature of strategic environment - its scope in policy making
- b. India's strategic environment - immediate neighbours - adjacent regions - Indian Ocean and global structure.
- c. India's Military preparedness - Defence budget - force structure and organization

UNIT-V

India's strategic relationship (Salient features)

- a. India - Pakistan Politics - strategic relations
- b. India - China politics - strategic relations
- c. India and World powers.

Reference Books:

1. Baranwal, S.P. : Measures of Civil Defence in India: New Delhi, Guide – Publications, 1984.
2. Khera, S.S. : India's Defence problems, New Delhi, Orient Longmans, 1968.
3. Waever, Ole : National Security in perspective, New Delhi, Gian, 2003.
4. Rao, P.V.R. : Defence without Drift, Bombay, Popular Prakasam, 1970.

SEMESTER IV
NON-MAJOR ELECTIVE
PAPER - 2
B. INDIAN CONSTITUTION

UNIT – I:

Historical Background – The Preamble – Basic Principles – Salient features.

UNIT –II:

Fundamental Rights – Fundamental Duties – Directive Principles of State Policy.

UNIT – III:

Union Government: Executive – Legislature –Judiciary – Independent Court – Judicial Review – Judicial activism.

UNIT - IV:

Government of the state and Local Government: Executive – Legislature – Judiciary – Panchayat Raj – Municipalities.

UNIT – V:

Relations between the Union and the States – Public Services – Public Service Commission's – Amendments.

Reference Books:

1. Bidyut Chakrabarty and Rajendra Kumar Pandey, Indian Government and Politics, New Delhi: Sage Publications, 2012.
2. Durga Das Basu, Introduction to the Constitution of India, New Delhi: Prentice Hall, 1996.
3. Gautam, D.N. Fifty Years of Indian Constitution, New Delhi: Manak Publication, 2001.
4. Mehta, S.M. Constitution of India and Amendment Acts, New Delhi: Deep & Deep, 1990.
5. Kapur, A.C. Select Constitutions, New Delhi: S. Chand & Co., 2005.
6. Subba Rao, T.V. Constitutional Development in India, New Delhi: Deep & Deep , 1996.
7. Pylee. M.V. – India's Constitution, New Delhi: S. Chand & Co, 2005.

SEMESTER – V

PAPER - 9

HISTORY OF EUROPE FROM A.D.1453 to A.D.1789

Unit - I

Beginning of Modern Age - Geographical Discoveries - results - Importance of the year 1453 -Transition from medieval to modern age.

Unit - II

Renaissance in Italy - Literacy Renaissance, Francesco, Petrarc, Giovanni Boccascio - Artists of Renaissance: Leonardo - da - Vinci, Raphel, Michael Angelo - Venetian School of Painting -Effect of Renaissance.

Unit - III

The Development Stages of Reformation: Martin Luther - Henry VIII of England - Charles V - Phillip II of Spain - Counter Reformation - Thirty Years war.

Unit- IV

Louis XIV - Achievements - Foreign Policy - The Dutch War: Spanish War of Succession – The Treaty of Utracht, 1713, Fredrick The Great.

Unit- V

The War of Austrian Succession - Maria Therasa's domestic and foreign policy - Joseph II- reforms - Peter the Great - reforms and foreign policy - Catherine II - reforms and foreign policy - Unrest in Europe - Impact of the American war of Independence - Louis XVI of France.

Reference Books:

1. C.D.M. Ketelby : A History of modern times from 1789, George G. Harrap & Co. Ltd., London, 1964.
2. B.V. Rao : History of Europe Sterling Publishes Pvt. Ltd., New Delhi, 2000.
3. H.A.L. Fisher : From the beginning of 18th Century to 1935 A.D., Vol. - 11 Surjeet Publications, Delhi - 1987.

SEMESTER V
PAPER - 10
HISTORY OF U.S.A. FROM A.D.1861 TO A.D.1932

UNIT-I

Abraham Lincoln - Civil War - Causes, Course and Results - Reconstruction and its kinds - end of the Reconstruction.

UNIT-II

Rise of Big Business - Rail Roads - Growth of Industry - Labour Movement - Granger - Populist Movement.

UNIT-III

Growth of Imperialism - the Spanish - American War, 1898 - Open Door Policy - The Westward movement (1861-1900) - End of Frontier.

UNIT-IV

Theodore Roosevelt - Progressive Reforms - Foreign Policy - W.H. Taft - Dollar Diplomacy - Woodrow Wilson - New Freedom.

UNIT-V

USA and First World War - 14 points - Treaty of Versailles - Warren Harding - Coolidge Prosperity - Hoover - Great Depression.

Reference Books:

1. Hill. C.P. : History of the United States, Edward Arnold, London, 1974.
2. Hofstadter : The American Republic, Vol 1, Upto 1865, Prentice - Hall Miller & Arooran. K Engle Wood Cliffs, New Jersey, 1959.
3. Nambi Arooran. K. : History of United States of America (Tamil), Tamil Nadu Text Book Society, Government of Tamil Nadu, Cehnnai, 1975.
4. Parkes, H.B. : The United States of America - A History Khosla Publishing House, Delhi, 1986.
5. Rajayyan. K. : A History of the United States, Madurai Publishing House, Madurai, 1978.

SEMESTER – V

PAPER - 11

HISTORY OF CHINA AND JAPAN FROM A.D.1900 TO A.D.2000

UNIT - I

Boxer rebellion - Manchu reforms - Dr. Sun Yat Sen and 1911 Revolution - Decline of Manchus - Yuan Shi Kai.

Unit - II

China and the First World War - May 4th Movement - Washington Conference - Rise of Kuoming - Tang Party- Chaing Kai Sheik - Birth of Civil War in China - Manchurian Crisis - Second Sino - Japanese war.

Unit - III

Mao's era - Establishment of Peoples Republic of china (PRC) - Cultural Revolution in China -

Estimate of Mao - Post Mao era - China in the World affairs till ad 2000.

Unit- IV

Rise of Imperialism - First Sino - Japanese War - Anglo, Japanese Alliance - Russo – Japanese War - First World War and Japan - Washington Conference, London Naval Conference.

Unit- V

Rise of Militarism - Japan and Second World War - Social - Economic and Political Changes in Japan from 1919 to 1950 - Foreign Policy of Japan from 1950 to AD 2000.

Reference Books:

- 1) Ahamed L.L : A Comprehensive History of the Far East. S. Chand and Co.,Ltd, New Delhi, 1981.
- 2) David, M.D.I,the Making of Modern China. Himalaya Publishing House, Bombay, 1993.
- 3) Paul.H.Clyde & Burton.F.Beers,The Far East - A History of Western Impact and Eastern responses 1830 - 1975.Pemtice Hall of India [p] Ltd., New Delhi,1988.
- 4) Ross Terrill,The Future of China after Mao.Clrion Books, Delhi,1987.
- 5) Sukaiming Modern China - A Topical History, New World press, Beijing, 1986.
- 6) Vinacke.H.M.A History of the Far East in Modern Times. Kalayani Publishers, New Delhi,1989.

SEMESTER V

PAPER - 12

CONSTITUTIONAL HISTORY OF INDIA FROM A.D.1773 TO A.D.1950

UNIT – I:

Historical Background - Regulating Act of 1773 – Pitt’s India Act of 1784.

UNIT – II:

Charter Act of 1793 – Charter Act of 1813 - Charter Act of 1833 – Charter Act of 1853.

UNIT – III:

Queen’s Proclamation – Government of India Act of 1858 – Indian Council’s Act of 1861 - Indian Council’s Act of 1892 – Minto – Morley Reforms of 1909.

UNIT – IV:

Montagu’s Declaration – Government of India Act of 1919 – Working of Dyarchy – Simon Commission – Round Table Conferences.

UNIT – V:

Government of India Act of 1935 – Working of Provincial Autonomy - Indian Independence Act of 1947 – Indian Constitution of 1950.

Reference Books:

1. Pylee. M.V. – India’s Constitution, New Delhi: S. Chand & Co, 2005.
2. Pylee, M. V. - Constitutional History of India, New Delhi: S. Chand & Co. 2003.
3. R.C. Agarwal, Constitutional Development and National Movement in India, New Delhi: S. Chand & Co., 2005.
4. A.C. Kapur & K.K. Mishra. – Select Constitution, New Delhi: S. Chand & Co, 2005.
5. R.C. Agarwal, Indian Political System. New Delhi: S. Chand & Co, 2003.

SEMESTER V

ELECTIVE

PAPER - 1

A. HISTORY OF FREEDOM MOVEMENT IN TAMIL NADU FROM A.D. 1800 TO A.D. 1947

UNIT-I

Genesis of Freedom movement - The poligari Revolt South Indian Rebellion, Vellore Mutiny - causes, course and results.

UNIT-II

Formation and Growth of Indian National Congress - Growth of western Education - Socio - Economic - religious Factors - Role of Press - Pre - Congress political Associations - British Birth of Indian National Congress - Tamil Nadu in the congress sessions - Moderates and Extremists.

UNIT-III

Swadeshi Movement - Surat split - Extremist activities - Vanchinathan - senbagaraman - Home rule Movement - Madras presidency Association - Role of justice party - consequences of Jallian wala Bagh Massacre.

UNIT-IV

Emergence of Gandhiji - Non - cooperation Movement - Civil Disobedience Movement - Swarajya party - Neill Statue Satyagraha - Vedaranyam salt Satyagraha - II world war - Quit India Movement - INA trails - Independent India.

UNIT-V

Tamil Nationalists – Thilliyadi valliyyammai - Subramaniya Siva – Bharathiyar - Thiru.Vi.Ka Dr. P. Varadarajalu Naidu - S. Sathiyamoorthy - Rukmani lakshmipathi - Rajaji - E.V Ramasamy - Satyamurthy - Kamaraj - Jothi Venkatachalam - Maragatham Chandrasekar.

Reference Books:

1. Baker, C. J - The politics of South India 1920 - 37, Cambridge University press, 1976.
2. Baker, C. J and Wash Book, D.A - South India - Political Macmillan company Ltd, New Delhi, 1975.
3. Copley, ARH - The political career of C. Rajagopalachari 1937 - 54, The Macmillan company of India Ltd, Madras, 1978.
4. Ganesan, A - The press in Tamil Nadu and struggle for Freedom 1917 - 37, Mittal Publications, New Delhi, 1989.
5. Kandaswamy, P - The Political career of K. Kamaraj, concept publishing company, New Delhi, 2001.
6. Nambi Aroran, K - Tamil Renaissance and Dravidian Nationalism 1905 - 1944, Koodal Publishers, Madurai, 1980.
7. Pattabi Sitarammaya, B - History of India National Congress (1885 – 1935), The Congress Working Committee are the Occasion of 50th Anniversary of Congress, Madras, 1935.
8. Rajaramman, P - The Justice Party - A Histocial perspective 1916 - 37. Poom Pozhil Publishers, Madras - 1998.
9. Rajayyan, K - History Tamil Nadu 1565 - 1982, Raj Publishers, Madurai, 1982.
10. Sivagnanam, M.P. - Viduthalaipporial Tamilzhagam, (Tamil) Vol. I and II. Poongodi pathippagam, Chennai, 2005.
11. Sundralingam, R. - Politics and Nationalist Awakening in South India 1852 - 1891, Rawat Publications, New Delhi, 1980.
12. Viswanathan, E.Sa, - The Political Career of E.V. Rana Sami Naicker, Ravi and Vasanth Publications, Madras. 1983.

SEMESTER V

ELECTIVE

PAPER - 1

B. WOMEN DEVELOPMENT IN TAMIL NADU FROM A.D.1900 TO A.D.2000

UNIT - I

Status and role of women - Feminist Theories - Feminism - position of women in Tamil Nadu.

UNIT - II

Traditional Tamil Society - women in sangam - muslim - modern period.

UNIT - III

Movements for Women in the 19th and 20th centuries - International women's year decade for women 1975 - 1985.

UNIT - IV

Women Organization - Social reform and welfare in Tamil Nadu Govt. policy on women 1947 to 2001.

UNIT - V

Women empowerment - social economic political challenges facing women - women at work - violence - personal law - women in panchayat raj - Women and Self Help Group - reservation for women in parliament.

Reference Books:

1. Kum Kum Sangari & Sudesh veid : Recasting women, Essay in Colonial History, Kali for women, 2006.
2. Sushila kaushik: Panjayat Raj in Action, Challenges in women's Role, Delhi, 1996.
3. Nivedita menon : Gender & Politics in India, New Delhi, OUP, 1999.
4. Madhu Vij : Women studies in India , A journey of 25 years, Rawat, 2014.

SEMESTER V
ELECTIVE
PAPER -1
C. ARCHAEOLOGY I

Objectives:

The Study of Archaeology through Epigraphy, Numismatics, Excavation and Monuments helps to understand the history of ancient period. It is a base to graduates to understand the source materials.

UNIT – I:

Definition of Archaeology – History of Archaeology in India – Nature and Scope

UNIT – II:

Aims of Excavation – Exploration – Excavation – Dating Methods in Archaeology

UNIT – III:

Ceramic Culture – Pottery Types – Graffiti Marks – Its Importance

UNIT – IV:

Stone Age Culture – A Brief Survey of Paleolithic – Mesolithic and Neolithic culture in India

UNIT – V:

Harappan Culture – Chalcolithic Culture of Western and Central India – Early Iron Age Culture – Megalithic Culture of South India

Reference Books:

1. Gurumurthy. S : Ceramic Traditions in South India, University of Madras, 1981
2. Magalingam T.V. : Early South Indian Paleography, Madras University, Chennai 1967.
3. Narasimman.B : Neolithic Culture in Tamil Nadu, Sundep Publication, New Delhi, 1980.
4. Ramachandran K.S. : A Bibliography of Indian Megalithics, The State Department of Archaeology,
1. Tamil Nadu, 1971.
5. Dr. Raman. K.V., Principles and Methods of Archaeology, Parthajan Publications, Chennai, 1988.
6. Rao.S.R. : Lothal and the Indus Civilizations, Asia Publishing House, Bombay, 1973.
7. Dr. Venkataraman. R. : Indian Archaeology – A Survey, Ennes Publications, Udumalpet, 1999.

SEMESTER V
SKILLED BASED SUBJECT
PAPER - 3

INTELLECTUAL HISTORY OF TAMIL NADU FROM A.D.1700 TO A.D.2000

UNIT-I

Political : Pasumpon Muthuramalinga Thevar - Thillaiyadi Valliyammai - Rettamalai Srinivasan - M.C. Raja - Rajaji - E.V. Ramasamy - Kalaingar Karunanidhi – Dr.M.G. Ramachandran, Puratchi Thalaivi Dr. J. Jayalalitha.

UNIT-II

Social : Ramalinga Adigal - Vallal Azagappan - Bharathidasan - Arcot Brothers - (AL & A.R. Mudaliar) Ida Scudder Ammaiyar - Jamal Mahammed – C. Abdul Hakeem Sahak.

UNIT-III

Religious : Joseph Constantine Beschi – Ziegch Balque - Vaikunta swamigal - Mrs. Anne Besant - Umaru Pulavar - Kirubaananda Variyar - Swami Sahajananda.

UNIT-IV

Cultural : Seethakkadi - Ayodhya Das Pandithar - G. Subramaniam Iyer - Bharathiyar - M.S. Subulakshmi - Pattukottai Kalayna Sundaram - Aranthai Narayanan - Kannadasan - Padma Subramaniam - Justice M.M. Ismail – Sheik Chinna Sahab

UNIT-V

Scientific : G.D. Naidu - M.S. Swaminathan - Dr. Santappa - Dr. Abdul Kalam - N. Ramadurai

Reference Books:

1. Paramarthalingam C Religion social reform in Tamil Nadu, Rajakumari publications, Madurai, 1997.
2. Sen, S.P. (Ed.,) Social and Religious reform movements in the 19th and 20th centuries, Calcutta Institute of Historical studies, 1979.
3. Pillai, K.K. Tamilaga Varalaru, Makkalum Panpadum (Tamil) International Institute of Tamil Studies, Chennai - 2004.
4. Rajayyan, K History of Tamil Nadu (1585 - 1982) Raj Publishers, Madurai, 1982.
5. Viswanathan, E. Sa., The political career of E.V.R. Ravi & Vasanth Publication, Madras, 1983.
6. Sivagnanam, M.P., Viduthalaiporil Tamilagam (Tamil) Vol. I & II, Poongkodi Pathipakkam, Chennai, 2005.

SEMESTER – VI

PAPER - 13

HISTORY OF EUROPE FROM A.D.1789 TO A.D.1945

UNIT-I

French Revolution - Causes, Course and results - Rise of Napoleon Bonaparte – French Revolution consulate - Constitution of 1799 - Napoleon as emperor - Napoleonic wars - continental system causes of the failure of the Napoleon - Napoleon's domestic reforms.

UNIT-II

Vienna congress - Holy Alliance - concert of Europe - causes for the failure – Metternich - Louis XVII - Charles X - Revolution 1830 and its results - Louis Philip - causes and course of 1848 Revolution - Effect - Louis Napoleon as president and as emperor - Napoleon III - His wars - Failure - III republic of France.

UNIT-III

Unification of Italy: Role of Cavour, Garibaldi, Mazzini, and Victor Immanuel II – Roman question - Unification of Germany - Bismarck - Fall of Bismarck.

UNIT-IV

Eastern Question - The Greek war of independence - The Crimean war - Young Turk Movement - Balkan wars - First world war - League of Nations - Mustafa Kamaal Pasha - Russian revolution of 1917.

UNIT-V

Nazism - Fascism - Mussolini - Europe between the two world wars - Second World War - UNO.

Reference Books:

1. BV. Rao : History of Modern Europe (1789 - 1992) Sterling Publishers Private Ltd., New Delhi -16.
2. C.D.M. Ketelby : A History of modern times from 1789, George G. Harrap & Co. Ltd., London 1964.
3. H.A.L. Fisher: From the beginning of 18th Century to 1935 A.D., Vol. - 11 Surjeet Publications, Delhi - 1987.

SEMESTER – VI
PAPER – 14
HISTORY OF U.S.A. FROM A.D.1932 TO A.D.2000

UNIT-I

Franklin D. Roosevelt - New Deal - Good Neighbour Policy - USA and Second World War.

UNIT-II

Domestic and Foreign Policy of Harry.S. Truman - Cold War- D. Eisen hower.

UNIT-III

John. F. Kennedy - Internal Policy - Foreign Policy - Civil Rights Movement - Martin Luther King.

UNIT-IV

Lyndon.B. Johnson - Richard Nixon - Gerald Ford - Jimmy Carter.

UNIT-V

America under Ronald Reagan - George Bush (Sr) - End of Cold War - Bill CJinton.

Text Books and Reference Books:

1. Hill C.P.: History of the United States, Edward Arnold, London, 1974.
2. Hofstadter, Miller & Aaron: The American Republic, Vol.II, Since 1865, Prentice - hall, Engle Wood Cliffs, New Jersey, 1959.
3. Parkes, H.B.: The United States of America - A History, Khosla Publishing House, Delhi, 1986 .
4. Rajayyan. K.: A History of the United States, Madurai Publishing House, Madurai, 1978.
5. United States Information Agency: n outline of American History, 1994.

SEMESTER VI
PAPER-15
INTERNATIONAL RELATIONS SINCE A.D.1945

UNIT-I

Nature of International Relations - National Power and Instruments for the Promotion of National interests - Diplomacy.

UNIT-II

Inter-War Years - Reparation - Inter Allied debts - World Economic crisis - Collective security - Rise of Dictatorship - Totalitarianism.

UNIT-III

Second World War - Peace Settlements - Military alliances - Emergence of Power Blocs - Cold War - UNO - Detente.

UNIT-IV

Disarmament and arms control - Disintegration of U.S.S.R - Emerging New world order - Multipolar vs. Unipolar Concepts - Fight Against Terrorism.

UNIT-V

Present trends in International associations (Role of International Associations such as Common wealth, NAM, SAARC, OAU, ASEAN, G-8, G-15, G-77, European Union) .

Reference Books:

1. Carr.E.H : International Relations between the two world wars, 1919-1939, New York, 1966.
2. Calvecoressi, P. : World Politics since 1945.
3. Moon, P.T. : Imperialism and World Politics , The Macmillan Company, New York, 1926.
4. Morgenthau, Hans.J: Politics among nations, The struggle for Power and Peace, New York, 1973.
5. Palmer and Perkins: International Relations, Third Ed, AITBS Publishers & Distributors, Delhi, 2000.
6. Prakash Chander & Prem Arora : International Relations, Cosmos Bookhive (p) Ltd. Gurgaon.
7. Schleicher, C.P : International Relations , New Delhi, 1963.
8. Schuman, F.: International Politics, 6th Ed, McGRaw Hill Book Company, New York, 1958.
9. Sen.A.K : International Relations since 1919, S.Chand & Co., Ltd, New Delhi, 1993.
10. Wright, Q : The study of International Relations, Appleton - Century - Crafts, New York, 1955.

SEMESTER VI

ELECTIVE

PAPER - 2

A. HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA UPTO A.D.1900

UNIT-I

Pleistocene - Evolution of man - Paleolithic Stone Industries - Mesolithic Technology (Microlithis) Rock Art - Invention of fire and wheel - The impetus for Metallurgy - Impact of Iron and Bronze.

UNIT-II

Harappan Town Planning pattern - Vedic Agricultural and Industrial systems - stone and Metal Sculptures - Painting and its composition - seals , pottery.

UNIT-III

Ancient method of cultivation - craft production and technology - science of Mathematics and Astronomy during Gupta Period - changes in Architecture during Mauryan, Gupta and Kushana period.

UNIT-IV

Technology and Non - agricultural production methods from 1200 AD to 1707 AD - changes in Architectural style and paintings (1200 AD - 1707 AD) - Sawai Jai Singh and his observatories (Astronomy).

UNIT-V

Introduction of Modern Sciences by the Europeans - Asiatic Society of Bengal - Social needs and Technological applications - Limitations in pre - industrial manufacturing - Industrial Revolution in British India upto 1900.

Reference Books:

1. Studies in the History of Science in India, Anthology, D.D. Chattopadhyaya.
2. History of Science and Technology in India, G. Kuppuram and K. Kumudamani.
3. History of Science and Technology in Ancient India, D.D. Chattopadhyaya.
4. Department of science and Technology - Government of India - Website.
5. Council of Scientific and Industrial Research Website.

SEMESTER VI

PAPER -2

B. DRAVIDIAN MOVEMENT IN TAMIL NADU UPTO A.D.1947

UNIT- I

Dravidians - Anthropological definition - Indo Aryan Race and Dravidians – British - Caldwell's contribution - western Education and Indian Renaissance Early Dravidian Leaders - Madurai Pillai - P.V. Subramanin Pillai - Chinna Thambi Pillai - Attempt of Ayothidasa pandithar - Rettai malai Srinivasan for consolidation - Founding of Adi Davida Mahajana Sabha 1894.

UNIT-II

South Indian Liberal federation, 1916 - P.T. Thiyagaraya chetti - Dr. C. Natesa Mudali - Dr. T.M. Nair - Founding of Dravidan - Justice and Andhra Prakasika - Non Brahmin Manifesto - Justice Party - Demand for Communal Award - Sathbough commission - Meston Award - 1919.

UNIT-III

Election of 1920 - Justice Party Government - Elections of 1923, 1926, 1929, and 1932 - changing affiliations - services of the Justice Government - Socio educational - economic sectors - demand for separate electorate by Depressed class leaders - M.C. Raja - Rev. D. John Rathinam - N. Sivaraj. 1934 - EVR and 16 points accepted for Justice party.

UNIT-IV

Elections of 1937 - Fall of the Justice party - Rajaji as congress premier - Hindi imposition - E.V Ramasamy Periyar - Self Respect and Rationalist Association - leader of Justice party 1938 - Anti Hindi struggle - Demand for separate Dravidasthan 1939.

UNIT-V

Second World War and Justice party - demand for Dravidasthan 1944 - Justice party renamed as Dravida kazhagam - Emergence of young leaders in Dravida kazhagam - C.N. Annadurai - WPA Soundrapandian - Indian Independence and D.K's stand in 1947.

Reference Books:

1. Nambi Aroran K - Tamil Renaissance and Dravidian Nationalism
2. Sivagananam. M.P - Viduthalai Poril Taulagam (in Tamil) (Two parts)
3. Stalin Gunsekaran .T - Viduthalai Velviul Taulagam (in tamil) (Two parts)
4. Pavathravathy - Dravida Jyakka Vavalaru (in Tamil)
5. Devanandan . P.D. - The Dravida Kashagam. A revolt against Movement
7. Grschick Eugene.F - Tamil Vevivalidur in 1930's
8. E.S.K . Viswanathan - The Political career of E.V.R
9. Sami Chidambaranan - Tamil Thalaivar (in Tamil)

SEMESTER VI

ELECTIVE

PAPER - 2

C. HISTORY OF THE ARABS FROM A.D.750 TO A.D.1258

UNIT-I:

Rise of the Abbasids – Abdul Abbas As - saffah, Al-Mansur – Harun – Al – Rashid – Al-Mamoon.

UNIT-II:

Social, Economic, Religious and Cultural condition of the people under Abbasids – Development of Language literature, Philosophy – Science, Fine arts and architecture – Administration – Downfall.

UNIT-III:

Fathimids of Egypt – Ubaidullah - Al-Mahadhi – Al-Mansur – Al-Muiz – Al-Azeez – Fall of Fathimids – Socio – Intellectual life, Arts and Learning under Fathimids.

UNIT-IV:

The Crusades – Causes – Results and their impact.

UNIT-V:

Moorish Spain – Abdur Rahman III – his contribution – influence of Moorish civilization on Europe.

Reference Books:

1. P.K. Hitti: History of Arabs, The Macmillan press Ltd, London-1970.
2. Syed Amir Ali: A short history of Saracens, Kitab Bhavan, New Delhi 2, 1981.
3. S.A.Q, Hussaini Arab Administration, Iddabah - I – Adabiyat, 1976, Delhi.
4. Syed Mahmudum : Islam, its concept and history Kitab Bhavan, 1981, New Delhi.
5. S. Khuda Baksh: The Orient under the calips, Idarah – I – Adabiyat 1983, Delhi.

SEMESTER – VI
ELECTIVE PAPER - 2

D. HISTORY OF RUSSIA FROM EARLY TIMES TO A.D.1917

UNIT-I

Early History - Rise of Kiev and Moscow - The Rule of Michael Romanov.

UNIT-II

Russia in the 17th Century - Peter the great and Catherine the great - Russia in the Napoleonic struggle and after.

UNIT-III

Alexander I - Nicholas I - Alexander II - the conquest of central Asia - Russia and the Eastern question.

UNIT-IV

Decline of liberalism - Alexander III

UNIT-V

Nicholas II - Russo Japanese war - Russia and the First World War.

Reference Books:

1. Basil Dmytryshyn : History of Russia Prentice Hall of India {P} Ltd New Delhi - 1981.
2. Geoffrey Hosking : A History of Soviet Union Fontana Press -1985 /
3. Leonid I Brezhnev : Socialism, peace the freedom and-independence of the peoples. Allied' publishers {P} Ltd Madras-1982.
4. Modak A.G. : Economic Development of the U.S.S.R. Himalaya Publishing House Bombay-1982.
5. Gokhale. B.K. : History of the Modern World. 1900-1960 Himalayan Publishing House Bombay - 1982.
6. Vladimir Poletayev, Valentine & Mironov Leonora Rutes : A Short History of the USSR Sterling Publishes {P} Ltd., 1976.

SEMESTER VI

ELECTIVE

PAPER - 3

A. HISTORY OF SCIENCE AND TECHNOLOGY SINCE A.D.1900

UNIT-I

Introduction - Contribution of Europeans to - Asiatic society of Bengal - Indian Science - Scientific Education - Scientific survey and research Organization for the promotion of Science - Indian Government Policies for promotion of Science - Indian Scientists.

UNIT-II

Agriculture - Agricultural Education and Research - Veterinary Science - Food crops - Commercial crops - cash crops - sugarcane - cotton - Tea - Coffee - Rubber - oil seeds - plantation crops - Irrigation - Types of Irrigation - Irrigational schemes.

UNIT-III

Transport and Communication - Roads and Bridges – Harbours- Ports - Light houses - water ways - Railways 1st - Telegraph and Telephones - Automative and Aeronautical Industry - Space Research and Satellites - Insat systems. Medical science - pharmacy and Health science.

UNIT-IV

Industry - Cottage Industries - Handloom Industry - Textile Industries - Iron and steel. Industry - Energy - Types of Energy and Generation - Atomic and nuclear research - Software and Information Technology.

UNIT-V

Impact - Political implications - Social and cultural conservancy - Brain drain - Reasons for Backwardness in Comparison to Super Powers - WTO - ecological hazards - G7 and G20.

Reference Books:

1. S.P. Gupta, Modern India and Progress in Science and Technology.
2. Dr. R. Venkatraman. History of Science and Technology.
3. S. Varghese Jayarajm, History of Science and Technology.
4. Dr. Kuppuram and Kumudamani : History of Science and Technology 12 volumes.
5. O.P Jeggi : History of Science and Technology.
6. P.S. Joshi and K. Vajreshwar : Science Scientific Method Technology and developments.
7. S.V. Sen, R.C. Majumdhar, B.V. Subrayappa : A concise History of Science in India.

SEMESTER VI

ELECTIVE

PAPER -3

B. DRAVIDIAN MOVEMENT IN TAMIL NADU SINCE A.D.1947

UNIT-I

Meeting of Rajaji and Periyar 1949 - Split in Dravida Kazhagam and the birth of DMK - Young dynamic followers of C.N. Annadurai - New style in press - stage - film worlds - struggle of DMK - 1952 Elections - 1954 Bye election and support to Kamaraj - Kallakudi - Thiruttani - Devikulam Peermedu struggle - 1957 entry into election and 15 MLAs.

UNIT-II

1962 Elections - 50 MLAs - Good growth - Indo Chinese war - Defence of India Rules - Abandoning of separate Dravida Nadu demands - Anti Hindi and Anti price rise agitations - large scale unrest - 1964 - 65, 1967 - Elections - New Alliance formula of seat adjustment - DMK won and C.N. Annadurai became CM.

UNIT-III

The Administration and death of C.N. Annadurai - succession crisis and M. Karunanidhi becomes CM - various welfare measures - development activities - Congress split and DMK's support to Congress - I. Demand for state Autonomy - 1971 Elections - continuance of Alliance - M.G.Ramachandran and split in DMK - Birth of ADMK - Emergency and after math in Tamil Nadu.

UNIT-IV

Alliance Politics in Tamil Nadu - M.G.Ramachandran first ADMK Govt. 1977 - 80 - 1980 - 84 and 1984 - 88. Welfare measures and development activities of ADMK - Srilankan issue and political changes in Tamil Nadu - Death of M.G.Ramachandran 1987 and split in ADMK - return of ADMK to - administration 1989 - 91.

UNIT-V

Rajiv Gandhi's Assassination and Political changes 1991 - Ms. J. Jayalalitha as CM - References of welfare activities - charges and criticism - 1996 - Return of M. Karunanidhi as CM for the fourth time - Changed affiliations and alliance - Tamil Nadu under development path - soft ware - IT and Tamil Nadu.

Reference Books:

1. Hard Grave, R: The Dravidian movement, Popular Prakasam, Bambay, 1965.
2. Subramanian, N. : Social and Cultural History of Tamil Nadu, AD. 1336 – AD. 1994, Ennes Publications, Udumalpet, 1999.
1. 3.Thandavan, R. : All India Anna Dravida Munnetra Kazhagam, Tamil Nadu Academy of Political Science, Madras University, 1987.
3. Spratt, P. : DMK in power, Nichiketa publication Ltd, Bombay, 1970.

SEMESTER VI

ELECTIVE

PAPER -3

C. AN INTRODUCTION TO MUSEOLOGY

UNIT-I

Museology Definition - Objectives - History of Museum - Museum Architecture and Buildings.

UNIT-II

Kinds of Museum - Classification - National - Regional State - District - Site - Private Museums.

UNIT-III

Functions of Museum - Storage - Conservation - Preservation Techniques - Education - Research.

UNIT-IV

Museum - Administration - Security - Museum Library - Legislative measures - Reproduction of Museum objects.

UNIT-V

Museum related organizations - International - Indian Museums in the promotion of Tourism - study of select Museums in India - National Museum Delhi, Government Museum Chennai - Salar Jung Museum Hyderabad - Local Museum Vellore.

Reference Books:

1. Dr. V. Jayaraj - Museology - Heritage Management - Seawaves Printers, Chennai - 86, 2005
2. M.L. Nigam - Fundamentals of Museology, Deva Publications, Hyderabad, 1985
3. Grace Morley - The Museum and its functions, Ed. Saifur Rahman dar, Lahore Museum, Lahore, 1981
4. Dr. V. Jayaraj - Handbook on Conservation in Museums Published by the Commissioner of Museums, Chennai, 1995
5. J. Smifa, J. Baxi and Vinod P. Dwivedi - Museum Storage, Modern Museum, V.P. Abhinav Publications, New Delhi, 1985
6. Baverjee. N.R. - Museum and cultural Heritage in India Agam Kala prakashan, New Delhi, 1990
7. Agarwala. V.S. - Museum studies, Prithivi Prakashan, Varanashi, 1978
8. Grace Morley - Museum today, Lucknow, 1981
9. Agarwal. O.P. - Care and Preservations of Museum Objects, 1980
10. H. Sarkar - Museum and Museology, Sundeepr Prakashan, New Delhi, 1981

SEMESTER VI
ELECTIVE
PAPER -3
D. ARCHAEOLOGY – II

Objectives:

The Study of Archaeology through Epigraphy, Numismatics, Excavation and Monuments helps to understand the history of ancient period. It is a base to graduates to understand the source materials.

UNIT – I:

Epigraphy – Its importance – Brahmi Script – Paleography Languages and Types of Inscriptions with Special Reference to South India

UNIT – II:

Numismatics – Its Illustration – Coins of Guptas, Cholas, Pandyas and Vijayanagara Rulers

UNIT – III:

Art and Architecture of Pallavas, Cholas. Vijayanagar and Nayaks

UNIT – IV:

Monuments: Its Importance – South Indian Monuments

UNIT – V:

Iconography – Paintings – Cave temple and Wall Paintings

Reference Books :

4. 1.Ekambaranathan,A : Principles and Methods of Archaeological Excavation and Ponnuswamy Aranga (in Tamil) (Third Ed.) Kulamangalam Publishers, Chennai 2002.
2. Gurumurthy, S: Cera, C Traditions in South India, University of Madras, 1981.
3. Magalingam T.V.: Early South Indian Paleography, Madras University, Chennai, 1967.
4. Narasimman.B : Neolithic Culture in Tamil Nadu, Sundeep Publication, New Delhi, 1980.
5. Ramachandran K.S.: A Bibliography of Indian Megalithics, The State Department of Archaeology, Tamil Nadu, 1971.
6. Dr. Raman.K.V. Principles and Methods of Archaeology, Parthajan Publication, Chennai, 1988.
7. Rao.S.R. : Lothal and the Indus Civilizations, Asia Publishing House, Bombay, 1973
8. Dr. Venkataraman.R.: Indian Archaeology – A Survey, Ennes publications, Udumalpet, 1999.

SEMESTER VI
SKILL BASED SUBJECT
PAPER - 4

GROWTH OF PANCHAYAT INSTITUTIONS IN TAMIL NADU

UNIT-I

Introduction, Definition of a Local administration - Village Accusatives during Sangam Age - Mandram - Ambalam and other institutions during Chera - Chola - Pandiya - Administration.

UNIT-II

Village administration under the Pallavas - Uthiramerur inscription - Kudavolai system - Election system in the village assemblies during Chola and Pandiya period.

UNIT-III

Village administration under the Vijayanagar - Nayaks - Marathas Sultans - Nawabs of Arcot and Poligars.

UNIT-IV

Village administration under the British - East India Company - Ryotwari system - Govt. of India under the British Crown - Lord Ripons resolution of 1882. Formation of Taluk Boards - Panchayat - Amendments till 1947.

UNIT-V

Village Administration after independence - Panchayat blocks - Three tier system of panchayat - Block and district National Extension service - community development programme - Rajiv Gandhi - Panchayati Raj Act - constitutional Amendment. No.73

Reference Books:

- | | | | |
|---|---|---|---|
| 1 | Pillay K.K | - | History of Local self Government in Tamil Nadu |
| 2 | Saraswathi S. | - | Development of Rural Administration in Tamil Nadu |
| 3 | Venkata Rao R. | - | History of local self Government in the Madras Presidency |
| 4 | Palanidurai S. | - | Power to the powerless, A study on panchayat Raj Act. |
| 5 | Palanidurai S. | - | The New Panchayat Raj Act |
| 6 | State Institute for Panchayat administration, Govt. of Tamil Nadu | - | A Review A Manual for panchayat Administration in Tamil Nadu |

THIRUVALLUVAR UNIVERSITY
BACHELOR OF BUSINESS ADMINISTRATION
DEGREE COURSE
CBCS PATTERN

(With effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

| S. No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|------------------|---------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 4 | Principles of Management | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper-2 | 4 | 3 | Business Mathematics & Statistics I | 25 | 75 | 100 |
| 5 | III | ALLIED -1 | Paper-1 | 6 | 4 | (to choose any 1 out of 3) A. Business Organization B. Principles of Insurance C .Business Ethics | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Science | 25 | 75 | 100 |
| | | | | 30 | 21 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-3 | 6 | 4 | Financial Accounting | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-4 | 4 | 3 | Business Mathematics & Statistics II | 25 | 75 | 100 |
| 11 | III | ALLIED-1 | Paper-2 | 6 | 6 | (to choose any 1 out of 3) A. Business Communication B. Principles of Banking System C. Fundamentals of Computer | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 24 | | 175 | 525 | 700 |
| | | | | | | | | | |
| | | | | | | | | | |

| S. No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------|----------|----------------|--------|--|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | III | Core Theory | Paper-5 | 5 | 4 | Production Management | 25 | 75 | 100 |
| 15 | III | Core Theory | Paper-6 | 5 | 4 | Management Accounting I | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-7 | 5 | 4 | Strategic Management | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-8 | 4 | 3 | Managerial Economics | 25 | 75 | 100 |
| 18 | III | ALLIED-2 | Paper-3 | 6 | 4 | (to choose any 1 out of 3) A. Office Management B. Service Marketing C. Tourism Management | 25 | 75 | 100 |
| 19 | IV | Skill based Subject | Paper-1 | 3 | 3 | Customer Relationship Management | 25 | 75 | 100 |
| 20 | IV | Non-major elective | Paper-1 | 2 | 2 | Management Concepts | 25 | 75 | 100 |
| | | | | 30 | 24 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 21 | III | Core Theory | Paper-9 | 5 | 4 | Materials Management | 25 | 75 | 100 |
| 22 | III | Core Theory | Paper-10 | 5 | 4 | Management Accounting II | 25 | 75 | 100 |
| 23 | III | Core Theory | Papr-11 | 5 | 3 | Business Environment | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper 12 | 4 | 3 | Operations Research | 25 | 75 | 100 |
| 25 | III | ALLIED-2 | Paper-4 | 6 | 6 | (to choose any 1 out of 3) A. Organizational Behavior B. Project Management C. Hotel Management | 25 | 75 | 100 |
| 26 | IV | Skill based Subject | Paper-2 | 3 | 3 | Total Quality Management | 25 | 75 | 100 |
| 27 | IV | Non-major elective | Paper-2 | 2 | 2 | Training and Development | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 28 | III | Core Theory | Paper-13 | 6 | 4 | Marketing Management | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-14 | 6 | 4 | Business Law | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper-15 | 5 | 4 | Cost Accounting | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper-16 | 5 | 4 | Computer Application in Business | 25 | 75 | 100 |
| 32 | III | Elective | Paper-1 | 5 | 3 | (To choose any 1 out of 3) A. Human Resource Management B. Reward Management | 25 | 75 | 100 |

| S. No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|----------------------|----------|----------------|--------|--|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| | | | | | | C. Change Management | | | |
| 33 | IV | Skill based Subject | Paper-3 | 3 | 3 | E-Business | 25 | 75 | 100 |
| | | | | 30 | 22 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 34 | III | Core Theory | Paper-17 | 6 | 4 | Industrial Relations and Labour Laws | 25 | 75 | 100 |
| 35 | III | Core Theory | Paper-18 | 5 | 4 | Entrepreneurial Development | 25 | 75 | 100 |
| 36 | III | Core | Paper-19 | 6 | 6 | Group Project *Viva-Voce ** Project Report | 25* | 75** | 100 |
| 37 | III | Elective | Paper-2 | 5 | 3 | (to choose any 1 out of 3) A. Financial Management B. Financial Services C. Investment Management | 25 | 75 | 100 |
| 38 | III | Elective | Paper-3 | 5 | 3 | (to choose any 1 out of 3) A. Marketing Research B. Rural Marketing Management C. Export Management | 25 | 75 | 100 |
| 39 | IV | Skill based Subject | Paper-4 | 3 | 3 | Creativity and Innovation Management | 25 | 75 | 100 |
| 40 | V | Extension Activities | | 0 | 1 | Extension Activities | 100 | 0 | 100 |
| | | Total | | 30 | 24 | | 150 | 450 | 700 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 2 | 4 | 8 | 100 | 200 |
| Part II | English | 2 | 4 | 8 | 100 | 200 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 19 | (3-7) | 73 | 100 | 1900 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft Skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

THIRUVALLUVAR UNIVERSITY
BACHELOR OF BUSINESS ADMINISTRATION
SYLLABUS
UNDER CBCS
(With effect from 2017- 2018)
SEMESTER I
PAPER – 1
PRINCIPLES OF MANAGEMENT

Objective:

To enable the students understand the principles of management and how to acquire skill to become a good Manager.

UNIT-I

Management - Importance - Definition - Nature and Scope of Management - Process - Role and function of a Manager - Levels of Management – Management as an Art or Science - Management as a Profession - Contributions of Henry Fayol and F W Taylor to Management.

UNIT-II

Planning - Nature - Importance - Types - Steps in Planning -Objectives - Policies - Procedures - and Methods - Decision making - Process of decision making - Types of decision.

UNIT-III

Organizing - Types of Organization structure - Span of Control - Departmentation - Informal Organization.

UNIT-IV

Authority - Delegation - Decentralization - Difference between authority and power - Uses of authority - Staffing - Sources of recruitment - Selection process - Training - Directing - Nature and purpose of Directing – Motivation (Maslow’ s need hierarchy Theory only).

UNIT-V

Co-ordination - Need of co-ordination - Types - Techniques - Distinction between Co-ordination and Co-operation - Controlling - Meaning and importance of Controls - Control Process.

Text Books:

1. Sundar K ,principles of Management ,Vijay Nicole Imprints (P) Ltd.
2. Dr. C.D.Balaji, Principles of Management, Margham Publications.
3. P.C. Tripathi & P.N. Reddy , Principles of Management , Tata McGraw-Hill
4. J. Jayasankar , Principles of Management ,Margham Publications.
5. R.N. Gupta , Principles of Management , S.Chand &Co..
6. R.K.Sharma and Shashi K Gupta ,Principles of Management ,Kalyani Publishers.
7. T.Ramasamy ,Principles of Management ,Himalaya Publishing House

Books for Reference:

1. Hanagan , Management Concepts & Practices , MacMillan India Ltd.
2. Dr. N. Perma , Business Management.
3. Prasad L.M. , Principles and Practice of Management
4. Guptha CB , Business Management
5. Peter F. Drucker , Practice of Management
6. Harold Koontz, Aryasri & Heniz Weirich , Principles of Management - Tata McGraw-Hill
7. Stoner, Freeman & Gilbert Jr –Management –Prentice Hall of India.

PAPER – 2

BUSINESS MATHEMATICS AND STATISTICS – I

Objectives:

To apply the concepts of Statistics and Mathematics in Business.

UNIT-I

Statistics - Definition - Scope and Limitation - Presentation of Data - Diagrammatic and Graphical Representation of Data.

UNIT-II

Measures of Central Tendency - Mean - Median and Mode - GM and HM

UNIT-III

Measures of Dispersion - Range - Mean Deviation - Quartile Deviation - Standard Deviation - Coefficient Variation .

UNIT-IV

Mathematics for Finance - Simple and Compound Interest - Annuities - Discounts and Present values.

UNIT-V

Basic Calculus - Rules for Differentiation.

Note: The proportion between theory and problems shall be 20:80

Text Books:

1. P.R. Vittal , Business Statistics and Mathematics, Margham Publications.
2. S P Rajagopalan and R Sattanathan , Business Mathematics , Vijay Nicole Imprints (P) Ltd
3. S P Rajagoalan and R Sattanathan , Buiness Statistics-Vijay Nicole Imprints (P)Ltd.

Books for Reference:

1. J.K. Sharma , Business Statistics , Pearson Publications
2. P. Navaneetham , Business Statistics and Mathematics
3. S P Gupta , Statistical Methods, Sultan Chand & Sons
4. S G Gupta and V K Kapoor , Fundamentals of Applied Statistics , Sultan Chand & Sons

ALLIED – 1
(to choose any 1 out of three)
PAPER - 1
A. BUSINESS ORGANIZATION

Objective:

The course aims to provide the basic concept and knowledge with regard to business enterprises and its functional areas.

UNIT-I

Business - Meaning - Types of Business and Profession - Organization - Meaning and Importance of Business Organization.

UNIT-II

Forms of Business Organization - Sole Trader, Partnership - Joint Hindu Family System - Joint Stock Companies - Co-operative Societies - Public Utilities and Public Enterprises.

UNIT-III

Location of Industry - Factors influencing location and size - Industrial Estates and District Industries Centre.

UNIT-IV

Stock Exchange - Functions - Working - Services - Regulations of Stock Exchange in India, Business combinations - Causes - Types - Effects.

UNIT-V

Trade Associations and Chamber of Commerce –Objectives - Functions – Differences between Trade Association and Chamber of Commerce.

Text Books:

1. Sundar K, Business Organisation, Vijay Nicole Imprints Pvt. Ltd.
2. G. Prasad, C.D. Balaji , Business Organization, Margham Publications.
3. Tapas Ranjan Saha, Business Organisation and Management , Vijay Nicole Imprints
4. Gupta C B –Modern Business Organisation
5. Vasudevan and Radhaswami , Business Organization

Books for Reference:

1. Bhusan Y. K , Business Organization.
2. Prakesh Jagadeesh , Business Organization and Management.
3. Reddy P. N. and Gulshan S , Principles of Business Organization and Management.
4. Chabra T N , Business Organisation.
5. M C. Shukla , Business Organization & Management

ALLIED – 1
PAPER – 1
B.PRINCIPLES OF INSURANCE

Objective:

The main objective of this subject is to make the students familiar with risk, insurance and types of insurance.

UNIT-I

Definition of insurance - classification of Contracts of Insurance - Marine and Non-Marine - General principles of law as applied to non-marine insurance.

UNIT-II

Life Assurance - objectives of Life Assurance - principles of Life Assurance - different plans of Life Assurance and annuities - policy condition and privilege - assignment and nomination - lapses and revivals - surrender values and loans - claims - double insurance.

UNIT-III

Marine Insurance - principles of marine insurance - functions of marine insurance - proximate clause - subrogation and contribution

UNIT-IV

Types of marine policy - clauses in general use - warranties - kinds of marine losses - reinsurance and double insurance.

UNIT-V

Fire insurance - principles of law as applied to fire insurance - the subject matter of fire insurance - fire waste - hazard types of fire policy - cover notes - surveys and inspection average - re-insurance - renewals.

Text Books:

1. Periasamy P – Fundamentals of Insurance –Vijay Nicole Imprints (P) Ltd.
2. Dr. A. Murthy, Elements of Insurance – Margham Publications
3. Dr. A. Murthy-Principles and Practice of Insurance, Margham Publications
4. Gupta P K – Insurance and Risk Management – Himalaya Publishing House
5. Mishra M N – Principles and Practice of Insurance – S Chand & Co
6. Panda G S –Principles and Practice of Insurance –Kalyani Publishers.

Books for Reference:

1. Dr. B. Vardharajan - Insurance Vol 1 and 2. - Tamil Text Book.
2. R.S. Sharma - Insurance Principle & Practice - Vara Bombay, 2006.
3. A Murthy - Elements of Insurance Risk management & Insurance - Harrington, 2006 - Tata McGraw Hill pub.

ALLIED - 1

PAPER – 1

C. BUSINESS ETHICS

Objective:

The objective is to provide basic knowledge of business ethics and values and its relevance in modern context.

UNIT-I

Role and importance of Business Ethics and Values in Business - Definition of Business Ethics Impact on Business Policy and Business Strategy - Role of CEO - Impact on the Business Culture.

UNIT-II

Types of Ethical issues - Bribes - Coercion - Deception - Theft - Unfair Discrimination.

UNIT-III

Ethics internal - Hiring - Employees - Promotions - Discipline - Wages - Job Description - Exploitation of employees.

UNIT-IV

Ethics External - Consumers - Fair Prices - False Claim Advertisements. Environment Protection - Natural - Physical - Society - Relationship of Values and Ethics - Indian Ethos - Impact on the performance.

UNIT-V

Social Responsibilities of Business towards Shareholders, Employees, Customers, Dealers, Vendors , Government - Social Audit.

Text Books:

1. Memoria & Menoria , Business Policy
2. Dr.S. Shankaran , Business Ethics & values, Margham Publications
3. Bodi R and Bodi N V , Business Ethics

Books for Reference:

1. David J. Fritzsche , Business Ethics: A Global & Management Perspective , Tata McGraw-Hill
2. Ramaswamy Namakumari - Strategic Planning - Corporate Strategy , Laxmi Publications Pvt. Ltd.
3. Velasquez - Business Ethics , Prentice - Hall of India
4. Peter Madsen & Jay M. Shafritz , Essential of Business Ethics
5. Ken Smith and Phil Johnson , Business Ethics and Business Behavior.
6. Pratley - Essence of Business Ethics , Prentice - Hall of India.

SEMESTER II

PAPER – 3

FINANCIAL ACCOUNTING

Objective:

The primary objective of the course is to familiar the students with basic accounting principles and techniques of preparing and presenting of accounts for user of accounting information.

UNIT-I

Accounting Concepts - Conventions - Objectives of accounting - Rules -Principles of Double Entry System - Journal - Ledger - Subsidiary Books - Purchases Book, Sales Book, Returns Book and Cash Books.

UNIT-II

Trial Balance - Depreciation - Need for depreciation - Straight Line and WDV Methods of Charging Depreciation only.

UNIT-III

Preparation of Trading, Profit and Loss Account and Balance Sheet.

UNIT-IV

Accounting from incomplete records-Meaning –Features –Limitations –Differences between Single Entry System and Double Entry System – Net Worth Method only.

UNIT-V

Company Accounts - Shares - Issue, Forfeiture and Re-issue .

Note: The proportion between Theory and Problems shall be 20:80

Text Books:

1. Reddy & Murthy - Financial Accounting, Margham Publications
2. Grewal. T.S - Introduction to Financial Accounting
3. Jain.S.P- Introduction to Financial Accounting, Kalyani Publishers
4. Murugados, Jaya, Charulatha –Financial Accounting –Vijay Nicole Imprints
5. S. Ganeson & S.R. Kalavathi - Financial Accounting.
6. R.L Gupta & V K Gupta – Financial Accounting

Books for Reference:

1. Gupta R.L and Radhaswamy - Advanced Accounting.
2. Shukla. M.C & Grewal .T.S- Advanced Accounting.
3. Tulsian - Financial Accounting - Tata McGraw-Hill Pub.
4. N. Vinayakam & B. Charrumathi - Financial Accounting
5. Bhattacharya- Financial Accounting for Business managers

PAPER – 4

BUSINESS MATHEMATICS AND STATISTICS II

Objectives:

To apply the concepts of Statistics and Mathematics in Business.

To expose Statistical Techniques for business data analysis

To understand the Matrix Applications.

UNIT-I

Matrix Theory - Operations on Determinants - Inverse of a Square Matrix (not more than 3rd order).

UNIT-II

Solving Simultaneous Equations using Matrix Method.

UNIT-III

Correlation . Karl Pearson's Correlation - Concurrent Deviation Method - Rank Correlation - Uses of Correlation in Business Regression - Regression Lines - Regression Coefficients - Uses of Regression in Business Problems.

UNIT-IV

Time Series - Components of time Series - Measurement of Trend - Semi Average method - Moving Average method - Method of Least Squares - Measurement of Seasonal Variations - Simple Average Method - Ratio to Moving Average Method.

UNIT-V

Index Numbers - Weighted and UN weighted Index Numbers - Cost of Living Index Number - Test on index Numbers.

Note : The proportion between theory and problems shall be 20 : 80

Text Books:

1. P.R. Vittal - Business Statistics and Mathematics, Margham Publications
2. S P Rajagopalan and R Sattanathan –Business Mathematics –Vijay Nicole Imprints (P) Ltd
3. S P Rajagopalan and R Sattanathan –Business Statistics-Vijay Nicole Imprints (P) Ltd.

Books for Reference:

1. J.K. Sharma - Business Statistics - Pearson Publications
2. P. Navaneetham - Business Statistics and Mathematics S P Gupta –Statistical Methods-Sultan Chand & Sons
3. S G Gupta and V K Kapoor –Fundamentals of Applied Statistics –Sultan Chand & Sons

ALLIED – 1

(to choose any 1 out of 3)

PAPER – 2

A. BUSINESS COMMUNICATION

Objective:

To enable the students understand the significance of communication particularly in the field of sales and its executions, claims and adjustments.

UNIT-I

Meaning and importance of Business Communication - Methods of Communication - Types of Communication - Communication Process - Objectives of Communication - Principles of Effective Communication.

UNIT-II

Business letters - Structure of a letter - Qualities of a good business letter - Business enquiries - Offer and Quotations - Orders - Execution of orders - Cancellation of orders - Letters of Complaints - Collection letters.

UNIT-III

Circular Letters - Bank correspondence - Insurance correspondence - Letters to the Editor - Application for Situations.

UNIT-IV

Correspondence of a Company Secretary - Preparation of Agenda and Minutes - Annual Reports.

UNIT-V

Communication media - Telephone, Telex, Fax, Internet, E-Mail, Video Conferencing and Cell Phones.

Text Books:

1. N.S. Raghunathan & B. Santhanam, Business Communication, Margham Publications
2. Rajendra Pal and Korlehalli - Essentials of Business Communication
3. Sundar K- Business Communication, Vijay Nicole Imprints (P) Ltd.,
4. Pillai and Bagawathi - Commercial correspondence and office management.
5. R.S.N. Pillai & Bagavathi - Modern Commercial Correspondence.
6. N.S. Pandurangan, B. Santhanam - Business Communication.

Books for Reference:

1. Ramesh M. S. Pattan Shetty - Effective Business English and Correspondence
2. Guffey - Essentials of Business Communication
3. Gart Side L. - Modern Business correspondence.
4. Mazumder - Commercial correspondence.
5. Lesikar & Pettit - Business Communication.
6. Sharma Mohan - Business correspondence and Report writing.
6. Devaraj and Antonysamy K S –Executive Communication

PAPER - 2

B. PRINCIPLES OF BANKING SYSTEM

Objectives:

To enlighten the students the functions of Modern Commercial Banks.

To provide the students with the latest development in the fields of Banking System.

UNIT-I

Introduction - Origin of Banks - Definition of Bank - Types of Bank - Banking Systems - Unit Bank - Merits of Unit Bank - Demerits of Unit Banks - Branch Bank - Its merits and demerits - Financial System - Components of financial system.

UNIT-II

Concept of Social Responsibility of Banks - Role of banks in Primary, Secondary and Territory sector - Mixed Banking - Retail Banking - Wholesale Banking - Universal Banking.

UNIT-III

Reserve bank of India (central bank) - Commercial Banks - Cooperative Banks - flow of cooperative funds - Urban Cooperative Bank - Land Development Banks - Development Bank - NABARD (National Bank for Agriculture and Rural Development) - Regional Rural Bank - EXIM bank

UNIT-IV

Functions of Modern Commercial Banks - Savings account - Current account - Difference between savings account and current account - Fixed Deposit - Recurring Deposit - Granting of Loan - Clean Loan - Second loan - Overdraft -Cash Credit.

UNIT-V

Factoring - Lease Finance - Export Finance - Credit Card - Credit Rating - E-business - E-commerce - E-banking - Automatic Teller Machines.

Text Books:

1. Santhanam -Banking and Financial System ,Margham Publications
2. Sundharam & Varshney- Banking Theory Law and Practice -
3. Gurusamy -Banking Theory Law and Practices — Vijay Nicole Imprints (P) Ltd.
4. S.N.Maheshwari -Banking Law Theory and Practice

Books for Reference:

1. Kandasami K P- Banking law and Practice
2. Varshney and Malhotra – principles of Banking – Sultan Chand & Sons

PAPER – 2

C. FUNDAMENTALS OF COMPUTER

Objectives:

To know the fundamentals of computers

To understand how to use computer application in day to day business.

UNIT-I

Introduction - Characteristics of computers – Five Generations of computers – Classification - Computer System - Uses of Computers .

UNIT-II

Computer Architecture - CPU - Memory - Communication between various units of a computer system - Storage Devices - Magnetic Tape - Magnetic Disk - Optical Disk - CD-ROM.

UNIT-III

Input Devices - Types - keyboard - Mouse - Output Devices - Classification of Output - Printers - Plotters - Monitors.

UNIT-IV

Computer program - Developing a Program - Algorithm - Flowchart Program Testing and Debugging - Program Documentation - Types of Documentation - Characteristics of a good program - Computer Languages - Software.

UNIT-V

Internet basics - Basic internet terms - Getting connected to internet - Internet applications - Electronic Mail - How e-mail works - Searching the Web - Internet and Viruses.

Text Books:

1. Alex Leon and Mathews Leon –Computer Application in Business – Vijay Nicole Imprints Ltd.,
2. Kritka Gupta, Sunil Chauhan, Akash Saxena – Fundamentals of Computer – Laxmi Publication Pvt. Ltd
3. Raja raman – Fundamentals of Computer – Prentice Hall of India
4. P K Sinha – Fundamentals of Computer-BPH Publication
5. Arora, Ashok and Bansal Shefali –Computer Fundamentals –Excell Booka

Reference Book:

1. Introduction to computer science, ITL Education solutions limited, Pearson education.

SEMESTER III

PAPER – 5

PRODUCTION MANAGEMENT

OBJECTIVES:

- 1. To enable the students to understand the various process of production*
- 2. To enable the students to be aware of techniques of Operations Management*
- 3. To familiarize students with quality control techniques used to effectively carry out Production.*

UNIT-I

Production System - Introduction - Production - Productivity - Production Management - Objectives of Production Management - Functions and scope of production management - Relationship of production with other functional areas.

UNIT-II

Production Planning and Control - Routing and Scheduling - Dispatching - Maintenance management - Types of maintenance - Breakdown - Preventive - Routine - Maintenance Scheduling.

UNIT-III

Plant Location - Introduction - Need for selecting a suitable location - Plant Location problem - Advantage of Urban, suburban and rural locations - Systems view of location - Factors influencing plant location.

Plant layout - Plant layout problem - Objectives - Principles of plant layout - Factors influencing plant layout - Types of layout.

UNIT-IV

Work and Method Study - Importance of work study - Work study procedures - Time study - Human considerations in work study - Introduction to method study - Objectives of method study - Steps involved in method study Work measurement - Objectives of work measurement - Techniques of work measurement - Computation of standard time - Allowance - Comparison of various techniques.

UNIT-V

Quality Control - Types of inspection - Centralized and Decentralized - P chart - X chart - Construction - Control - TQM.

Text Books:

1. Saravanavel P and Sumathi S - Production and Materials Management, Margham Publications.
2. Chunnawalla and Patel - Production and Materials Management.
3. Muhelmann Production and Operation Management MacMillan I Ltd.
4. Paneerselvam - Production and Operations Management - Prentice - Hall of India.
5. Martand T. Telsang - Production Management - S.Chand & Co.
6. Aswathappa, K – Production and Operations Management-Himalaya Publishers
7. Pradeep Kumar and Kedar Nath –Production Management –Prentice Hall of India

Books for Reference:

1. Harding HA - Production Management.
2. Buffa - Production Management.
3. Broom - Production Management.
4. Saxena JP –Production and Operations Management
5. SN Chari - Production and Operation Management.
6. Khanna OP - Industrial Engineering and Management.
7. Buffa and Sarin –Modern Production and operations Management
8. Adam and Ebert - Production and Operations Management - Prentice - Hall of India.

PAPER – 6

MANAGEMENT ACCOUNTING – I

Objective:

The objective of the course is to familiarize the students with basic management accounting concept and their application in managerial decision making.

Unit-I

Management Accounting – Definition - Objectives and functions – Advantages and limitations – Distinction between Financial Accounting and Management Accounting – Meaning of Financial statements - Tools of Financial Statement Analysis – Comparative Financial Statements – Common Size Financial Statements – Trend Percentages.

Unit-II

Ratio Analysis: Meaning - Definition – Significance - Limitations – Classification – Liquidity Ratios (Short Term Solvency Ratios) and Long term Solvency Ratios.

Unit-III

Ratio Analysis: Concept of ratio, Uses of Ratio – Turnover and Profitability Ratios.

Unit-IV

Fund Flow Analysis: Meaning - Definition – .Uses of Fund Flow Statement – Limitations of Fund Flow Statement – Preparation of Fund Flow Statement.

Unit –V

Cash flow Analysis: Meaning - Definition – .Uses of Cash Flow Statement – Limitations of Cash Flow statement –Distinction between Fund Flow Statement and Cash Flow Statement – Preparation of Cash Flow Statement.

(Weightage of Marks: Problems – 80%, Theory – 20%)

Text Books:

1. T.S. Reddy & Hari Prasad Reddy – Management Accounting – Margham Publications.
2. Murthy A and Gurusamy S – Management Accounting :Theory and Practice - Vijay Nicole Imprints Private Limited
3. Manmohan & Goyal – Management Accounting – Saithya Bhavan, Agra.
4. R.S. Pillai & Bhagavathi – Management Accounting – S. Chand & Co. Ltd, New Delhi.
5. S.N. Maheswarin – Management Accounting – Sultan Chand & Sons, New Delhi.

PAPER – 7

STRATEGIC MANAGEMENT

OBJECTIVES:

- 1. To enable students to understand basics of strategies adapted by business firms.*
- 2. To help students to understand the environmental factors affecting the management of Business.*
- 3. To familiarize them with the formulation, implementation & evaluation of strategies.*

UNIT-I

The business system - objectives of the business - setting up and balancing the objectives mission - vision - goals strategic analysis of functional areas production - marketing - human resources - finance - analyzing corporate capabilities.

UNIT-II

Corporate strategy - nature and scope - process of strategic planning - formulation of strategy - project life cycle - portfolio analysis – SWOT.

UNIT-III

Generic strategic alternatives - horizontal, vertical diversification - active and Passive alternatives.

UNIT-IV

External growth strategy - merger acquisition - amalgamation - joint venture - problems organizational structure and corporate development - line and staff function - evaluation of organization structure - management of change.

UNIT-V

Implementation of strategy - elements of strategy - leadership and organizational climate - planning and control of implementation.

Text Books:

1. Dr. C.B. Mamoria & Dr. Satish Mamoria, Business planning and policy (1987) Himalaya publishing house, Mumbai.
2. Dr. S.Sankaran –Strategic Management,Margham Publications
3. S.C. Bhattacharya - Strategic Management Concepts & cases - S.Chand & Co

Books for Reference:

1. Kazmi - Business policy & Strategic Management - Tata McGraw-Hill pub.
2. Azhar kazmi, Business Policy.

PAPER – 8

MANAGERIAL ECONOMICS

Objective:

To acquaint the students with principles of economics in managerial decision making.

UNIT-I

Nature and Scope of Managerial Economics - Definition of Economics - Important concept of Economics - Basic Economic problem - Relationship between Micro and Macro economics - Managerial Economics - Nature and Scope - Objectives of the Firm.

UNIT-II

Theory of Consumer behavior - Managerial Utility Analysis indifference curve and analysis Meaning of Demand - Law of Demand - Types of Demand - Determinants of demand - Elasticity of Demand - Demand Forecasting.

UNIT-III

Production and Cost Analysis - Law of returns to scale and Economies of scale - Cost analysis - different cost concepts - Cost - output relationship - Short run and long run - Revenue curves of firms - Supply Analysis.

UNIT-IV

Pricing Methods and Strategies - Objectives - Factors - General Considerations of Pricing - Methods of pricing - Role of Government - Dual pricing - price Discrimination.

UNIT-V

Market forms - Market structure - Basis of Market classification - Output determination - Perfect Competition - Monopoly - Monopolistic Competition - Duopoly - Oligopoly.

Text Books:

1. Dr. S. Sankaran – Managerial Economics –Margham Publication
2. Aryamala T – Managerial Economics – Vijay Nicole Imprints Private Limited
3. Mankar: Business Economics, Macmilan Ltd.,
4. Varshney RL and Maheshwari KL - Managerial Economics.
5. Yogesh Maheshwari - Managerial Economics - Prentice-Hall of India.
6. Gupta GS - Managerial Economics.
7. Jinghan M.L. - Micro Economics, Vrinda Publications (P) Ltd. (Theory).

Books for Reference:

1. Dean - Managerial economics - Prentice-Hall of India.
2. Peterson - Managerial Economics - Prentice-Hall of India.
3. Mote Paul Gupta - Managerial Economics – MGH.
4. Mehta P.L. - Managerial Economics.
5. Dr. Shivani Kapoor, prof. O Shukla – Managerial Economics – Laxmi Publication Pvt. Ltd

ALLIED -2

(to choose any 1 out of 3)

PAPER – 3

A. OFFICE MANAGEMENT

Objective:

To enable students to understand management of office, methods, environment and procedures.

UNIT-I

Office - Meaning and scope – Office Functions - Qualifications of Office Manager – Office Management – Definition – Elements of Office Management – Functions of Office Management.

UNIT-II

Location of an Office – Office Accommodation – Office Layout –Office Environment.

UNIT-III

Office Furniture – Factors considered in selecting office furniture – Types of office furniture – Office Appliances and Equipments –Importance – Merits and Demerits - Typewriter - Duplicators - Photo Copier - Franking Machine - Communication Equipments : Dictaphone - Intercom - Telephone - Telex - Fax - PABX - PBX - Uses of Computers in Office .

UNIT-IV

Mail service – Handling Inward Mail Service – Handling Outward Mail Service - Communications –Internal and external communication – Mechanical Devices for Oral Communication - Mechanical Devices for written Communication – Office Forms – Principles of Forms Design – Form Control – Continuous Stationery.

UNIT-V

Records Management – Objectives – Filing –Definition –Essentials of a good filing system – Centralised and Decentralised Filing System –Methods of Filing –Classification of Files – Indexing –Definition – Types.

Text Books:

- 1.V.Balachandran and V.Chandrasekaran –Office Management – Vijay Nicole Imprints private Limited.
2. N.S, Raghunathan – Office Management – Margham Publications
3. P.k.Ghosh – Office Management –Sultan Chand & Sons.
4. C.B.Gupta – Office Organisation and Management, Sultan Chand & Sons.
5. Pillai R.S.N, Bhagwathi. V - Office Management

Books for Reference :

1. Denyer JC - Office Management.
2. Littlefield CL and Peterson RL - Modern Office Management.
3. Leffingonnell - Office Management.
4. Chopra PK - Office Management
5. Arora SP - Office Management
6. Dr.T.S. Devanarayan, N.S.Raghunathan - Office Management

PAPER – 3

B. SERVICES MARKETING

Objective:

To familiarize the concept of services marketing, fundamentals, tools, techniques and its significance in liberalized environment.

UNIT- I: MARKETING SERVICES

Introduction Growth of the service sector. The concept of services. Characteristics of services - classification of services - designing of the service - blueprinting, using technology developing, human resources, building service aspirations.

UNIT- II: MARKETING MIX IN SERVICE MARKETING

The seven Ps: Product decision, pricing, strategies and tactics, promotion of services and placing or distribution methods for services. Additional dimension in services marketing - people, physical evidence and process.

UNIT- III: EFFECTIVE MANAGEMENT OF SERVICE MARKETING

Marketing demand and supply through capacity planning and segmentation - internal marketing of services - external versus internal orientation of service strategy.

UNIT- IV: DELIVERING QUALITY SERVICES

The customer expectations versus perceived service gap. Factors and techniques to resolve this gap. Gaps in services - quality standards, factors and solutions - the service performance gap - key factors and strategies for closing the gap. External communication to the customers - the promise versus delivery gap - developing appropriate and effective communication about service quality.

UNIT- V: MARKETING OF SERVICES

Marketing of services – Financial – Health – Hospitality – Educational Services.

Text Books:

1. Services Marketing - Dr. L. Natarajan, Margham Publications.
2. Services Marketing & Management - Balaji. B - S.Chand.
3. Valerie Zeithaml - Service Marketing - Tata McGraw-Hill Pub.

Books for Reference:

1. Service Marketing. The Indian experience- by Ravi Sankar, Manas Publications, New Delhi.
2. Delivering Quality Services - Zeithaml Parasuraman and Berry. The free press Macmillia.
3. Excellence in services - S. Balachandran, Business Publishing House, Bombay.
4. Marketing of Non Profit Organization by Philip Kotler. Printice Hall of India (P) Ltd. India New Delhi.

PAPER – 3

C. TOURISM MANAGEMENT

UNIT-I

Definition of tourism and the need for tourism. The birth, growth and development of tourism - factors influencing growth of tourism - tourism in India and abroad.

UNIT-II

Tourism - planning - need for planning - government's role in planning - tourism under five year plans. Tourism marketing - concepts and importance - marketing functions in tourism - tourist marketing mix.

UNIT-III

Tourism and culture - tourism and people: tourism and economic development - tourism and growth of related industry, tourism and employment.

UNIT-IV

Tourism pricing - methods of pricing - tourism promotion - advertising costs - steps in planning an advertising campaign - tourist publicity

UNIT-V

Tourism and government administrative systems - ministry of tourism - department of tourism - Indian tourism development corporation - world tourism organization - travel agents in India.

Text Books:

1. Anand M.M - Tourism and hotel industry in India
2. Clib SN - Perspectives of Indian Tourism in India
3. Pran Nath Seth Successful tourism management

Books for Reference:

1. Bukart A J -The management of tourism -
2. Butler R W The social implications of tourism development

SKILL BASED SUBJECT
PAPER – 1
CUSTOMER RELATIONSHIP MANAGEMENT

Objective:

The objective of this course is to enable the students to understand the importance of satisfying the customer in today's competitive world.

UNIT-I

CRM – Introduction – Definition – Need for CRM – Complementary Layers of CRM – Customer Satisfaction – Customer Loyalty – Product Marketing – Direct Marketing.

UNIT-II

Customer Learning Relationship – Key Stages of CRM – Forces Driving CRM – Benefits of CRM – Growth of CRM Market in India – Key Principles of CRM.

UNIT-III

CRM Program – Groundwork for Effective use of CRM – Information Requirement for an Effective use of CRM – Components of CRM – Types of CRM.

UNIT-IV

CRM Process Framework – Governance Process – Performance Evaluation Process.

UNIT-V

Use of Technology in CRM – Call Center Process – CRM Technology Tools – Implementation – Requirements Analysis – Selection of CRM Package – Reasons and Failure of CRM.

Text books:

1. Dr. P. Sheela Rani – Customer Relationship Management – Margham Publications.
2. G.Shainesh, Jagdish N Sheth – Customer Relationship Management – Laxmi Publication Pvt. Ltd.
3. K.Balasubramanian - Customer Relationship Management, , GIGO publication, 2005.

Books for Reference:

1. Dr.Ravi Kalakota E-business – Roadmap for success, , Pearson education Asia, 2000.
2. Rebecca Saunders - Business – The Dell way, India book distributors, 2000.
3. Amrit tiwana - The essentials guide to knowledge management – E-business and CRM application, , Pearson education, 2001.

NON-MAJOR ELECTIVE
PAPER – 1
MANAGEMENT CONCEPTS

Objectives:

To enable the students understand the Principles of Management and how to acquire skills to become a good manager.

UNIT-I

Management – Definition – Importance – Role and Functions of a Manager.

UNIT-II

Planning – Nature – Purpose – Steps – Types – Merits and Demerits of Planning – MBO.

UNIT-III

Organising – Purpose – Line and Staff Organisation – Committee Organisation - Departmentation – Span of Control – Delegation of Authority – Centralisation and Decentralisation of Authority

UNIT-IV

Directing – Leadership – Motivation – Communication - Process of Communication – Barriers of Communication.

UNIT-V

Controlling – Need and Importance – Control process – Co-ordination – Need – Principles – Approaches to achieve effective Co-ordination

Text Books:

1. Sundar - Principles of Management –Vijay Nicole Private Limited
2. Dr.C.D. Balaji –Principles of Management –Margham Publications

Books for Reference:

1. L.M.Prasad – Priniciples and Practice of Management – Margham Publication.
2. R.N.Gupta – Principles of Management - S.Chand & Co.

SEMESTER IV
PAPER – 9
MATERIALS MANAGEMENT

Objectives:

To make the students understand the decision making process in planning, purchasing materials and to understand the inventory control techniques.

UNIT-I

Materials – Meaning – Types - Materials Management - Definition and Functions - Importance of materials Management - Integrated materials management - The concept - advantages.

UNIT-II

Inventory control - Function of inventory - Importance - Replenishment stock - Material Demand Forecasting - Material Requirement Planning MRP - Basis - Tools of Inventory Control - ABC - VED - FSN analysis - Inventory control of spares and slow moving items - EOQ and EBQ etc - Stores planning.

UNIT-III

Purchase Management - Purchasing - Procedure - Dynamic purchasing - Principles - Import substitution - International Purchase - Import purchase Procedure.

UNIT-IV

Store Keeping and Materials Handling - Objectives - Function of store keeping - Store responsibilities - Location of store house - Centralized store room - Equipment - Security measures - Protection and prevention of stores - Fire and other Hazards – Bin card - Stock Cards.

UNIT-V

Vendor rating - Vendor development - Purchase Department - Responsibility - Buyer - Seller relationship - Value analysis - ISO – Types.

Text Books:

1. Saravanavel P and Sumathi S - Production and Materials Management , Margham Publications.
2. Chunnawalla and Patel - Production and Materials Management
3. Menon - Stores Management MacMillan

4. Paneerselvam - Production and Operations Management - Prentice - Hall of India
5. Gopalakrishnan - Materials Management - Prentice - Hall of India

Books for Reference:

1. Muhdnan - Production and Operation Management MacMillan
2. Dutta - Integrated Materials Management
3. Veb - Materials Management
4. England and Leenders - Purchasing and Materials Management
5. Varma - Materials Management

PAPER – 10

MANAGEMENT ACCOUNTING – II

OBJECTIVE:

To enable the students to know the nature and scope of management accounting and gain knowledge in marginal costing, budget and standard costing.

Unit-I

Budget and Budgetary Control: Definition – Objectives – Uses and Limitations – Preparation of Materials Purchase, Production, Sales, Cash and Flexible Budget – Zero Base Budgeting.

Unit-II

Capital Budgeting: Concepts – Nature – Advantages and Limitations – Ranking investment Proposals – Payback Period, ARR, NPV ,IRR .

Unit-III

Marginal costing: Definition – Advantages and Limitation – Marginal Cost Equations - Contribution - Cost-Volume-Profit Analysis – P/V Ratio – BEP – Margin of Safety.

Unit-IV

Application of Marginal Costing Techniques Cost Control: Key factor - Make or Buy decision – Selection of Product mix – Fixation of Selling price – Closure of a Department or Discontinuing a product - Foreign market offer – Maintaining a desired level of profit.

Unit-V

Standard Costing: Definition – Features – Advantages – Limitation – Analysis of Variances – Materials Variance – Labour Variance.

(Weightage of marks: Problems – 80% Theory - 20%)

Text Books:

1. T.S. Reddy & Hari Prasad Reddy – Management Accounting – Margham Publications, Chennai.
2. Murthy A and Gurusamy S –Management Accounting: Theory & Practice –Vijay Nicole Pvt. Ltd.
3. R.S.N. Pillai & Bhagavathi – Management Accounting – S. Chand & Co. Ltd., New Delhi.
4. S.P. Jain and Narang – Cost Accounting – kalyani Publishers, New Delhi.

PAPER – 11

BUSINESS ENVIRONMENT

Objectives:

To provide the students to have an overview of business environment.

To provide opportunities to analyze and approach the need for environment.

UNIT-I

The concept of Business Environment - Its nature and significance - Brief overview of political - Cultural - Legal - Economic and social environments and their impact on business and strategic decisions.

UNIT-II

Political Environment - Government and Business relationship in India - Provisions of Indian constitution pertaining to business

UNIT-III

Social Environment - Cultural heritage - Social attitudes - impact of foreign culture - castes and communities - Joint family systems - Linguistic and Religious groups - Types of Social Organization

UNIT-IV

Economic Environment - Economic Systems and their impact of Business - Macro Economic Parameters like GDP - Growth Rate - Population - Urbanization - Fiscal deficit - Plan investment - Per capita Income and their impact on business decisions

UNIT-V

Financial Environment - Financial System - Commercial banks - RBI - IDBI - Non-Banking Financial Companies NBFC's

Text Books:

1. Dr. S. Sankaran - Business Environment, Margham Publications
2. Namitha Gopal –Business Environment –Vijay Nicole Imprints
3. Aswathappa - Business Environment.
4. Joshi - Business Environment- Kalyani Publishers

Books for Reference:

1. Francis Cherunilam - Business Environment.
2. Dasgupta and Sengupta - Government and Business in India
3. International Business Environment - Prentice - Hall of India.
4. Suresh Bedi – Business Environment –Excel Books ,New Delhi.
5. Paul – Business Environment

PAPER 12
OPERATIONS RESEARCH

Objective:

To make students understand the various tools and techniques like Linear Programming problems, transportation problems, assignment problems, game theory used in business decision making.

UNIT - I

Operations Research – Various Models – Application and Scope – Merits and Demerits.

Linear Programming Problem (LPP) – Characteristics – Formulation – Graphical Method of solving LPP – Simple Problems.

Unit - II

Assignment Problems – Transportation Problems – Degeneracy – Methods of finding Initial Basic Feasible Solution – Simple Problems.

Unit - III

Game Theory – Value of Game – Optimum Strategy – with Saddle Point – without Saddle Point – Dominance Rule – Graphical Method of solving Game – Simple Problems.

Unit - IV

Sequencing Problem – Processing n jobs through two machines – processing n jobs through three machines – Replacement Models – Simple problems.

Unit - V

Networking – Critical Path Method (CPM) – Problem Evaluation and Review Technique (PERT) – Basic Differences between PERT and CPM – Construction of Network Diagram – Rules – Simple Problems.

Proportion of Theory and Problem: 20:80

Text Books:

1. Dr. P. R. Vittal – Operations Research – Margham Publications.
2. Gurusamy S – Elements of Operations Research – Vijay Nichole Imprints (P) Ltd.
3. J. k. Sharma – Operations Research – Laxmi Publications pvt. Ltd.

Reference Book:

1. Gurusamy S – Operations Research – Vijay Nichole Imprints (P) Ltd.

ALLIED – 2

(to choose any 1 out of 3)

PAPER – 4

A. ORGANISATIONAL BEHAVIOUR

Objectives:

To familiarize the students with behavioral pattern of human beings at individual and group level in the context of an organization, which in its turn is influenced by the environmental enveloping it.

To enhance the students well regard to knowledge, production and control of human behavior.

UNIT-I

Organizational behavior - meaning – Nature - importance – Role - historical development of organizational behavior - organization as a social system - socio-technical system - open system - factors influencing organizational behavior - environmental factors - constraints over organization and managerial performance.

UNIT-II

Meaning of group and group dynamics - reasons for the formation of groups - characteristics of groups - theories of group dynamics - types of groups in organization - group cohesiveness - factors influencing group cohesiveness - group decision making process - small group behavior.

UNIT-III

Leadership concept - characteristics - leadership theories - leadership styles - managerial grid - leadership continuum - leadership effectiveness. Motivation - concept and importance - motivators - financial and Non-financial - theories of motivation. Morale – Meaning – Characteristics – Determinants of Morale.

UNI - IV

Organizational culture –Definition – Determinants of Organisational culture – Characteristics – Types – Functions. Organisational Climate –Definition –Determinants of Organisational Climate – Distinction between Organisational Culture and Organisational Climate. Organisational Effectiveness – Definition – factors influencing Organisational Effectiveness – Approaches to Organisational Effectiveness. Organisational Conflict – Definition –Features – Sources of Conflict – Different stages of conflict –Measures to stimulate conflicts.

UNIT-V

Management of change: meaning - importance - resistance to change - causes - dealing with resistance to change - concepts of social change and organizational causes - factors contributing to organizational change - organizational development - meaning and process.

Text Books:

1. K.Sundar and J.Srinivasan – Elements of Organisational Behaviour – Vijay Nicole Imprints Private Limited
2. Dr. C.D. Balaji – Organisational Behaviour –Margham Pubications
3. J. Jayasankar - Organizational behavior, Margham Publications
4. Aswathappa. K. - Organizational behavior - HPH, Bombay.
5. S.S. Khanka - Organizational Behavior.
6. Dr.P.K.Ghosh , Partho Ghosh – Organisation Behaviour –Laxmi publications Pvt. Ltd.

Books for Reference:

1. Sekaran, Uma - Organizational Behavior-text & cases - Tata McGraw Hill Pub Ltd., New Delhi, 1989.
2. Robbins, P.Stephen - Organizational Behavior-concepts, controversies & Applications - Prentice Hall of India Ltd., New Delhi, 1988.
3. Luthans Fred - Organizational Behavior - McGraw Hill Publishers Co. Ltd., New Delhi.
4. Rao, VSP and Narayana, P.S. - Organization Theory & Behavior - Konark Publishers Pvt. Ltd., Delhi, 1987.
5. Prasad, L.M - Organizational Theory & Behavior - Sultan Chand & Sons, New Delhi.

ALLIED – 2

PAPER – 4

B.PROJECT MANAGEMENT

OBJECTIVES:

- 1. To familiarize students with the steps involved in managing a project.*
- 2. To help students to identify feasible projects, the methods of financing such projects and controlling its cost.*

UNIT-I

Project – Meaning – Definition – Project Management –Meaning – Definition –Characteristics – Process – Benefit –Project Life Cycle - Classification – Scope and Significance – System Approach – Project Manager – Sills, Role and Responsibilities.

UNIT-II

Project Analysis – Market and Demand Analysis –Feasibility Analysis –Technical Analysis – Financial Analysis – Break-Even Analysis – Profitability Analysis – Risk Analysis –Social Analysis - Benefit Analysis.

UNIT-III

Project Planning and Organisation – Development of Project Organisation –Forms of Project Organisation – Planning the project Organisation – Structure – Modular Approach to Project Management – Effective and Ineffective Project Management.

UNIT-IV

Project Finance – Sources – Institutional Finance to Entrepreneurs – Financial Institutions – working Capital Management – Incentives and Subsidies.

UNIT-V

Project Evaluation – Techniques for Project Evaluation and Review – Project Control – Performance Control – Cost Control – Control during stages of Project.

Text Books:

1. P.Saranavel – Project Mangement – Margham Publications.
2. V.C. Sontakki - Project Management –Himalaya Publishing House
3. Vasant Desai – Project Management – Himalaya Publishing House
4. Project Management - Choudhary – Tata McGraw Hill Pub.
5. Prasanna Chandra -Projects-Planning, Analysis ,selection, Implementation and review

Books for Reference:

1. Clifford F Gray - Project Management: The Managerial Process (Special Indian Edit.), Oregon State University.
2. Harvey Maylor –Project Management.

PAPER – 4

C. HOTEL MANAGEMENT

UNIT-I

Hotel industry - introduction and evolution - classification of hotels - types of accommodation - intermediary accommodation, grouping of accommodation.

Development of Hotel Industry in India - industry define - early history of hotel industry - Hotel Industry vs. Tourism Industry.

UNIT-II

Characteristics of hotels - activities of hotels - accommodation management - front office - housekeeping - bar and restaurant - supporting service - working of hotels - maintenance of equipments - maintenance of Account

UNIT-III

Room occupancy rate management - estimation of demand, seasonal pattern of guest company - factors affecting the determinations of room rate during seasonal off-season

UNIT-IV

Marketing functions at its relevance to Hotel Industry - sales - purchasing - storage system - industry levels - ordering levels - costing - recipe costing - menu pricing - hotel security.

UNIT-V

License - permission from authorities - Labor Department - City corporations - police - State Exercise - Department of Tourism - ESI - food and beverage service - problems and prospectus of Hotel Industry.

Text and Reference Books:

1. Andrews - Hotel Front Officer - Training Manual
2. Roday - Food for today
3. Megi - Hotels For Tourism Development Corporations
4. Tharakan - A Hoteliers Guide.

SKILL BASED SUBJECT

PAPER – 2

TOTAL QUALITY MANAGEMENT

Objective:

The objective of this course is to acquaint the students with the basic concept of Total Quality from design assurance to service assurance, to give emphasis on International quality certification systems – ISO 9000.

UNIT-I

Basic Concept of Total Quality – Evolution of Total Quality Management – Cost of Quality – Quality Productivity – Components of Total Quality Loop.

UNIT-II

Conceptual Approach to Statistical Quality Control – Acceptance Sampling and Inspection Plans – Statistical Process Control – Prevention through Process Improvement.

UNIT-III

Process Capability Studies – Humanistic Aspects of TQM – Management of Quality Circle and ZD Programmes.

UNIT-IV

Q-7 Tools – Taguchi Loss Function – Failure Analysis – Just in Time – JIT Pull System – JIT Purchase.

UNIT-V

Optimum Maintenance Decisions – Total Productive Maintenance – Process Design – Buyer - Seller Relations – Supply Chain Management.

Text Books:

1. Srinivasa Gupta & Valarmathi – Total Quality Management – Vijay Nicole Imprints
2. Subba Rao P – Total Quality Management , Tata Mc Graw Hil
3. Sridhara Bhat – Total Quality Management , Himalaya Publishing House
4. P. Saranaval & S. Balakumar – Total Quality Management , Margham Publications
5. Dr. S.Kumar – Total Quality Management – Laxmi Publications Pvt. Ltd.

Books for Reference:

1. Ansari.A and Modarress, JIT purchasing, Free press, Newyork.
2. Sandeepa Malhotra, Quality Management planning, Deep & Deep, 2006.

NON-MAJOR ELECTIVE

PAPER – 2

TRAINING AND DEVELOPMENT

Objective:

The purpose of this paper is to provide and in-depth understanding of the role of Training in the HRD, and to enable the course participants to manage the Training systems and processes.

UNIT- I

Concepts of Training and development – Identifying Training Needs – Structure and Functions of Training Department – Evaluation of Training Programme – Role, Responsibilities and Challenges to Training Managers.

UNIT-II

Techniques of on the job training – Coaching – Apprenticeship – Job Rotation – Job Instruction Training – Training by Supervisors – Techniques of off the job Training, Lecturers, Conferences, Group Discussion.

UNIT-III

Concept of Career – Career Stages – Career Planning – Need – Importance - Steps in Career Planning –Career Development – Characteristics – Need - Methods of Career Planning and Development.

UNIT-IV

Management Development – Meaning – Definition – Need and importance of Management Development – Characteristics - Levels – Management Development Process and Components of MD Programme.

UNIT-V

Need for Training in India – Government Policy on Training – Training Institutes in India – Management Development Institute.

Text Books:

1. Thirumaran D, V.Santhosh – Training and Development, Takur Publishers Chennai.
2. Rolf Lynton, Udai Pareek: Training for Development, New Delhi, Sage Publications India (P) Ltd., 1990
3. Raymond Andrew Noe: Employee Training & Development, New Delhi, Tata McGraw Hiss, International Ed., 1999
4. Lynton, R Pareek, U.: Training for Development, New Delhi, Vistaar, 2nd ed., 1990

Reference Books:

1. Lalitha Balakrishnan& Gowri Ramachandran – Training & Development – Vijay Nicole Imprints Pvt. Ltd.
2. Rao PL: HRD through In-House Training, New Delhi, Vikas Publishing House (P) Ltd.,
3. Reid M.A.: Training Interventions: managing Employee Development London, IPM, 3rd ed., 1992.
4. Aggarwala, D.V., Manpower Planning, Selection, Training and Development, New Delhi, Deep & Deep Publications (P) Ltd., 1999.

SEMESTER V

PAPER – 13

MARKETING MANAGEMENT

Objectives:

To enable the students to understand the elements of the complex world of Marketing.

To impart the students the need for marketing science in the modern business world.

UNIT-I

Fundamentals of Marketing - Role of Marketing - Relationships of Marketing with other functional areas - Concept of marketing mix - Marketing Management of Product or Services - Marketing approaches - Selling - Various Environmental factors affecting the marketing functions

UNIT-II

Buyer Behavior - Buying motives - Buyer Behavior Model - Factors influencing buyer behavior
Market segmentation - Need and basis of Segmentation - Marketing strategy - Targeting – Positioning.

UNIT-III

Sales Forecasting - Various methods of Sales Forecasting - The Product - Characteristics - Classifications - Consumer goods - Industrial goods - New product development - process - Product Life Cycle - - Product line and product mix decisions - Branding - Packaging.

UNIT-IV

Pricing - Factors influencing pricing decisions - Pricing objectives - Pricing policies and procedures - Pricing strategies – Channel of distribution - importance - Various kinds of marketing channels –Factors considered in Selecting Channel of Distribution.

UNIT-V

Promotion - Advertising -- Personal Selling - Sales Promotion

Text Books:

1. J.Jayasankar – Marketing – Maargham Publications
2. Essentials of Marketing – Sundar K, Vijay Nicole Imprints Pvt. Ltd.
3. Ramaswamy and Namakumari - Marketing Management , Laxmi Publications Pvt. Ltd
4. Rajan Nair – Marketing
5. C. N. Sontaki – Marketing Management

Books for Reference:

1. Varshney RL and Gupta SL - Marketing Management.
2. Dholokia - Marketing Management Cases & concepts, MacMillan I Ltd.
3. Bender - Secrets of Power Marketing.
4. Philip Kotler and Armstrong - Marketing Management
5. Saxena - Marketing Management - Tata McGraw Hill Pub

PAPER – 14
BUSINESS LAW

Objective:

To enlighten the students the elements of General Contract and Special Contract .

To expose the students to legislations relating to sales.

UNIT-I

Formation and essential elements of contract – Types of contract and agreements - rules as to offer, acceptance and consideration – capacity to contract – lawful object and free consent.

UNIT-II

Performance of contract – Discharge of contract – Breach of contract and remedies – Quasi contract.

UNIT-III

Guarantee – features and distinctions – Bailment and pledge – features difference – Rights and duties of bailor and Bailee.

UNIT-IV

Contract of agency – definition and meaning – Rights of Principal and agent – relation of Principal with third parties - personal liability of agent – termination of agency.

UNIT-V

Sale of goods Act 1930 – definition – sale vs. agreement to sell – express and implied conditions and Caveat and exceptions – Rights of an unpaid seller.

Text Book:

1. Dr. J. Jayasankar – Business Law- Margham Publications
2. N.D. Kapoor- Business law
3. Balachandran V and Thothadri S –Business Law – Vijay Nicole Imprints (P) Ltd

Books for Reference:

1. M.C. Dhandapani - Business law
2. M.C. Shukla - Business law
3. R.S.N. Pillai & Bagavathi- Business law
4. P.C. Tulsion - Business law

PAPER – 15

COST ACCOUNTING

Objectives:

To familiarize the students on the importance of cost ascertainment , reduction and control.

To develop the skills needed to apply costing techniques for each element of cost.

To help students to understand the procedures to calculate the cost of the product and service.

Unit -I

Cost accounting: Nature and Scope – Objective, Advantages and Limitations – Financial Vs Cost Accounting - Types of Costing - Cost Classification .

Unit-II

Cost Sheet – Meaning – Objectives – Specimen of Cost Sheet – Preparation of Cost Sheet, Tenders and Quotations.

Unit –III

Purchase department and its objectives – Purchase procedure – Store Records – Bin Card – Store Ledger Account - EOQ - Levels of Stock –Re-Order Level, Maximum Level, Minimum Level, Average Level - Methods of Pricing of Material Issues - FIFO, LIFO, Simple Average price and Weighted Average price methods.

Unit-IV

Labour Turnover: Causes, Methods of measurement and Reduction of Labour Turnover – Idle and over Time –Methods of Wage Payment – Piece Rate – Straight Piece Rate – Differential Piece Rate –Taylor’s Differential Piece Rate – Merrick’s Multiple Piece Rate – Time Rate – Incentive Plan :Halsey plan , Rowan Plan.

Unit-V

Overhead – Meaning - Classification of Overhead costs – Departmentalization of overheads – Allocation and Apportion of overhead costs – Primary Distribution of Overhead - Secondary distribution of overheads (Repeated Distribution Only).

Note: Weightage of Marks - Problems 80%, Theory 20%

Text Books:

1. T.S. Reddy & Hari Prasad Reddy – Cost Accounting – Margham Publications, Chennai
2. Murthy A &Gurusamy – Essentials of Cost Accounting –Vijay Nicole Imprints Pvt. Ltd
3. S.P. Jain and Narang – Cost Accounting Kalyani Publishers, New Delhi.
4. S.N. Maheswari – Principles of Cost Accounting – Sultan Chand & Sons, New Delhi.

Books for Reference:

1. Murthy A & Gurusamy S – Cost Accounting – Vijay Nicole Imprints
2. Tulsian P.C. – Cost Accounting – Tata McGrao Hills.
3. S.P. Iyengar – Cost Accounting – Sultan Chand & Sons, New Delhi.

PAPER - 16

COMPUTER APPLICATION IN BUSINESS

Objective:

The main objective of this course is to acquaint the students with special applications of IT in business. It will also familiarize students regarding IT application in documents handling and various other computer application in business.

UNIT-I

Information Technology Basics - Information definition - Prerequisites of Information - need for Information - components of information Technology - Role of Information Technology in Business.

UNIT-II

Word processing with MS Word: Starting Ms word - Ms word environment - working with word documents - working with text - working with tables - checking spelling and grammar - printing a document.

UNIT-III

Spreadsheets and Ms Excel: Starting MS Excel - Ms Excel environment - Working with Excel workbook - working with worksheet - Formulas and functions - Inserting charts - printing in Excel.

UNIT-IV

Making presentation with MS power point - starting Ms power point - Ms power point environment - working with power point - working with different views - designing presentation - printing in power point.

UNIT-V

Electronic Commerce - Types - Advantages and disadvantages - Electronic data interchange (EDI) - How EDI works - EDI benefits - EDI limitations - SMART card - SMART card applications.

Text Books:

1. Leon & Leon – Computer Application in Business – Vijay Nicole Imprints Pvt. Ltd
2. Dr.P. Rizwan Ahmed – Computer Application in Business with Tally –Margham Publications
3. Mohan Kumar – Computer Application in Business – Vijay Nicole Imprints Pvt. Ltd.
4. Ananthi Sheshasayee – Computer Application in Business – Margham Publications.

Book for Reference:

Introduction to Information Technology, ITL ESL, Pearson Education.

SEMESTER V
ELECTIVE
(to choose any 1 out of 3)
PAPER - 1

A. HUMAN RESOURCE MANAGEMENT

Objective:

The objective of the course is to familiarize students with different aspects of managing human resources in the organization through the phases of acquisition, development and retention.

UNIT-I

Nature and scope of HRM - Difference between Personnel Management and HRM Functions of HRM - Environment of HRM - Strategic HRM.

UNIT-II

Human Resource Planning - Recruitment - Selection - Methods of Selection - Use of various tests - Interview techniques in selection - Placement.

UNIT-III

Induction – Importance - Meaning of Training and Development - Training Methods - Techniques - Identification of Training needs.

UNIT-IV

Performance Appraisal –Definition – Need for Performance Appraisal – Objectives – Process - Methods – Compensation.

UNIT-V

Transfer - Promotion and termination of services - Career development - Mentoring - HRM Audit - Nature - Benefits - Scope - Approaches

Text Books:

1. Dr. J. Jayasankar - Human Resource Management –Margham Publications
2. Dr. C.D. Balaji – Human Resource Management – Margham Publications
3. Sundar & Srinivasan J –Essentials of Human Resource Management –Vijay Nicole Imrints
4. Murugesan G –Human Resource Management – Laxmi Publications Pvt. Ltd
5. Aswathappa K - Human Resource and Personnel Management
6. Guptha C B- Human Resource Management –Sulthan Chand & Sons.

Books for Reference:

1. Memoria CB - Personnel Management
2. Subba Rao P - Human Resource Management and Industrial Relations
3. Prasad - Getting the right people - MacMillan I Ltd
4. Pattanayak - Human Resources Management - Prentice - Hall of India
5. Decenzo/Robbins - Personnel/Human Resource Management - Prentice - Hall of India
6. Saiyadain Mirza - Human Resource Management –
7. Venkataratanam - Personnel Management & Human Resources –
8. Saxena - Marketing Management - Tata McGraw Hill Pub
9. A. M. Sheikh - Human Resource Development & Management.
10. Dwivedi RS - Human Relations and Organization Behavior

ELECTIVE

PAPER– 1

B. REWARD MANAGEMENT

Objective:

The course is designed to promote understanding of issues related to the reward or compensation system and practices of corporate sector.

UNIT-I

Introduction - significance - behavioral aspects of employee compensation and concepts of equity - economic theories Wages policy - meaning - types - wage structure - wage differentials - wage levels - wage policies - decisions

UNIT-II

Wage determination - factors influencing wage fixation, job evaluation - methods - job pricing - wage and salary surveys - rationalizing and developing wage structures.

UNIT-III

Components of pay - fringe benefits - house rent allowance - dearness allowance - money and real wages - consumer price index. Bonus - concept - bonus regulations - negotiations with unions.

UNIT-IV

Wage incentives - wage and motivation - linking wages with productivity - individual and group incentives - plant. Wide schemes - Scanlon Plan and other productivity gains sharing schemes - experience in India.

UNIT-V

Reward issues - statutory provision - institutions like wages boards and pay commissions - machinery for resolving disputes - compensative of managers - domestic and multinational companies - rewarding women.

Text Books:

1. Dr. J. Jayasankar - Human Resource Management –Margham Publications
2. Dr. C.D. Balaji – Human Resource Management – Margham Publications
3. Sundar & Srinivasan J –Essentials of Human Resource Management –Vijay Nicole Imrints
4. Murugesan G –Human Resource Management – Laxmi Publications Pvt. Ltd
5. Aswathappa K - Human Resource and Personnel Management
6. Guptha C B- Human Resource Management –Sulthan Chand & Sons.
7. K. Sundar –Human Resource Management – Vijay Nicole Imprints Pvt. Ltd

Books for Reference:

1. Narain, Laxmi: 'Managerial Compensation & Motivation in Public Enterprises, (Oxford Pub. House).
2. Sibson: 'Wages & Salaries', (American Management Association).

ELECTIVE

PAPER - 1

C. CHANGE MANAGEMENT

OBJECTIVES:

- 1. To introduce the students the concept of Organizational Change*
- 2. To enable the students to learn change management techniques*

Unit I: INTRODUCTION

Concept of organizational change - forces– micro and macro perspective– the process - Requisite for successful change- dimensions of planned change.

Unit II: RESISTANCE TO CHANGE

Introduction – sources of resistance – individual – organizational overcoming resistance to change – Role of HRD in managing change- change agents and their role in change management.

Unit III: MANAGING ORGANIZATIONAL CHANGE

Model of change - Lewin's three step model – kotter's eight step model – organizational development – organizational change implementation process – evaluation of organizational change program

Unit IV: ORGANIZATIONAL CULTURE AND CHANGE

Creating and sustaining culture - Creating a culture for change – stimulating a culture of innovation.

Unit V: CONTEMPORARY ISSUES IN ORGANIZATIONAL CHANGE

Technology and its impact in the work place – work stress – creating a learning organization – organizational change in Indian businesses – case studies related to organizational change.

Text Books:

- 1.K. Sundar – Essentials of Human Resource Management, Vijay Nicole Imprints
- Tripathy P.C -.Orgnisation Change - sultan chand, 2010.

Books for Reference :

1. Kavita Singh, Organisation Change and Development -Excel Books, 2010.
2. Kondalkar V. G,Organisation Effectiveness and Change Management- PHI Learning, 2009.

SKILL BASED SUBJECT

PAPER – 3

E – BUSINESS

Objective:

To learn the methodology of doing Business with Internet. Also, the course has been developed to introduce the concept of electronic market space and electronic commerce Infrastructure.

UNIT-I: Introduction

E-Commerce Framework – Traditional vs. E-Business Applications – Architectural Framework – The Internet as Network Infrastructure – Major Categories of E-Commerce – B2C, B2B, C2B and C2C Applications.

UNIT-II: Networks

Overview of Communication Network – Communication Processors – Communication Media – Communication Satellite – Types of Networks - Wireless Networks – – Wireless Internet Access ISDN – Dial-Up – Broadband – Wi-Fi.

UNIT-III: Firewalls and Securities

OSI Models – Network Security and Firewalls – Protocols – Types of Protocols – Client Server Network Security – Firewalls and Network Security – Data and Message Security – Encrypted Documents - Security Tools: Digital Signature, Digital Certificate .

UNIT-IV: EDI in Business

E-Commerce and World Wide Web – Electronic Data Interchange (EDI) – EDI Applications in Business, Intranet Application in Business.

UNIT- : E-Payment Systems

Online Payment – Payments Cards – Electronic Cash – Electronic Cheques - Electronic Wallets – Debit Cards- Credit Cards – Smart Cards – – Stored Value Cards – Banking : Net Banking, Mobile Banking - Internet Technologies .

Text Books:

1. Dr. P.RizwanAhmed , E-Business & E-Commerce, Margham Publications
2. Dr.K.Abirami Devi and Dr. M. Algammai , E-Commerce –Margham Publications
3. Srinivasa Vallabhan SV, E-Commerce ,Vijay Nicole Imprints Pvt. Ltd.
4. Mamta Bhusry , E-Commerce, Laxmi Publications Pvt. Ltd.
5. U.S.Pandey, Rahul Srivastava, Saurabh Shukla, E-Commerce and its applications, S.Chand, New Delhi.

Books for Reference:

1. Pete Loshin, John Vacca – Electronic Commerce –Laxmi Publicacations
2. R.Kolkota and A.B.Whinston: Frontiers of Electronic Commerce, New Delhi, Addision Wesley.
3. P.T.Joseph: Electronic Commerce: A Managerial Perspective, Prentice Hall of India Learning, New Delhi, 3rd Edition, 2008.
4. Efraim Turbon, Jae Lee, David King, H.Michael Chung, Electronic Commerce, A Managerial Perspective, Pearson Education Asia, 2001.

SEMESTER VI

PAPER - 17

INDUSTRIAL RELATIONS AND LABOUR LAWS

Objectives:

To introduce the basic concepts of industrial relations to the students.

To familiarize the students with the terms of collective bargaining in the light of industrial conflict.

UNIT-I

Industrial Relations - Role - Importance - Trade Unions - Industrial disputes and their Resolutions.

UNIT - II

Participative Management - Structure - Scope - Collective Bargaining - Works Committee - Joint Management Councils - Pre-Requisite for successful participation - Role of Government in Collective Bargaining.

UNIT-III

Industrial unrest - employee dissatisfaction - Grievances - Disciplinary Action - Domestic Enquiry - Strikes - lockout - Prevention of Strikes - Lockouts.

UNIT-IV

Indian Factories Act: Objectives – Provisions of the Act regarding Welfare – Health – Safety Measures of Workers.

UNIT-V

Workmen's Compensation Act and International Labor Organization - Role and Functions.

Text Books:

1. Sreenivasan M.R - Industrial Relations & Labor legislations ,Margham Publications
2. Nandhakumar B – Industrial Relations, Labor Welfare and Labor Laws, Vijay Nicole Imprints Pvt. Ltd.
3. Aswathappa K - Human Resource and Personnel Management

Reference Books:

1. Michael V Industrial Relations in India and Workers Involvement in Management
2. Cowling – Essence of Personnel Management and Industrial Relations – Prentice – Hall of India.
3. Monoppa - Industrial Relations
4. Subba Rao P - Human Resource Management and Industrial Relations

PAPER – 18

ENTREPRENEURIAL DEVELOPMENT

Objective:

The objective of the course is to make the students understand its concept of entrepreneurship and to give a comprehensive idea of opportunities for small enterprises.

UNIT-I

Introduction - Understanding the meaning of Entrepreneurialship - Characteristics of an Entrepreneur - Classification of the Entrepreneurs - Entrepreneurial Scene in India - Factors influencing Entrepreneurship – Functions of an Entrepreneur.

UNIT-II

Entrepreneurial growth - Role played by government and Non-Government agencies in promoting Entrepreneurship - Entrepreneurship Development Programmes - SISII, TIIC, SIDBI, DIC, NSIC, IDBI, IFCI

Problems of Entrepreneurs: Women entrepreneurs - Rural Entrepreneurs - Small scale entrepreneurs and Export Entrepreneurs.

UNIT-III

How to enter into Market? - Business idea generation Techniques - Identification of Business Opportunities - Marketing Feasibility - Financial Feasibility – Technical Feasibility - Legal Feasibility.

UNIT-IV

Project Appraisal - Methods - Techniques - Preparation of Business Plan - Content of a Business Plan - Project Report.

UNIT-V

Procedure for starting an enterprise – factors involved in selecting new unit - Franchising and Acquisition – Qualities of successful Entrepreneurs –Case Study

Text Books:

1. Dr. Jayshree Suresh - Entrepreneurial Development – Margham Publications
2. Raj Shankar –Essentials of Entrepreneurship – Vijay Nicole Imprints Pvt. Ltd.
3. Khanka - Entrepreneurial Development.

Books for Reference:

1. Saini - Entrepreneurship : Theory & Practice.
2. Gupta CB - Entrepreneurial Development.
3. Vasant Desai - Dynamics of Entrepreneurial Development and Management.

PAPER - 19
GROUP PROJECT

A group of not exceeding 5 students will be sent for training in business establishments for 15 days and assigned a project in the beginning of the sixth semester. The Project Report shall be submitted to the college before the end of the sixth semester.

The Project Report shall be evaluated by External Examiner. Project Report shall carry 75 Marks and Viva-Voce Examination 25 Marks. Total: 100 Marks.

If a Candidate fails to submit the project work or fails to appear for the Viva-Voce Examination then the Candidate should submit or appear only in the next Viva-Voce Examination.

**SEMESTER VI
ELECTIVE
(Choose any 1 out of 3)
PAPER -2**

A. FINANCIAL MANAGEMENT

OBJECTIVES:

1. *To expose the students to the fundamentals of finance.*
2. *To develop an understanding of tools that are used to value investment projects.*
3. *To provide knowledge using concepts, methods & procedures involved in managerial decision making.*

Unit I:

Financial Management – Definition - Importance - scope - objectives – functions - financial decisions –Types - role of the finance manager –relationship of financial management with other functional areas of management– sources of finance – time value of money .

Unit II

Financial planning – capitalization – Capital structure decision – factors determining capital structure – Indifference Point EBIT – Leverages – operating – financial – Composite leverage.

Unit III

Cost of Capital - Meaning – significance – cost of debt – cost of preference shares – cost of equity – cost of retained earnings – weighted average cost of capital.

Unit IV

Capital Budgeting -Meaning – importance – techniques of capital budgeting – Payback period – Average rate of return – Net present value – Profitability index and Internal rate of return.

Unit V

Working Capital Management – constituents of current assets and liabilities – Operating Cycle – classification of working capital – factors determining working capital – Management of working capital – estimation of working capital requirement.

Note: The proportion between Theory and Problem shall be 60:40

Text Books:

1. Dr. A. Murthy, Financial Management –Margham Publications
2. Maheshwari S.N., Financial Management, Sultan & Sons Publications
3. S.N. Maheshwari , Elements of Financial Management – Sultan Chand & Sons.
4. J. Srinivasan, Sridhar & Ramalingam – Financial Management – Vijay Nicole Imprints
5. R.K. Sharma, Shashi and K.Gupta , Financial Management –, Kalyani publication
6. Prasanna Chandra, Fundamentals of Financial Management – Tata McGraw Hills Publishing Company Limited.

Books for Reference:

1. Periasamy –Financial Management, Vijay Nicole Imprints
2. I.M. Pandey , Financial Management –, Vikash Publishing House Pvt. Ltd.
3. M.Y.Khan & P.K. Jain , Theory and Problems in Financial Management –, Tata McGraw Hills Publishing Company Limited.
4. P.V. Kulkarni Financial Management - - Himalaya Publishing House

ELECTIVE

PAPER- 2

B. FINANCIAL SERVICES

Objective:

To enable the students to gain knowledge of business financial services.

UNIT I

Meaning and importance of financial services – Types of financial services – Financial services and economic environment – Players in Financial Services Sector.

UNIT II

Merchant Banking – Functions – Issue management – managing of new issues – Underwriting – Capital market – Stock Exchange – Role of SEBI

UNIT III

Hire purchase - Rights and Duties of Hire Vendor and Hire Purchaser.

UNIT IV

Factoring – Features – Types – Advantages and Disadvantages - Functions of Factor – Factoring Vs. Bills Discounting –Forfeiting – Benefits - Consumer finance .

UNIT V

Venture Capital – Meaning –Features – Venture Capital Financing Process – Evaluation Criteria – Methods of Venture Financing – Limitations of Venture Capital.

Text Books:

1. Gurusamy, S - Financial Services – Vijay Nicole Imprints Private Ltd
2. B. Santhanam - Financial Services , Margham Publications

Books for Reference:

- 1.M.Y. Khan –Indian Financial System – Tata Mc Graw Hill
- 2.Dr. S. Gurusamy – Financial Services and System -Vijay Nicole Imprints
- 3.H. R. Machiraju – Indian Financial System –Vikas Publishing House
- 4.Dr. N. Premavathy – Financial Services and Stock Exchange –Sri Vishnu Publications
- 5.E. Gordon and E.Nataraj – Financial Markets & Services

ELECTIVE

PAPER – 2

C. INVESTMENT MANAGEMENT

Objectives:

To impart skill on the fundamentals of Investment and Security Analysis.

To identify the risk and returns involved in managing investment.

Unit I

Investment –Meaning – Objectives – Investment Vs. Speculation –Investment Process – Investment information – Management of Investment.

Unit II

Investment Alternatives – Meaning – variable Income Securities – Fixed Income Securities – Tax Sheltered Saving Schemes –Mutual Funds –Real Assets – Modern Investment –Arts and Techniques.

Unit III

Risks and Returns – Meaning – Systematic Risks – Unsystematic Risks – Risk Measurement – Capital Returns and Revenue Returns –Computation of Expected Risks and Returns.

Unit IV

Investment Valuation – Time Value for Money – Bond Valuation – Yield to Maturity – Equity Valuation – capital asset pricing model.

Unit V

Investment Analysis – Fundamental Analysis –Economic Analysis – Industry Analysis – Company Analysis – Financial Analysis.

Text Books:

1. Dr. L. Natarajan-Investment Management – Margham Publications
2. V.k.Bhalla ,Investment Management
3. Gurusamy S, Security Analysis and Portfolio Management, Vijay Nicole Imprints.
- 4.

Books for Reference:

1. Prasanna Chandra – Investment Analysis and Portfolio Management ,Tata Mc Graw Hill
2. R.P.Rustagi ,Security Analysis and Portfolio ,HPH
3. S.Kevin,Security Analysis and Portfolio Management ,Prentice Hall

**SEMESTER VI
ELECTIVE
(to choose any 1 out of 3)**

**PAPER- 3
A. MARKETING RESEARCH**

Objective:

The objective of this course is to understand the various aspects of Marketing Research, identify the various tools available to a Marketing Researcher and helps in marketing decision making.

UNIT- I

Introduction to Marketing Research – Definition – Objectives – Growing importance of Marketing Research – Main Divisions of Marketing Research – Uses of Marketing Research – Limitations and Threats to Marketing Research.

UNIT – II

Marketing Research Process – Problem Definition – Research Purpose – Research Objective – Research Design.

UNIT – III

Data Collection – Methods of Data Collection – Secondary Data – Sources of Secondary Data – Primary Data – Collection of Primary Data – Observation – Questionnaire – Designing a Questionnaire – Interviewing – Interviewing skills on the part of the investigator.

UNIT – IV

Basics of Sampling – Advantages and Limitations of Sampling – Sampling Process – Sampling Techniques – Probability and Non-Probability Sampling.

UNIT –V

Application of Marketing Research – Product Research – Advertising Research .

Text Books:

1. Dr.P. Ravilochanan –Marketing Research – Margham Publications
2. Sharma D - Marketing Research
3. S.L. Gupta - Marketing Research
4. G.C. Berry - Marketing Research
- 5 . S. Sumathi and P. Saranaval,Marketing Research and Consumer Behaviour

Reference Books:

1. Tull and Hawking - Marketing Research
2. Boyd and Westfall- Marketing Research
3. Aaker - Marketing Research

ELECTIVE

PAPER – 3

B. RURAL MARKETING MANAGEMENT

Objectives:

To enable the students to understand the elements of the unexplored rural market.

To identify the significance and strategies of rural markets.

UNIT – I

Understanding rural consumers – Defining rural India – Evolution of rural marketing – Rural Market Structure – Constitution of rural market – Size of rural market – Rural Market Environment.

UNIT – II

Product Strategy – Rural Product Categories – New Product Development – Rural Packaging – Branding in rural India.

UNIT – III

Pricing Strategy – Introduction – Objectives – Rural Pricing Strategy – Market Entry Strategy.

UNIT – IV

Channel of Distribution – Evolution of Rural Distribution System – Behaviour of Channels – Prevalent Ideal Rural Distribution Model.

UNIT – V

Promotion – Promotion Mix – Creating the Advertisement of Rural Audiences – Rural Media – Conventional and Non- Conventional Media – Innovation in Rural Markets.

Text Books:

- 1.P. Kashyap & S.Raul, The Rural Marketing
2. C.S.G.K.M.L Ramakrishnan,Rural Marketing –Text and Cases
- 3.Sukhpal Sing, Rural Marketing

Books for Reference:

- 1.M. Kamath & R. Ramakrishnamurthy – A Text Book on Rural Marketing
- 2.Shipra Chawla , A Text of Rural Marketing.

**ELECTIVE
PAPER – 3
C. EXPORT MANAGEMENT**

Objective:

The objective of the course is to convey the relevance of export, foreign exchange and to create an understanding on export procedure and policies.

UNIT – I

Export Management – Meaning & Definition - Need for Export Management – Nature of Export Management – Functions of Export Manager – Barriers to Export – Problems faced by the exporters in export.

UNIT – II

Export Incentives – Duty Entitlement Pass Book Scheme – Duty Exemption Entitlement – Export Promotion Capital Goods Scheme – Export Oriented Units – Export Houses – Trading Houses – Star Trading Houses.

UNIT – III

Export Finance – Nature of Export Finance – General Guidelines to the banks for export financing –pre-shipment Finance – Post-shipment Finance –Export Import Bank, Export Risks Identification –Credit Risks –Cargo Risks –Prevention or Reduction of Risk – Credit Risk and Export Credit and Guarantee Corporation of India (ECGC) –Cargo Insurance.

UNIT – IV

Government Institutions assisting in promoting Export –Ministry of Commerce – Directorate General of Foreign Trade (DGFT) – Export Promotion Council (EPC) – Indian Institute of Foreign Trade(IIFT) - India Trade Promotion Organisation (ITPO)– Federation of Indian Export Organisation(FIEO) – State Trading Corporation (STC).

UNIT – V

Export Procedures – Terms of Payment used in Export -Documents used in Export Trade – Proforma Invoice – Commercial Invoice – Consular Invoice – Shipping and Air Cargo Documents – Banking Documents.

Text Books:

- 1.P.K. khurana , Export Management
- 2.D.C. Kapoor, Export Management
- 3.Kumar & Mittal, Export Management
- 4.Balagopal,Export Management

Reference Book:

- 1.Francis Cheruvilam, Export Management.

SKILL BASED SUBJECT

PAPER – 4

CREATIVITY AND INNOVATION MANAGEMENT

Objective:

To enable the students to learn the various aspects of creativity and innovation.

UNIT-I

What is Creativity – Individual and Group Creativity – Convergent Thinking – Divergent Thinking and Generation of Creative Ideas?

UNIT-II

Thinking Hats Methods – Redefinition Techniques – Random Stimulus – Generation of Creative Ideas in Groups – Brainstorming – Reverse Brainstorming – Synaptic – Morphological Method.

UNIT-III

Creativity Exercises – Mental Gym – The Way the Mind Works – Difference Between Lateral and Vertical Thinking – Attitudes Towards Lateral Thinking – Basic Nature of Lateral Thinking – Techniques – The Generation of Alternatives – Challenging Assumptions.

UNIT-IV

Innovation – Suspended judgment – Analogies – Lateral Thinking – What is a Problem – Defined Problems – Creative Problem Solving – Models of Techniques of Creative Problem Solving

UNIT-V

Comparison of Creativity Techniques – Mental Gym Quiz – Blocks of Creativity – Fears and Disabilities – Energy for your Creativity – Creative – Making Your Environment More Creative – The Creative Life Quiz – Case Study

Text Books:

1. Dr. P. Rizwan Ahmed –Creativity and Innovation Management – Margham Publications
2. NCTE Rastogi - Managing Creativity for Corporate Excellence –Mc Millan
3. Pradip NCTE and Khandwalla -Lifelong Creativity –Tata Mc Graw Hill.

Reference Books:

1. Davis Gary and Scot - Training creative Thinking - New York Pub.
2. Edward de Bono - Lateral Thinking –Penguin Pub.
3. Peter F.Drucker - Innovation and Entrepreneurship

THIRUVALLUVAR UNIVERSITY

B. COM., (GENERAL)

Degree Course

CBCS Pattern

(With effect from 2017-18)

The course of study and the scheme of Examination

Semester – I

| S. No. | Part | Study Components | Ins. Hrs. / Week | Credit | Title of the paper | CIA | Uni. Exam | Total |
|----------------|------|------------------|------------------|--------|--|-----|-----------|-------|
| | | Course Title | | | | | | |
| SEMESTER – I | | | | | | | | |
| 1 | I | Language – I | 6 | 4 | Tamil – I / Other Language | 25 | 75 | 100 |
| 2 | II | English – I | 6 | 4 | English – I | 25 | 75 | 100 |
| 3 | III | Core Paper – I | 6 | 4 | Financial Accounting – I | 25 | 75 | 100 |
| 4 | III | Core Paper – II | 4 | 3 | Business Organisation | 25 | 75 | 100 |
| 5 | III | Allied – I | 6 | 4 | (To choose one out of 3) a. Indian Economy – I b. Business Mathematics c. Consumer Protection and Consumer Rights | 25 | 75 | 100 |
| 6 | IV | EVS | 2 | 2 | EVS | 25 | 75 | 100 |
| | | | 30 | 21 | | 150 | 450 | 600 |
| | | | | | | | | |
| SEMESTER – II | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language – II | 6 | 4 | Tamil – II / Other Language | 25 | 75 | 100 |
| 2 | II | English – II | 4 | 4 | English – II | 25 | 75 | 100 |
| 3 | III | Core Paper – III | 6 | 4 | Financial Accounting – II | 25 | 75 | 100 |
| 4 | III | Core Paper – IV | 4 | 3 | Elements of Insurance | 25 | 75 | 100 |
| 5 | III | Allied – II | 6 | 6 | (To choose one out of 3) a. Indian Economy – II b. Logistic Management c. Merchant Banking | 25 | 75 | 100 |
| 6 | IV | Value Education | 2 | 2 | Value Education | 25 | 75 | 100 |
| 7 | IV | Soft Skill | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | 30 | 21 | | 175 | 525 | 700 |
| | | | | | | | | |
| SEMESTER – III | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Core Paper – V | 6 | 4 | Corporate Accounting – I | 25 | 75 | 100 |
| 2 | II | Core Paper – VI | 5 | 4 | Business Law | 25 | 75 | 100 |
| 3 | III | Core Paper – VII | 4 | 3 | Banking Theory, Law & Practice | 25 | 75 | 100 |

| | | | | | | | | |
|----------------------|-----|---------------------------|-----------|-----------|--|------------|------------------|--------------|
| 4 | III | Core Paper – VIII | 4 | 3 | Business Statistics – I | 25 | 75 | 100 |
| 5 | III | Allied – III | 6 | 4 | Business Economy – I | 25 | 75 | 100 |
| 6 | IV | Skill based Subject - I | 3 | 3 | E-Commerce & Its Applications | 25 | 75 | 100 |
| 7 | IV | Non-Major - I | 2 | 2 | Elements of Accountancy | 25 | 75 | 100 |
| | | | 30 | 23 | | 175 | 525 | 700 |
| SEMESTER – IV | | | | | | CIA | Uni. Exam | Total |
| 1 | III | Core Paper – IX | 6 | 4 | Corporate Accounting – II | 25 | 75 | 100 |
| 2 | III | Core Paper – X | 5 | 4 | Company Law | 25 | 75 | 100 |
| 3 | III | Core Paper – XI | 4 | 3 | Business Communication | 25 | 75 | 100 |
| 4 | III | Core Paper – XII | 4 | 3 | Business Statistics – II | 25 | 75 | 100 |
| 5 | III | Allied – IV | 6 | 6 | Business Economy – II | 25 | 75 | 100 |
| 6 | IV | Skill based Subject - II | 3 | 3 | Industrial Organisation | 25 | 75 | 100 |
| 7 | IV | Non-Major - II | 2 | 2 | Advertising and Salesmanship | 25 | 75 | 100 |
| | | | 30 | 25 | | 175 | 525 | 700 |
| SEMESTER – V | | | | | | CIA | Uni. Exam | Total |
| 1 | III | Core Paper – XIII | 6 | 4 | Cost Accounting – I | 25 | 75 | 100 |
| 2 | III | Core Paper – XIV | 5 | 4 | Practical Auditing | 25 | 75 | 100 |
| 3 | III | Core Paper – XV | 6 | 4 | Business Management | 25 | 75 | 100 |
| 4 | III | Core Paper – XVI | 6 | 4 | Income Tax Law & Practice – I | 25 | 75 | 100 |
| 5 | III | Elective – I | 4 | 3 | (To choose one out of 3) a. Entrepreneurial Development b. Industrial Relations c. Management Information System | 25 | 75 | 100 |
| 6 | IV | Skill based Subject - III | 3 | 3 | Principles of Marketing | 25 | 75 | 100 |
| | | | 30 | 22 | | 150 | 450 | 600 |
| SEMESTER – VI | | | | | | CIA | Uni. Exam | Total |
| 1 | III | Core Paper – XVII | 6 | 5 | Cost Accounting – II | 25 | 75 | 100 |
| 2 | III | Core Paper – XVIII | 6 | 5 | Management Accounting | 25 | 75 | 100 |
| 3 | III | Core Paper – XIX | 6 | 5 | Income Tax Law & Practice – II | 25 | 75 | 100 |
| 4 | III | Elective – II | 5 | 3 | (To choose one out of 3) a. Financial Management b. Business Environment c. Office Management | 25 | 75 | 100 |
| 5 | III | Elective – III | 4 | 3 | (To choose one out of 3) | 25 | 75 | 100 |

| | | | | | | | | |
|---|----|--------------------------|-----------|-----------|--|------------|------------|------------|
| | | | | | a. Human Resource Management b. Financial Services c. Portfolio Management | | | |
| 6 | IV | Skill based Subject – IV | 3 | 3 | Computer Application in Business | 25 | 75 | 100 |
| 7 | | Extension Activities | - | 1 | | 100 | 0 | 100 |
| | | | 30 | 25 | | 250 | 450 | 700 |

Consolidated statement

| Part | subject | Papers | credit | Total credits | Marks | Total Marks |
|------------|-------------------------|-----------|--------|---------------|-------|-------------|
| Part - I | Languages | 2 | 4 | 8 | 100 | 200 |
| Part - II | English | 2 | 4 | 8 | 100 | 200 |
| Part - III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 6 | 12 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 19 | (3-7) | 73 | 100 | 1900 |
| Part - IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft Skills | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Language & Others / NME | 2 | 2 | 4 | 100 | 200 |
| | Skill based | 4 | 3 | 12 | 100 | 400 |
| Part - V | Extension Activities | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

THRUVALUVAR UNIVERSITY
B.COM (GENERAL)
SYLLABUS
UNDER CBCS
(With effect from 2017-2018)
SEMESTER – I
CORE PAPER - 1
FINANCIAL ACCOUNTING - I

Objective:

To gain knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Introduction

Meaning of accounting – objectives of accounting – advantages and limitations of accounting- Accounting concepts and conventions - Methods of accounting -Rules of debit and credit- Journal - Ledger accounts– Trial Balance - Errors and their rectification - Rectification of Errors without suspense a/c - Rectification errors with suspense a/c (effect of rectification on profit and rectification during subsequent accounting year are excluded) - Bank Reconciliation Statement.

Unit - II: Depreciation, Provisions and Reserve

Meaning of depreciation – causes for depreciation – need for charging depreciation – Methods of calculating depreciation: straight line method and written down value method (change in method of depreciation is excluded) – Methods of recording depreciation: by charging depreciation to assets account or by creating provision for depreciation account.

Unit - III: Bills of exchange

Meaning of bill of exchange - features and advantages of bill of exchange- types of bill of exchange: Trade bills and accommodation bills - Accounting treatment of trade bills (accommodation bills are excluded).

Unit - IV: Final accounts

Meaning of final accounts – adjustments in preparation of final accounts – preparation of trading, profit & loss account and balance sheet of sole proprietorship concern.

Unit V: Accounts from incomplete records

Meaning of single entry system – features and limitations of single entry system – Distinction between single entry system and double entry system - Methods of calculation of profit: Statement of affairs method and Conversion method – Distinction between statement of affairs and balance sheet.

Note: Questions in section A,B and C shall be in the proportion of 20: 80 between theory and problems

Text books

1. Jain & Narang, Financial Accounting, Kalyani Publishers, New Delhi.
2. T.S. Reddy & Dr. A. Murthy, Financial Accounting, Margham Publications, Chennai.

Reference books

1. Gupta, R.L. & Gupta, V.K., Advanced Accounting, Sulthan Chand & Sons, New Delhi.
2. Shukla & Grewal, Advanced Accounting, S. Chand & Co. New Delhi.
3. Parthasarathy, S. & Jaffarulla, A. Financial Accounting, Kalyani Publishers, New Delhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

CORE PAPER- 2
BUSINESS ORGANISATION

Objective:

To gain a knowledge of Business Organization and its importance.

UNIT - I

Business - meaning and types - Profession - meaning and importance of business Organization - Social Responsibilities of Business - Business Ethics.

UNIT - II

Forms of Business organization - sole trader - partnership - joint Hindu family - joint stock companies - co-operative societies - public utilities and public enterprises - Public Sector vs. Private Sector

UNIT - III

Location of industry - factors influencing location - size of industry - optimum firm - advantages of large - scale operation - limitation of small scale operation - industrial estates - district industries centres.

UNIT - IV

Stock Exchange - Function - Types - Working - Regulation of Stock Exchanges in India - Business Combination - Causes - Types - Effects of Combination in India.

UNIT-V

Trade association - Chamber of commerce - Functions - Objectives - Working in India.

Text Books:

1. Y.K.Bhushan, Business organization, Sultan Chand, New Delhi.
2. Business organization & Management, R.N. Gupta, S. Chand & Co. New Delhi.
3. Dr. K. Sundar, Business Organisaion, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

Reference Books:

1. Prakash&Jagedesh, Business organization & Management.
2. Reddy &Gulshar, Principles of Business Organization & Management
3. Vasudevan&Radhasivam, Business Organization.

ALLIED - 1

(to choose any 1 out of 3)

PAPER - 1

A. INDIAN ECONOMY - I

Objective

To acquire sufficient knowledge about India's Economic features; occupational structure and the relative shares of the different Sectors. Students should know that India is an emerging economic power in the World market.

UNIT-I

Features of less developed and developing Economies. - Economic and Non-Economic factors impeding Economic development - Concept of growth and development - Indicators - Factors in Economic Development.

UNIT-II

Capital Formation - Human and Physical, Savings and Investment pattern since 1991 - National Income - Methods, trends, limitation - Distribution - Recent trends in National Income - Black Money - Corruption.

UNIT-III

Human Resources - Human Resource Development Size and growth of population- Causes, impact- measures to control population- Recent Population Policy.

UNIT-IV

Agriculture - Its Contribution to Economic Development - Food Problems - Methods of solving it - Agricultural productivity - Land Reforms - Green Revolution

UNIT-V

Agricultural labour – Definition – Features- Problems – Remedies Agricultural Credit - Grameen Bank.

BOOKS FOR REFERENCE:

1. Agrawal, A.N. : Indian Economy, Vikas Publishing House, New Delhi.
2. Alak Ghosh : Indian Economy, The World Press, Kolkatta.
3. Arora, R.C. : Integrated Rural Development, S.Chand & Co.,
4. Arthur Lewis : The Theory of Economic Growth.
5. Arun Ghosh : India in Transition, Economic Policy Options, S.Chand & co.,
6. Bimal Jalan : Indian Economic Crisis, Oxford University Press, Chennai.
7. Bright Singh : Economics of Development.
8. Dewett, Verma : Indian Economics, S.Chand & Co.,
& sharma
9. Dhingra, I.C. : Indian Economy, Sultan Chand & Co.,
Economic Reforms and Employment, Indian Economic
10. Hajela & : Association,
Goswami (E.D.) New Delhi.
11. Jhingan, M.L. : Economics of Development & Planning, Konark Publishers , New
Delhi.
12. Kanka, S.S. : Human Resource Management, S.Chand & Co.,
13. Kindle berger : Economic Development.
14. Minhas : Planning for the Poor.
15. Mongia, J.N. : India's Economic Policies, Allied Publishers
(Editor)
16. Pndey, B.N. : Role of Science & Technology in Rural and Economic
Development
of India, S.Chand & Co.,
17. Pramit : The Indian Economy, Poverty and Development, Vikas Publishing
Chaudhury House, New Delhi.
18. Pramod Verma : Labour Economics and Industrial Relations, Tata McGraw Hill
Ray,
19. S.K. : Economics of Development - Prentice Hall of India.

ALLIED - 1

PAPER - 1

B. BUSINESS MATHEMATICS

Objective:

To understand the fundamentals of Business Mathematics.

UNIT-I

Sets: Finite and infinite sets - equality of sets - Disjoint sets - universal set - set operation Union of sets, intersection of sets - difference of sets - complement of sets - venn diagram - De-Morgan's law - Cartesian product.

UNIT-II

Matrices - type of matrices - matrix operation - Determinant of matrix - Singular and Non Singular matrices - adjoint, inverse of matrix - solving simultaneous linear equations - matrix inversion method and method of reduction.

UNIT-III

Co-ordinate geometry - Co-ordinates - distance between two points - straight line - Concurrent lines - slope - intercept from, slope - point from, two points form - angle between straight lines, parallel and perpendicular conditions - simple problems.

UNIT-IV

Simple interest - compound interest - annuities - discount on bills.

UNIT-V

Differentiations - limits - derivatives of standard function x^n , e^x , $\log_x e$, trigonometric functions - rules of Differentiation - Differentiation on different types of functions - successive Differentiation - maxima and minima - applications in business problems.

Reference Books:

1. S.P.Gupta, Statistical Methods, S.Chand & Co.,
2. P.R. Vittal, Business Mathematics & Statistics, Margham Publishers, Chennai.
3. Chandran & Agarwal, Business Mathematics.
4. Raghavachari, Mathematics for Management,
5. Raja Gopalan and Sattinathan, Business Mathematics, Vijay Nicole Publications, Chennai.

ALLIED - 1

PAPER - 1

C. CONSUMER PROTECTION AND CONSUMER RIGHTS

Objective:

To make students to acquire basic knowledge of consumer laws, consumer rights and consumer welfare and protection.

Unit - I

Introduction of Consumer Protection Act 1986 – Objectives - Consumer Protection Act 2006 (Amendments) – Salient features.

Unit - II

Definitions of the term: - Consumer – Types of Consumer Appropriate authority – Complainant – Consumer dispute – Restrictive Trade Practice.

Unit - III

The various Consumer Rights: - Right to Safety, Right to Information, Right to Choose, Right to be heard – Right against exploitation – Right to Consumer Education.

Unit - IV

Consumer Production Council: - Composition and Powers of National Commission, State Commission and District Consumer Forum.

Unit - V

Redressal of consumer grievances-Goods & Services covered under Consumer Protection Act-Procedure for filing of complaints with District Forum, State Commission , National Commission.

Books for reference

1. Lecture on Torts and Consumer Protection Laws by Dr. Rega Surya Rao – Asia Law House, Hyderabad.
2. Consumer Protection Laws – By Prof. RakeshKhanna – Central – Law Agency.
3. Consumer Protection (Amendment) Act, 2002. S. Chand & Sons.2012.

SEMESTER – II
CORE PAPER- 3
FINANCIAL ACCOUNTING - II

Objective:

To gain a knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Branch accounts

Meaning – objects of branch accounts – accounting in respect of dependent branches: debtors system; stock and debtors system; wholesale branch system and final accounts system - Independent branches – incorporation of branch trial balance in head office books.

Unit - II: Departmental Accounting

Meaning of departments and departmental accounting – Distinction between departments and branches- need for departmental accounting – advantages of departmental accounting - Apportionment of indirect expenses – Inter departmental transfers at cost and selling price - preparation of departmental trading, profit & loss account and balance sheet.

Unit - III: Hire purchase and Instalment purchase systems

Meaning and features of hire purchase system - calculation of interest – books of hire purchaser and books of hire vendor - default and repossession (Hire purchase trading account excluded)

Meaning of instalment system -distinction between hire purchase system and instalment system - calculation of interest – books of buyer and books of seller.

Unit - IV: Partnership accounts (fundamentals and reconstitution of partnership)

Meaning and features of partnership – Partnership deed - calculation of Interest on capital and interest on drawings – preparation of profit & loss appropriation account – preparation of capital accounts (fixed and fluctuating) – admission of a partner – retirement of a partner – death of a partner – treatment of goodwill as per AS 10.

Unit - V: Partnership Accounts (Dissolution of partnership firms)

Dissolution of a firm – insolvency of a partner (Garner Vs Murray rule) – Insolvency of all the partners – Piecemeal distribution: proportionate capital method and maximum loss method.

Note: Questions in section A, B and C shall be in the proportion of 20: 80 between theory and problems.

Text books

1. Jain & Narang, Financial accounting, Kalyani publishers, New Delhi
2. T.S. Reddy & Dr. A. Murthy, Financial accounting, Margham publications, Chennai

Reference books

1. Gupta, R.L. & Gupta, V.K., Advanced Accounting, Sultan Chand & Sons, New Delhi.
2. Shukla & Grewal, Advanced Accounting, S. Chand & Co. New Delhi.
3. Parthasarathy, S. & Jaffarulla, A. Financial Accounting, Kalyani Publishers, New Delhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

CORE PAPER- 4
ELEMENTS OF INSURANCE

Objective:

To gain a knowledge of insurance and its importance.

UNIT-I

Definition of insurance - classification of Contracts of insurance - marine and non-marine - general principles of law as applied to non-marine insurance.

UNIT-II

Life Assurance - objects of life Assurance - principles of life Assurance - different plans of life Assurance and annuities - policy condition and privilege - assignment and nomination - lapses and revivals - surrender values and loans - claims - double insurance.

UNIT-III

Marine insurance - principles of marine insurance - functions of marine insurance - proximate cause - subrogation and contribution

UNIT-IV

Types of marine policy - clauses in general use - warranties - kinds of marine losses - reinsurance and double insurance.

UNIT-V

Fire insurance - principles of law as applied to fire insurance - the subject matter of fire insurance - fire waste - hazard types of fire policy - cover notes - surveys and inspection average - re-insurance - renewals.

Text and Reference Books:

1. Dr. B. Vardharajan - Insurance Vol 1 and 2. - Tamil Text Book.
2. R.S. Sharma - Insurance Principle & Practice - Vara Bombay, 2006.
3. A. Murthy - Elements of Insurance Risk management & Insurance - Harrington, 2006 - Tata McGraw Hill pub.

ALLIED - 1

(To choose any 1 out of 3)

PAPER – 2

A. INDIAN ECONOMY - II

UNIT-I

Role of Technology - Information Technology BPO in India - their impact on Economic Development – Cyber Crime.

UNIT-II

Role of industries - Cottage & Small Scale industries - Some Large Scale industries (Cotton, Sugar, Iron & Steel, Tea & Petro Chemical) Industrial Policy - 1991 and after - Public sector Enterprises - Dis-investment and Privatisation.

UNIT-III

Transport - Importance of Transport (Roadways, Railways, Shipping and Civil Aviations) to Economic growth - Evaluation of Government in Policy in relation to privatisation policy - Transport Coordination.

UNIT-IV

Planning in India - Strategy of Indian Planning - Resources for Financing Plan - Agriculture and Industrial Development - Planning techniques - Investment Priorities – General Objectives – Targets, Achievements and Failures – 11th and 12th five year plans- NITIAYOG

UNIT-V

Poverty in India - Poverty Eradication Programmes - Recent Employment scheme- Swaraj Bharat Mission - Role of Micro finance - (SHG, Cottage and Household Sector etc.,) - Regional Development Disparities -India's Foreign Trade and Balance of Payments.

ALLIED - 1

PAPER - 2

B. LOGISTIC MANAGEMENT

Objective:

To understand the comprehensive nature of Logistics Management.

UNIT-I

Logistics - definition - scope - functions - objectives of Logistics Management - customer service and logistics.

UNIT-II

Supply Chain - components - role of logistics in supply chain - Warehousing - functions - types - warehouse layout - material handling and logistics - Inventory Management.

UNIT-III

Transportation - infrastructure - freight management - transportation network - route planning - containerization.

UNIT-IV

Logistical packaging - logistics information needs - logistics design for distribution channels - logistics outsourcing.

UNIT-V

Government policies and regulations - Motor Vehicles Act, carriage by air, sea, multi-modal transportation etc., Documentation - Airway Bill, Railway Receipt, Lorry Receipt, Bill of Lading etc.

Reference Books:

1. Vinod V. Sople, Logistics Management, Pearson Education (Singapore) P. Ltd.,
2. Satis C. Ailawadi, Rakesh Singh, Logistics Management, Prentice Hall of India, New Delhi - 110 001.
3. Ronal H. Ballou, Business Logistics / Supply Chain Management, Pearson Education, Prentice Hall, New Delhi - 2001.

Text Books:

1. Sunil Chopra & Peter Meindi, Supply Chain Management / Strategy, Planning and Operation - Pearson Education Asia, New Delhi.
2. B. S. Sahay, Supply Chain Management for Global Competitiveness, Macmillan India Ltd., Delhi.
3. B. Nanthakumar, Logistic and Supply Chain Management, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

ALLIED - 1

PAPER - 3

C. MERCHANT BANKING

Objective:

To enable the students to understand Merchant banking and its services to corporate sector.

UNIT-I

Merchant Banking – Definitions and Functions – Regulatory Framework – Registration of Merchant Bankers – Procedure Capital Adequacy Requirement – Lead Merchant Banker Appointment, Restrictions and Responsibilities

UNIT-II

Public Issue Management – Functions and Mechanism – Categories of Issue – Issue Manager – Category and Restrictions Activities Involved in Public issue Management – Marketing of New Issues – Methods – Pricing of Rights and Other Public Issues

UNIT-III

Post Issue Management – Allotment / Dispatch of Shares / Refunds – Basis of Allotment – Procedure – Listing Requirements of Stock Exchanges – Advantages – Listing Requirements of OTCEI

UNIT-IV

Capital Market Instruments – Meaning and Types – Commercial Paper – Issue of Commercial Paper – Usance – E-nomination – Ceiling – Mode of Issue – Credit Syndication – For Long Term and Working Capital

UNIT-V

Port Folio Management – Functions – Registration of Port-folio Managers – Obligation – Investment of Client Funds – Maintenance of Book and Accounts – Reports to be Furnished – Code of Conduct

Text Books:

1. Dr.S.Guruswamy, Merchant Banking and Financial Services, Vijay Nicholes Imprint Pvt. Ltd., Chennai.
2. Dr.V.Balu, Merchant Banking and Financial Services, Sri Venkateswara Publications, Chennai

Reference Books:

1. H.R. Machiraju, Merchant Banking, New Age International, New Delhi.
2. A Treatise on Merchant Banking, Skylark Publications, New Delhi
3. Dr. J.C.Verma, A Manual of Merchant Banking, Bharath Law House, New Delhi.

SEMESTER - III
CORE PAPER- 5
CORPORATE ACCOUNTING – I

Objective:

To gain comprehensive understanding of all aspects relating to corporate accounting.

Unit - I: Share capital

Meaning and types of shares - Issue and allotment of equity and preference shares- issue at par, premium and at discount – calls in advance – calls in arrears – forfeiture of shares – reissue of forfeited shares – redemption of preference shares – underwriting of shares (Determining the liability of underwriters – firm underwriting)

Unit - II: Debentures

Meaning and types of debentures - Issue of debentures at par, premium and at discount – writing off discount on issue of debentures – issue of debentures as collateral security – issue of debentures for consideration other than cash - redemption of debentures – methods – open market buying – conversion of debentures into shares – sinking fund method – insurance policy method.

Unit - III: Acquisition of Business

Meaning of Acquisition of business – accounting treatment – new set of books to be opened - same set of books to be continued – profit prior to incorporation

Unit - IV: Final accounts

Preparation of Statement of profit & loss and Balance sheet (as per revised schedule VI)

Unit - V: Amalgamation, Absorption, External and Internal reconstruction

Purchase consideration – methods - Amalgamation in the nature of merger or purchase – absorption (AS 14). Alteration of share capital – reduction of share capital (scheme of capital reduction is excluded).

Note: Questions in Sec. A, B & C shall be in the proportion of 20:80 between Theory and Problems.

Text Books

1. Jain,S.P & Narang,N.L., Advanced Accounting, Kalyani Publications.
2. Reddy T.S.& Murthy,A,Corporate Accounting, Margham Publications, Chennai.

Reference Books

1. Gupta,R.L & Radhaswamy, M, Advanced Accounts, Sulthan Chand, New Delhi.
2. Shukla & Grewal & Gupta, Advanced Accounting, S. Chand & Co., New Delhi.
3. Palaniyappan, Corporate Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

CORE PAPER - 6

BUSINESS LAW

Objective:

To gain a comprehensive knowledge on all aspects of law as applied to business.

UNIT-I

Contract - Formation and Essential Elements of Contract – Types of Contract and Agreements – Rules as to offer, Acceptance and Consideration – Capacity to Contract – Lawful Object and Free Consent – Quasi Contract.

UNIT-II

Performance of Contract – Devolution of Joint Rights and Liabilities – Discharge of Contract – Breach of Contract and Remedies.

UNIT-III

Indemnity and Guarantee – Features and Distinctions – Extent of Surety's Liability – Rights and Discharge of Surety – Bailment and Pledge – Features – Difference – Rights and Duties of Bailor and Bailee – Law Relating to Lien and Finder of Lost Goods – Rights and Duties of Pawnor and Pawnee – Pledge by Non-Owner.

UNIT-IV

Contract of Agency – Definition and Meaning – Creation – Ratification and Requisites – Rights of Principal and Agent – Relation of Principal with Third Parties – Personal Liability of Agent – Termination of Agency – Irrevocable Agency.

UNIT-V

Sale of Goods Act 1930 – Definition of Sale – Sale Vs Agreement to Sell – Subject Matter – Express and Implied Conditions and Warranties – Caveat Emptor and Exceptions – Performance of Contract – Transfer of Property – Rights of an Unpaid Seller – Sale by Non-owner – Auction Sale.

Text Books:

1. N.D.Kapoor, Business Laws, Sultan Chand & Sons, New Delhi.
2. R.S.N.Pillai&Bagavathi, Business Laws, S.Chand& Co., New Delhi.

Reference Books:

1. M.C.Dhandapani, Business Laws, Sultan Chand & Sons, New Delhi.
2. M.C.Shukla, Mercantile Law, S.Chand& Co., New Delhi.
3. P.C. Tulsian, Business Laws, Tata McGraw Hill, New Delhi.
4. Dr.N.Premavathy, Business Law, Sri Vishnu Publications, Chennai.
5. Dr.N.Premavathy, Business Law (in Tamil), Sri Vishnu Publications, Chennai.
6. Balachandran. V and Thothadri. R, Business Law, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

CORE PAPER - 7
BANKING THEORY, LAW AND PRACTICE

Objective:

To study in detail about the Central Bank and Commercial Banking System including the latest directives and decisions of Reserve Bank of India. To study the recent developments in Indian banking system. To acquire the basic knowledge about the banking transactions.

Unit - I

Origin of banks – Banking Regulation Act, 1949 – Roll of Banks and Economic Development – Central Banking and Role of RBI and their functions - Credit Control Measures of Central Bank.

Unit - II

Commercial Banks – Functions – E-Banking – ATM Cards, Debit cards, Personal Identification Number – Online enquiry and update facility – Electronic Fund Transfer – Electronic Clearing System – Credit Creation and Credit Control – Role of SBI in the Economic Development of India.

Unit - III

Types of Bank Accounts - Savings Account, Current Account - Types of Deposit Account – Fixed and Recurring Deposits Account – Procedure for opening of an Account – Types of customers (Individuals, firms and Companies) – Importance of CRM – Customer grievances and redressal – Ombudsman.

Unit - IV

Negotiable instruments – Promissory Note – Bills of Exchange, Cheque, Draft – Definitions, Features – Crossing – Endorsement – Material Alteration – Dishonour of Cheques – Paying Banker – Rights, Duties and Statutory Protection to Paying Banker – Collecting banker – Rights and Duties.

Unit - V

Principles of lending – Types of Loans – Precautions to be taken by a banker while lending against LIC Policies, Shares, Gold, Silver Ornament and Jewellery.

Text Books:

1. Banking Law Theory and Practice – Sundaram and Varshney – Sultan Chand Co.
2. Banking and Financial Systems – B. Santhanam, Margham Publishers.
3. Banking Law Theory and Practice – S.N. Maheswari – Kalyani Publications.
4. Banking Theory Law and Practice, Dr. S. Guruswamy, 3rd Edition, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

Reference Books:

1. Indian Banking – Parameswaran – S. Chand and Co.
2. Financial Services – Dr. S. Gurusamy, Tata McGraw-Hill Education India.
3. Banking Theory Law Theory and Practice – Dr. S. Gurusamy, Tata McGraw-Hill Education India.

CORE PAPER - 8
BUSINESS STATISTICS – I

Objective

To understand and apply statistical tools in business.

UNIT-I

Statistics - Definitions - Scope and Limitations - Collection of Data - Primary and Secondary Data - Questionnaire - Classification and Tabulation - Diagrammatic and graphical representation of data.

UNIT-II

Measures of Central tendency - Mean - Median - Mode - Harmonic Mean and Geometric Mean,

UNIT-III

Measures of Dispersion - Range - Quartile deviation - Mean Deviation - Standard Deviation - Coefficient of Variation - Lorenz Curve.

UNIT-IV

Measures of Skewness - Karl Pearson's and Bowley's Coefficient of Skewness - Kurtosis - Characteristics of Kurtosis - Measures - Calculation.

UNIT-V

Statistical Quality Control - Control Charts - X, P, C, R - Charts - Acceptance sampling only.

(Weightage of Marks = Problems - 80%, Theory - 20%)

Text Books:

1. Dr. S.P. Gupta, Business Statistics & Operation Research - Sultan Chand.
2. PA. Navanitham, Business Statistics & Operation Research, Jai Publications, Trichy.
3. S.P. Rajagopalan & R. Sattanathan, Business Statistics & Operation Research 3rd Edition, Vijay Nicole Publications, Chennai.

Reference Books:

1. Dr. S.P. Gupta, Statistical Methods - Sultan Chand.
2. R.S.N. Pillai & Bhagavathi, Statistics.
3. J.K. Sharma, Business Statistics - Pearson Education.
4. B. Agarwal, Basic Statistics - Wiley Eastern.

ALLIED - 2

PAPER - 3

BUSINESS ECONOMICS – I

UNIT-I

Introduction to Business Economics - Objectives of Business Profit maximization - Social responsibility of Business.

UNIT-II

Demand analysis - Demand schedule - Demand curve - Different types of Elasticity of demand - Measurement - Importance of elasticity of demand.

UNIT-III

Utility analysis - Cardinal - Ordinal - The law of diminishing marginal utility - Equi-Marginal utility - Indifference curve - Break-even analysis - Profit theories and concepts.

UNIT-IV

Demand Forecasting - Different types of Demand Forecasting.

UNIT-V

Production - Production function - The law of variable proportions - Economies of scale, Law of returns to scale.

Reference Books:

Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.

Business Economics, S. Sankaran, Margham Publications, Chennai

Managerial Economics, R.L. Varsheny and K.L. Maheshwari, Sultan & Chand. New Delhi.

Business Economics, H.L. Ahuja, S.Chan

SKILL BASED SUBJECT

PAPER – 1

E-COMMERCE AND ITS APPLICATIONS

Unit - I:

Introduction to E-Commerce – Meaning – Working of E-Commerce – Electronic Business – Categories of E-Commerce Application – Global Trading Environment and Adoption of E-Commerce – Product suitability – Comparison between Traditional and Electronic Commerce – Advantages and Disadvantages of E-Commerce.

Unit - II:

Business Models of E-Commerce – Introduction – Major challenges of B2C E-Commerce – Meaning of B2B Exchange – Development of B2B E-Commerce – Types of B2B Markets – Difference between B2C and B2B Commerce.

Unit - III:

Introduction to E-Hub Concept – Introduction to B2G Concept – E-filing.

Unit - IV:

Internet – Internet Operation – Internet Explorer – Creation of E-mail ID, E-mail etiquettes.

Unit - V:

Web Browsing – Role of Website in B2C E-Commerce, Website strategies and goals. Websites Design Principles for E-Commerce websites.

Text Books:

1. E-Commerce – SrinivasaVallabhan. S.V – Vijay Nicole Imprints Private Ltd., Chennai.

**NON-MAJOR ELECTIVE
PAPER – 1
ELEMENTS OF ACCOUNTANCY**

Objectives:

To facilitate the non- commerce students to have a basic knowledge in Book-Keeping and Accounting.

Unit - I:

Need for Accounting – Definition (AICPA) – Steps – Objectives — Double Entry System - Meaning of Debit and Credit - Advantages – Limitations – Types of Accounts – Accounting Rules – Accounting Terminology – Accounting Concepts and Conventions – Meaning and Types – Accounting Equation.

Unit - II:

Journal – Ledger Accounts – Trial Balance.

Unit - III:

Subsidiary Books – Meaning – Types (no problems from Bills Receivable Book and Bills Payable Book but only theory) – Advantages over Journal – Ledger Accounts – Trial Balance.

Unit - IV:

Errors – Classification – Rectification (Rectification after the preparation of final account is excluded) – Suspense Account – Meaning and Need.

Unit - V:

Closing and Adjustment Entries – Final Accounts with simple Adjustments.

(Weightage: Theory: 25%, Problems: 75%)

Text Books

1. Jain,S.P & Narang,N.L., Advanced Accounting, Kalyani Publications.
2. Jaya Charulatha and Baskar, Introduction to Accountancy, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

Reference Books

1. Gupta,R.L&Radhaswamy,M,AdvancedAccounts,SulthanChand,NewDelhi.
2. Shukla&Grewal&Gupta,AdvancedAccounting,S.Chand&Co.,NewDelhi.

SEMESTER – IV
CORE PAPER – 9
CORPORATE ACCOUNTING – II

Objective:

To gain accounting knowledge in advanced corporate accounting.

Unit - I: Valuation of goodwill and shares

Methods of Valuation of Goodwill – Average Profit Method – Super Profit Method – Capitalisation Method.

Methods of Valuation of Shares- Net Assets Method – Yield Method – Fair Value Method.

Unit - II: Liquidation of companies

Order of Payments – Preferential Creditors – Liquidator's Remuneration - Liquidator's Final Statement of Account - Statement of Affairs and Deficiency Account.

Unit - III: Bank and Insurance Company accounts

NPA – Interest on Doubtful Debts – Rebate on Bills Discounted – Preparation of Bank Profit & Loss Account and Balance Sheet.

Life insurance – Ascertaining Correct Assurance Fund – Revenue Account – Valuation Balance Sheet - Profit & Loss account – Balance Sheet (new format).

General Insurance – Revenue Account – Profit & Loss Account – Balance Sheet (new format).

Unit - IV: Holding company accounts

Capital Profit - Revenue Profit - Cost Of Control - Minority Interest– Elimination Of Common Transactions – Unrealised Profit – Revaluation of Assets and Liabilities – Bonus Shares - Consolidated Balance Sheet (Intercompany Investment is Excluded).

Unit - V: Inflation accounting (Accounting for price level changes)

Limitations of Historical Accounting – Meaning of Inflation Accounting – Methods of Inflation Accounting – CPP Method; Gain or Loss on Monetary Items; Valuation of Cost of Sales and Closing Inventory – CCA Method: COSA; MWCA; Depreciation Adjustment; Gearing Adjustment.

Note: Questions in Sec. A, B & C shall be in the proportion of 20:80 between Theory and Problems.

Text Books

1. Jain, S.P & Narang, N.L., Advanced Accounting, Kalyani Publications.
2. Reddy T.S. & Murthy, A, Corporate Accounting, Margham Publications, Chennai.

Reference Books

1. Gupta, R.L & Radhaswamy, M, Advanced Accounts, Sulthan Chand, New Delhi.
2. Shukla & Grewal & Gupta, Advanced Accounting, S.Chand & Co., New Delhi.

CORE PAPER - 10

COMPANY LAW

Objective:

To gain knowledge about the company law.

UNIT-I

Introduction – Meaning and Definition of a Company – Characteristics of a Company – Advantages – Limitations – Types of Companies – Distinction between a Private Ltd. Company and a Public Ltd. Company.

UNIT-II

Formation of a Company – Promotion – Functions of a Promoter – Memorandum of Association – Meaning – Contents – Purpose – Articles of Association – Meaning – Contents – Distinction between Memorandum and Articles.

UNIT-III

Prospectus – Meaning – Requirements of a Prospectus – Conditions for a Prospectus – Objects of Issuing a Prospectus – Contents – Statement in Lieu of Prospectus.

UNIT-IV

Members of a Company – Meaning and Definition – Who can become a Member? – Rights of the Members – Liabilities of the Members – Termination of Membership.

UNIT-V

Directors of a Company – Definition – Eligibility to become a Director – Number of Directorships – Appointment of Directors – First Directors – Subsequent Directors – Removal of Directors – Powers, Duties and Liabilities of Directors – Winding up of a Company – Meaning – Methods of Winding up.

Text Book:

1. N.D.Kapoor, Company Law – Sultan & Chand.

Reference Books:

1. Dr.N.Premavathy, Company Law, Sri Vishnu Publications, Chennai.
2. Gaffoor and Thothadri, Company Law, 2nd Edition, Vijay Nicholes Imprint Pvt. Ltd., Chennai.
3. Kathiresan and Radha, Company law – Prasanna Publishers, Chennai.

CORE PAPER - 11
BUSINESS COMMUNICATION

Objective:

To enable the students to know importance of communication in commerce and trade and to draft business letters.

UNIT-I

Business Communication – Meaning – Definition - Features of Business Communication – Importance of effective Communication in Business – Classification of Communication – Characteristics (7cs) and Guidelines of Effective Business Communication.

UNIT-II

Analysis of Business Letters – Basic Principles in Drafting – Appearance, Structure and Layout – Letter Styles.

UNIT-III

Various types of Business Letters – Letters of Enquiry – Offers, Quotations, Orders, Complaints and Settlement, Circular Letters, Status Enquiry – Collection Letters.

UNIT-IV

Letters of Application – Essential Qualities – Letters of Application with CV, Resumes – Application with reference to an Advertisement – Solicited and Unsolicited Letters – Reference Letters.

UNIT-V

Business Report – Importance – Characteristics – Types – Reports by Individuals and Committees.

Text Books:

1. Dr.K.Sundar, Business Communication, Vijay Nicole Publications, Chennai.
2. Rajendra Pal & J S Korlahali, Essentials of Business Communication.

Reference Books:

1. Ramesh and Pattanchetti, Business Communication, R Chand & Co.
2. Dr.N.Premavathy, Business Communication, Sri Vishnu Publications, Chennai.
3. Dr.N.Premavathy, Business Communication (in Tamil), Sri Vishnu Publications, Chennai.

CORE PAPER - 12
BUSINESS STATISTICS – II

Objective

To understand and apply statistical tools in Business.

UNIT-I

Correlation - Definition - Karl Pearson's Coefficient of Correlation - Rank Correlation.

UNIT-II

Regression Equations – Properties of Regression Lines and Coefficients – Standard Error of Estimate.

UNIT-III

Index Number - Definition - Uses - Unweighted Index Number - Simple Aggregate Price Index, Simple Average of Price Relatives Index - Weighted Index - Laspeyre's Paasche, Dorbish Bowley's - Marshall Edge worth, Fisher Ideal Index - Time and Factor Reversal Test - Cost of Living Index.

UNIT-IV

Time Series - Definition and Uses - Components - Semi Average, Moving Average - Method of Least Square - Seasonal Variation - Simple Average Method.

UNIT-V

Probability - Addition and Multiplication Theorem - Permutation and Combination - Baye's Theorem.

(Weightage of Marks = Problems - 80%, Theory - 20%)

Text Books:

1. Dr. S.P. Gupta, Business Statistics & Operation Research - Sultan Chand.
2. PA. Navanitham, Business Statistics & Operation Research, Jai Publications, Trichy.
3. S.P. Rajagopalan & R. Sattanathan, Business Statistics & Operation Research 3rd Edition, Vijay Nicole Publications, Chennai.

Reference Books:

1. Dr. S.P. Gupta, Statistical Methods - Sultan Chand.
2. R.S.N. Pillai & Bhagavathi, Statistics.
3. J.K. Sharma, Business Statistics - Pearson Education.
4. B. Agarwal, Basic Statistics - Wiley Eastern.

ALLIED - 2

PAPER - 4

BUSINESS ECONOMICS - II

UNIT-I

Cost and Revenue analysis - Different types of cost and their relations to each other - Average cost - Marginal cost - Various types of revenue curves short term and long term - Diagrammatic representation.

UNIT-II

Market structure and pricing - Pricing under perfect competition - Pricing under monopoly - Pricing under monopolistic competition.

UNIT-III

Distribution theories - Theories of profits.

UNIT-IV

Government and Business - Industrial Policy - National Income Computation – Concepts of National Income – Methods of Measuring National Income - National Income in India - Contribution.

UNIT-V

Fiscal Economics - Revenues and Public expenditure - Canons of Taxation - Fiscal policy of India.

Reference Books:

Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.

Business Economics, S. Sankaran, Margham Publications, Chennai

Managerial Economics, R.L. Varsheny and K.L. Maheshwari, Sultan & Chand. New Delhi.

Business Economics, H.L. Ahuja, S.Chand.

SKILL BASED SUBJECT - II

PAPER - 2

INDUSTRIAL ORGANIZATION

Objective:

To gain knowledge of the basic industrial structure and its working.

UNIT-I

Meaning of Industrial Organisation – Industrial Revolution – Industrial Growth – Aggregation, Consolidation, Integration - Mass Production – Importance, Advantages, Limitations – Specialisation – division of labour – its advantages and disadvantages – Industrial growth in India – major industries in India – current scenario.

UNIT-II

Industrial ownership – Sole Proprietorship - Features, merits and demerits – partnership - Features, merits and demerits - Joint Stock Company - Features, merits and demerits - Types – Public Ltd and Private Ltd companies.

UNIT-III

Physical facilities – plant location – need for selection of location – stages in selection of location – plant layout – definition, objectives, advantages, types – factors influencing plant layout – tools used for design of plant layout – principles of a good plant layout.

UNIT-IV

Production management – product design – characteristics of a good product design – design of production system – its types – design of work study – motion study – time study - production planning – objectives, levels – production control – factors determining production control operation – functions of production planning and control.

UNIT-V

Materials management – its meaning, objectives, advantages, functions – purchasing- types of purchasing policy – store keeping – organisation of stores department – inventory control – its objectives, functions, benefits.

Text Book:

1. Dr. A. Murthy, Industrial Organisation, Margham Publications, Chennai.

Reference Books:

1. L Bethel, Atwater, Smith and Stackman, Industrial Organisational Management, McGraw Hill.
2. Kimball & Kimball, Principles of Industrial Organisation, McGraw Hill.
3. Lundy, Effective Industrial Management Eurasia Publishing House (Pvt.) Ltd., New Delhi.

NON-MAJOR ELECTIVE
PAPER - 2
ADVERTISING AND SALESMANSHIP

UNIT-I

Origin and Development of Advertising – Objectives – Nature – Functions – Types – Benefits – Difference between Advertising and Publicity – Scope of Advertising – DAGMAR approach.

UNIT-II

Various media of Advertising – Print Media – Newspapers – Magazines – Advantages – Limitations – Radio and TV advertising - Advantages – Limitations.

UNIT-III

Advertisement copy – Characteristics – Clarification – Components – Salesmen Recruitment – Salesmen report – Types – Salesmanship and Psychology.

UNIT-IV

Salesmanship – Characteristics of Salesmanship – Objectives of Personal selling – Advantages – Limitations – Essentials of Effective selling – Advertising and Salesmanship.

UNIT-V

Qualities of Good Salesman – Sales Promotion – Kinds of Sales promotion – Importance of Salesmanship – Types of Salesmen – Methods of Remuneration – Qualities of successful Salesman.

Text Books:

1. Modern Marketing (Principles and Practises) R.S.N. Pillai&Bagavathi, S. Chand & Co. New Delhi
2. Sales and Advertisement Management S Rajkumar, V Rajagopalan, S. Chand & Company Pvt. Ltd.

Reference Books:

1. Advertising (Principles and Practise) Chunawalla K.C. Sethia, Himalaya Publishing House, Delhi.
2. Advertising Management Dr. M.M. Varma, R. K. Agarwal, Forward 300K Depot, New Delhi.
3. Advertising Management Mahendra Mohan, Tata Mcgraw-hill Publishing Company Limited, New Delhi, India.
4. Advertising Marketing and Sales Management G.R. Basotia N. K Sharama, Mangal Deep Jaipur.
5. Essentials of Marketing, Dr. K. Sundar, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SEMESTER – V
CORE PAPER - 13
COST ACCOUNTING – I

Objective:

To understand the basic concepts and methods of Cost Accounting.

UNIT-I: Nature and Scope of Cost Accounting

Cost Accounting : Nature and Scope – Objectives, Advantages and Limitations – Financial Vs. Cost Accounting - Costing System - Types of Costing and Cost Classification – Cost Sheet and Tenders – Cost Unit – Cost Centre and Profit Centre.

UNIT-II: Material Purchase and Control

Purchase Department and its Objectives – Purchase Procedure – Classification and Codification of Materials, Material Control: Levels of Stock and EOQ – Perpetual Inventory System, ABC and VED Analysis – Accounting of Material Losses.

UNIT-III: Methods of pricing of Material Issues

Cost Price Methods: FIFO, LIFO, Average Price Methods: Simple and Weighted Average Price Methods, Notional Price Methods: Standards Price, and Market Price Methods

UNIT-IV: Labour Cost Control

Labour Turnover: Causes, Methods of Measurement and Reduction of Labour Turnover – Idle and Over Time – Remuneration and Incentive: Time and Piece Rate – Taylor's, Merricks and Gantt's Task – Premium Bonus System – Halsey, Rowan and Emerson's Plans – Calculation of Earnings of Workers.

UNIT-V: Overheads

Classification of Overhead Costs – Departmentalization of Overheads – Allocation Absorption and Apportionment of Overhead Costs – Primary and Secondary Distribution of Overheads – Computation of Machine Hour Rate and Labour Hour Rate.

(Weightage of Marks = Problems 80%, Theory 20%)

TEXT BOOKS:

1. T.S. Reddy & Hari Prasad Reddy – Cost Accounting – Margham Publications, Chennai
2. A. Murthy and S. Gurusamy, Cost Accounting 2nd Edition, Vijay Nicole Imprints Private Ltd., Chennai.
3. A. Murthy and S. Gurusamy, Cost Accounting, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
4. Tulsian P.C. – Cost Accounting – Tata McGraw Hills.

REFERENCE BOOKS:

1. S.P. Jain and Narang – Cost Accounting – Kalyani Publishers, New Delhi
2. S.N. Maheswari – Principles of Cost Accounting – Sultan Chand & sons, New Delhi
3. A. Murthy and S. Gurusamy, Essentials of Cost Accounting, Vijay Nicole Imprints Private Ltd., Chennai.
4. S.P. Iyengar – Cost Accounting – Sultan Chand & Sons, New Delhi.

CORE PAPER - 14
PRACTICAL AUDITING

Objective:

To gain knowledge of the principles and practice of auditing.

UNIT-I

Meaning and Definition of Auditing – Nature and Scope of Auditing – Accountancy and Auditing, Auditing and Investigation – Objectives of Auditing – Limitations of Audit – Advantages of Audit – Classification of Audit

UNIT-II

Meaning and Definition of Audit Programme – Advantages and Disadvantages – Audit File, Audit Note Book, Audit Working Papers – Purposes and Importance of Working Papers – Internal Check – Meaning, Object of Internal Check – Features of Good Internal Check System – Auditors duty with regards to Internal Check System – Internal Check and Internal Audit.

UNIT-III

Vouching – Meaning – Objects – Importance of Vouching – Meaning of Voucher – Vouching of Cash Receipts and Vouching of Cash Payments – Vouching of Trading Transactions.

UNIT-IV

Verification and Valuation of assets and liabilities – Meaning and objects of verification – Vouching and verification – Verification and Valuation of different kinds of Assets and Liabilities.

UNIT-V

The Audit of Limited Companies – Necessity of Company Audit – Qualification and Disqualification of Auditors – Appointment – Removal – Remuneration – Status of Auditors – Rights – Powers – Duties and Liability of Auditors – Auditor's Report – Importance and Contents.

Text Books:

1. B.N. Tandon, Sultan Chand – A handbook of practical auditing
2. B.N. Tandon, Sudharsanam, Sundharabahu – S Chand – Practical auditing.
3. Sundar. K and Pari. K, Vijay Nicole Imprints Private Ltd., Chennai.

Reference Books:

1. Sharma, SahityaBhavan, Agra – Auditing
2. Dr.N.Premavathy, Practical Auditing, Sri Vishnu Publications, Chennai.
3. Dr.N.Premavathy, Practical Auditing (in Tamil), Sri Vishnu Publications, Chennai.

CORE PAPER - 15
BUSINESS MANAGEMENT

Objective:

To understand the basic principles of Business Management.

UNIT-I

Management – Meaning – Definition – Nature – Importance – Distinction between Administration and Management – Scope – Principles and Functions of Management.

UNIT-II

Planning – Meaning – Nature – Importance – Advantages and Limitations – Process of Planning – Types of Plans – MBO – Forecasting – Decision Making.

UNIT-III

Organising – Meaning – Definition – characteristics – Importance – Types – Authority and Responsibility – Centralisation and Decentralisation and Departmentation.

UNIT-IV

Directing – Meaning – Definition – Characteristics – Directing Process – Span of Supervision – Motivation – Leadership - Communication.

UNIT-V

Controlling – Definition – Principles – Controlling process – Types of Controls – Control Techniques - Coordination.

REFERENCE BOOKS:

1. Dr. C.B. Gupta, Business Management –Sultan Chand & Sons
2. Jayashankar, Business Management –Margham Publications, Chennai.

REFERENCE BOOKS:

1. Koontz, Weihrich and Aryasri, Principles of Management, Tata McGraw hill
2. Dr.H.C. Das Gupta, Principles & Practice of Management & Sahitya Bhawan. Agra
3. Lallan Prasad & S.S.Gulshan, Management principles and Practices & S.Chand & Co.
4. Dr.N.Premavathy, Principles of Management, Sri Vishnu Publications, Chennai.

CORE PAPER - 16

INCOME TAX LAW AND PRACTICE - I

Objective:

To enable the students to have a knowledge of law of practice of Income tax.

Unit - I: Introduction

Income Tax Act 1961- Basic Concepts – Assessment Year – Previous Year – Person – Assessee – Income – Gross Total Income – Total Income - Agricultural Income – Casual Income – Capital and Revenue Receipts – Capital and Revenue Expenditures – Exempted Incomes u/s 10.

Residential status of an individual- Residential status of a HUF – Residential status of a firm and association of persons – Residential status of a company – incidence of tax liability.

Unit - II: Salaries

Meaning and features of Salary – Allowances – Perquisites – Profits in lieu of Salary – Provident Fund and its types – payments exempted u/s 10: Leave travel concession; gratuity; pension; leave encashment; retrenchment compensation; VRS – Deductions from salary: EA and professional tax- deduction u/s 80C- taxable salary

Unit - III: Income from House Property

Annual value – Determination of annual value- Income from let out house property – Income from self-occupied house property – Deductions allowed from Income from house property u/s 24.

Unit - IV: Profit and Gains of Business or profession and depreciation

Meaning of business and profession – deductions expressly allowed – expenses expressly disallowed – treatment/ admissibility of certain expenses and incomes – income from business- income from profession.

Meaning of depreciation – conditions for depreciation – actual cost – written down value – computation of allowable depreciation.

Unit - V: Income tax authorities

CBDT – powers – Director General of income tax – Chief commissioner of income tax – Assessing officer – appointment – Jurisdiction – powers relating to search and seizure.

Note: Questions in Sec. A, B & C shall be in the proportion of 20:80 between Theory and Problems.

Text books

1. Gaur & Narang, Income Tax Law & Practice, Kalyani Publishers.
2. Dr. A. Murthy, Income Tax Law & Practice, Vijay Nicole Imprints Pvt.Ltd. Chennai
3. Reddy,T.S. & Hariprasad Reddy,Y, Income Tax Theory, Law&Practice, Margham Publications, Chennai.

Reference books

1. Mehrotra -Income Tax Law & Accounts, Sahithiya Bhavan Publications.
2. Vinod,K.Singhania, Students Guide to Income Tax,Taxman Publications Pvt. Ltd.

ELECTIVE

(To choose any 1 out of 3)

PAPER - 1

A. ENTREPRENEURIAL DEVELOPMENT

Objective:

To encourage students to become entrepreneurs.

UNIT-I

Meaning of Entrepreneur – Entrepreneur and Enterprise – Entrepreneur and Manager – Entrepreneur and Intrapreneur – Qualities (Traits) of True Entrepreneur – Characteristics of Entrepreneur – Types of Entrepreneurs – Functions of an Entrepreneur – Roles of Entrepreneurs in the Economic Development.

UNIT-II

Establishing an Enterprise – Project Identification – Selection of the Product – Project Formulation – Assessment of Project Feasibility – Preparation of Project Report – Selection of Site (Location).

UNIT-III

Selection of Types of Organization – Sole Proprietorship – Partnership Joint Stock Company – Factors Influencing the Choice of Organization – Sources of Project Finance – Sources of Long Term Finance – Sources of Short Term Finance.

UNIT-IV

Incentives and Subsidies – Meaning of Incentives and Subsidies – Need and Problems – Incentives for Development of Backward Area – Incentives for SSI Units in Backward Areas – Taxation Benefits to SSI Units – Subsidies and Incentives in Tamil Nadu.

UNIT-V

Women Entrepreneurs – Concept – Functions and Role – Problems of Women Entrepreneurs – Suggestions for Development of Women Entrepreneurs – Rural Entrepreneurship – Need – Problems – How to Develop Rural Entrepreneurship.

Text Books:

1. C.B. Gupta, Entrepreneurship development in India – Sultan Chand.
2. Gupta C.B and Srinivasan N.P. Entrepreneurial Development, Sultan Chand & Sons, New Delhi.

Reference Books:

1. P Sarvanavel, Entrepreneurial development – Ess Pee kay Publishing House.
2. S.S. Khanka, Entrepreneurial Development, S. Chand & Co., New Delhi.

ELECTIVE

PAPER - 1

B. INDUSTRIAL RELATIONS

Objective: To enable the students to learn the concepts of Industrial Relations including trade unions, collective bargaining and various labour enactments.

Unit - I: Industrial Relations (IR)

Concept of Industrial Relations; Nature of Industrial Relations; Objectives of IR; Factors affecting IR in changing Environment, Evolution of IR in India; Role of State; International Dimensions of IR.

Unit - II: Trade Union

Trade Union: Origin and growth, unions after Independence, unions in the era of liberalization; Factors affecting growth of Trade Unions in India, Major Provisions of Trade Union Act 1926.

Unit - III: Collective Bargaining and Worker's Participation in Management

Collective Bargaining: Meaning, Nature, Types, Process and Importance of Collective Bargaining Status of Collective Bargaining in India, Functions and role of Trade Unions in Collective bargaining.

Workers' Participation in Management: Consent, practices in India, Works Committees, Joint management councils; Participative Management and co-ownership; Productive Bargaining and Gain Sharing.

Unit - IV: The Industrial Disputes Act, 1947:

Definitions of Industry, workman, and Industrial Dispute; Authorities under the Act; Procedure, Powers and Duties of Authorities; Strikes and Lock outs; Lay-off and Retrenchment; Provisions relating to Layoff, Retrenchment, and closure.

Unit - V: The Factories Act, 1948:

Provisions relating to Health, Safety, Welfare facilities, working hours, Employment of young persons, Annual Leave with wages.

Text Books:

1. B. Nandhakumar, *Industrial Relations and Labour Welfare and Labour Laws* - Vijay Nicole Imprints Private Ltd., Chennai.
2. JP Sharma, *Simplified Approach to Labour Laws*, Bharat Law House (P) Ltd.

Reference Books:

1. PK Padhi, *Industrial Relations and Labour Law*, PHI Learning.
2. ArunMonalppa, *Industrial Relations and Labour Law*, McGraw Hill Education.
3. SC Srivastav, *Industrial Relations and Labour Law*, Vikas Publishing House.
4. C.S. VenkataRatnam, *Industrial Relations*, Oxford University Press.
5. P.L. Malik's *Handbook of Labour and Industrial Law*, Vol 1 and Vol 2, Eastern Book Company.

ELECTIVE

PAPER – 1

C. MANAGEMENT INFORMATION SYSTEM

Unit-I:

Management Information – Meaning of Information – Information needs of Managers – Web Data basis – Data warehousing – Knowledge management – Information system for decision making.

Unit-II:

Types of Information System – Transaction Processing System – Office Automation System – Decision Support System – Executive Support System – MIS – Evolution of MIS – Computer and MIS.

Unit-III:

System Analysis – System Planning and Mutual Investigation – System Design - The Process and Stages of System Design – Input / Output forms Design – File Organisation – System Implementation.

Unit-IV:

Management Information Needs and Communication links for Marketing system, Production System, Accounting System, Manufacturing System, Inventory Control System and Budget Control System - IS Organisation – Top Management Responsibility – Processing Group Responsibility.

Unit-V:

Development – Maintenance of MIS – Operation of manual Information System – Role of Computer in MIS – Data base Concept – Expert Systems – System Audit.

Text Book:

1. M. Assam – Fundamentals of Management Information System – Vijay Nicole Imprints Private Ltd., Chennai.
2. Effy Oz, “Management Information Systems”, Second edition, Thomson Learning Course Technology, 2002.
3. Jawadekar W.S, “Management Information Systems”, Tata McGraw Hill Publishing Company Ltd, 2002.
4. Kenneth.C Laudon and Jane P. Laudon, “Management Information Systems”, Prentice Hall of India Ltd, 2002.

Reference Books:

1. David Knoenke (1989), “Management Information Systems”, Tata McGraw Hill, New Delhi.
2. Iandon K.C and Landon J.P (2001), “Management Information Systems’, Maxwell Macmillan Publishing Company.
3. Murdic Rose and Elaggett, “Information System for Modern Management, Prentice Hall.
4. Robert Schultheis, Mary Sumner, “Management Information Systems” – The Manager’s View, Fourth edition, Tata McGraw Hill Edition, 1999

SKILL BASED SUBJECT
PAPER - 3
PRINCIPLES OF MARKETING

Objective:

To enable the students to understand the concept and importance of marketing and the developments that have taken place in the field of marketing in the global scenario.

Unit - I Introduction

Meaning of market – classification of markets- meaning and definition of marketing- features of marketing – importance of marketing – difference between marketing and selling – Evolution of marketing concepts - functions of marketing.

Unit - II Market Segmentation and Consumer Behaviour

Meaning and definition of market segmentation – different patterns of market segmentation – Bases for segmenting consumer markets – benefits and limitations of market segmentation

Definition of consumer behaviour - consumer behaviour theories - factors determining consumer behaviour.

Unit - III Marketing Mix and Product policy

Definition and components of marketing mix - four P's of marketing mix - definition of product - features of a product - classification of products - stages in new product development - product life cycle – Branding – advantages of branding a product - packaging – functions of package – labelling – functions of labelling – kinds of labels.

Unit - IV Pricing policy, Channel of distribution and Promotion Mix

Meaning of price – factors affecting price decision – Types of pricing strategies - definition of channel of distribution – features of marketing channels – types of Channel of distribution - factors determining Channel of distribution - functions of wholesalers – types of retailers – promotion mix – Advertising – types of advertising – personal selling – qualities of a good salesman – sales promotion – kinds of sales promotion.

Unit - V Recent trends in Marketing

Social marketing – De-marketing – Re – marketing – Over marketing – Meta marketing – E- Marketing – online retailing – shopping malls.

Text Books:

1. Rajan Nair, Marketing, Sultan Chand & Sons , New Delhi
2. Varshney, Marketing Management, Sultan Chand & Sons , New Delhi.

Reference Books:

1. Jaisankar, Marketing, Margham Publications, Chennai
2. L. Natarajan, Marketing, Margham Publications, Chennai
3. Dr. K. Sundar, Essentials of Marketing, Vijay Nicole Imprints Private Ltd., Chennai.

SEMESTER – VI
CORE PAPER - 17
COST ACCOUNTING II

Objective:

To understand the basic concepts and methods of Cost Accounting.

UNIT-I

Job, Batch, Contract Costing: Job Costing – definition – Features – Procedure – WIP – Cost Accumulation, Batch Costing – EBQ, Contract Costing – Definition, Features, Work Certified and Uncertified – Incomplete Contract – Escalation Clause – Cost Plus Contract – Contract Account

UNIT-II

Process Costing : Definition – Features – Job Vs Process Costing – Process Account – Losses – By Products and Joint Products – WIP – Equivalent Units and its Calculation - Closing WIP with or without Process Loss.

UNIT-III

Operating Costing (Transport Costing): Cost Unit – Cost Classification – Operating Cost sheet.

UNIT-IV

Marginal Costing: Definition – Advantages and Limitation – Break Even Point – Margin of Safety – P/V Ratio – Key factor – Make or Buy Decision – Selection of Product Mix – Changes in Selling Price – Foreign Market Offer – Desired Level of Profit.

UNIT-V

Reconciliation of Cost and Financial Accounts.

(Weightage of Marks = Problems - 80%, Theory - 20%)

TEXT BOOKS:

1. T.S. Reddy & Hari Prasad Reddy – Cost Accounting – Margham Publications, Chennai
2. A. Murthy and S. Gurusamy, Cost Accounting 2nd Edition, Vijay Nicole Imprints Private Ltd., Chennai.
3. A. Murthy and S. Gurusamy, Cost Accounting, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
4. Tulsian P.C. – Cost Accounting – Tata McGraw Hills.

REFERENCE BOOKS:

1. S.P. Jain and Narang – Cost Accounting – Kalyani Publishers, New Delhi
2. S.N. Maheswari – Principles of Cost Accounting – Sultan Chand & sons, New Delhi
3. S.P. Iyengar – Cost Accounting – Sultan Chand & Sons, New Delhi.

CORE PAPER - 18
MANAGEMENT ACCOUNTING

Objective:

To enable the students to gain knowledge in the application of accounting to Management.

UNIT-I

Management Accounting: Definition – objectives - Functions – Advantages and limitations – Financial Statement Analysis – Comparative and Common size statements – Trend Analysis.

UNIT-II

Ratio Analysis : Definition – Significance and Limitations – Classification – Liquidity, Solvency, Turnover and Profitability ratios – Computation of Ratios from Financial Statements – Preparation of Financial Statement from Ratios.

UNIT-III

Fund Flow and Cash Flow Analysis: Concept of Funds, Sources and Uses of Funds – Fund Flow Statement – Concept of Cash Flow – Cash Flow Statement as Per AS3.

UNIT-IV

Standard Costing – Variance Analysis – Material – Labour – Overheads – Fixed - Variable Sales Variance.

UNIT-V

Budget and Budgetary Control: Definition – Objectives – Essentials – Uses and Limitations – Preparation of Material Purchase, Production, Sales, Cash and Flexible Budget – Zero Base Budgeting.

(Weightage of Marks - Problems - 80%, theory - 20%)

Reference Books:

1. S.N.Maheswari, Management Accounting – Sultan Chand & Sons, New Delhi.
2. A.Murthy and S.Gurusamy, Management Accounting, Tata Mc-Graw Hill Publishing Company, New Delhi.

Reference Books:

1. Manmohan&Goyal, Management Accounting – SahithiyaBhavan, Agra.
2. S.P.Gupta, Management Accounting – Sultan Chand & Sons, New Delhi.
3. R.S.N.Pillai&Bhagavathi, Management Accounting – S.Chand& Co. Ltd., New Delhi.
4. T.S.Reddy&Hari Prasad Reddy, Management Accounting – Margham Publications, Chennai.

CORE PAPER - 19
INCOME TAX LAW AND PRACTICE – II

Objective:

To enable the students to have a knowledge of law of practice of Income tax.

Unit I: Capital gains

What are capital assets? – what are not capital assets? – kinds of capital assets – transfer u/s 2 (47) – cost of acquisition – cost of improvement – computation of short term capital gain - computation of long term capital gain – exemptions from capital gains.

Unit II: Income from other sources

Specific incomes chargeable to tax – general incomes chargeable to tax – Interest on securities – Interest exempt from tax u/s 10 (15) - deductions allowed from Income from other sources – computation of income from other sources.

Unit III: Clubbing of Incomes and Set off and carry forward of losses

Income transfer without asset transfer – cross transfer –transfer for the benefit of son's wife – capital gain on an asset gifted before marriage – gifted money used for construction of house by spouse – income including losses – clubbing of business income – clubbing of minor's income – computation of total income.

Provisions relating to set off of losses- Provisions relating to set off and carry forward of losses – unabsorbed depreciation – order of set off – computation of total income.

Unit IV: Agricultural Income and Deductions from gross total income

Meaning of agricultural income – types of agricultural income – income from growing and manufacturing rubber - income from growing and manufacturing coffee - income from growing and manufacturing tea – income of a sugar mill growing its own sugarcane – computation of tax of an assessee having agricultural income.

Permissible deductions from gross total income – section 80C, 80CCC, 80CCD, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGA, 80QQB, 80RRB, 80U.

Unit V: Assessment of Individuals and Assessment procedures

Sources of income of an individual – computation of total income and tax liability of an individual.

Filing of returns – permanent account number (PAN) –Usage of PAN – TDS - types of assessment – self assessment – Best judgement assessment – Income escaping assessment (reassessment) – Advance payment of tax

Note: Questions in Sec .A, B & C shall be in the proportion of 20:80 between Theory and Problems.

Text books

1. Gaur & Narang, Income Tax Law & Practice, Kalyani Publishers.
2. Murthy.A, Income Tax Law & Practice, Vijay Nicole Imprints Pvt. Ltd. Chennai
3. Reddy,T.S.& Hariprasad Reddy, Y, Income Tax Theory, Law & Practice, Margham Publications, Chennai.

Reference books

1. Mehrotra-Income Tax Law & Accounts, Sahithiya Bhavan Publications.
2. Vinod,K.Singhania, Students Guide to Income Tax, Taxman Publications Pvt.Ltd.

ELECTIVE

PAPER - 2

A. FINANCIAL MANAGEMENT

UNIT-I

Nature and Importance of Finance Functions – Organizing Finance Functions – Functions of Finance Manager – Objectives of Finance Function – Methods and Sources of Raising Finance – Critical Appraisal of the Various Sources of Finance.

UNIT-II

Goals of Finance Function – Financing Decisions – Financial Planning – Financial Forecasting – Capital Structure Decisions – Capitalization – Cost of Capital – Dividend Policy

UNIT-III

Investment Decisions – Estimation of Cash Flows – Evaluation of Alternative Investment Proposals like NPV, ARR, IRR Methods – Decision Making Under Risk and Uncertainty – Inflation and Investment Decisions

UNIT-IV

Working Capital – Gross and Net Working Capital – Determinants of Working Capital – Sources of WC – Credit and Collection Policies.

UNIT-V

Security Analysis and Portfolio Management - Leverages – Financial Ratio Analysis.

(Weightage of Marks = Problems - 60%, Theory - 40%)

Reference Books:

1. Dr. S.N.Maheswari, Financial Management, Sultan Chand & Sons, New Delhi.
2. Dr. A.Murthy, Financial Management, Margham Publications, Chennai.
3. Dr. J. Srinivasan, Sridhar and Ramalingam, Financial Management, Vijay Nicole Imprints Pvt .Ltd. Chennai

Reference Books:

1. I.M.Pandey, Financial Management.
2. Prasanna Chandra, Financial Management.
3. Subirkumar Banerjee, Financial Management.
4. Vyuptakesh Sharan, Fundamentals of Financial Management.
5. Dr .N. Premavathy, Financial Management, Sri Vishnu Publications, Chennai.

ELECTIVE

PAPER - 2

B. BUSINESS ENVIRONMENT

UNIT-I

The concept of Business Environment - Its nature and significance - Brief overview of political - Cultural - Legal - Economic and social environments and their impact on business and strategic decisions.

UNIT-II

Political Environment - Government and Business relationship in India - Provisions of Indian constitution pertaining to business

UNIT-III

Social Environment - Cultural heritage - Social attitudes - impact of foreign culture - castes and communities - Joint family systems - Linguistic and Religious groups - Types of Social Organization

UNIT-IV

Economic Environment - Economic Systems and their impact of Business - Macro Economic Parameters like GDP - Growth Rate - Population - Urbanization - Fiscal deficit - Plan investment - Per capita Income and their impact on business decisions

UNIT-V

Financial Environment - Financial System - Commercial banks - RBI - IDBI - Non-Banking Financial Companies NBFC's

Text Books:

1. Dr. S. Sankaran - Business Environment. Margham Publications, Chennai
2. Aswathappa - Business Environment, Himalaya Pub. House, 2009.

Reference Books:

1. Dasgupta and Sengupta - Government and Business in India.
2. Srinivasan K - Productivity and Social Environment.
3. International Business Environment - Prentice - Hall of India.
4. Dhana bakiyam & M. Kavitha, Business Environment, Vijay Nicole Imprints Pvt .Ltd. Chennai.

ELECTIVE

PAPER - 2

C. OFFICE MANAGEMENT

UNIT-I

Meaning and scope -Function and qualifications of Office Manager -Poor and good organization Departments -Flow of Work -Organization Charts and manual

UNIT-II

Administrative arrangements and physical conditions - Centralization and Decentralization of Office services - Office Accommodation and Layout -Office Furniture - Meaning of Various terms - Basic pattern of work -Sub-division - Standardization and Standards - Work Measurement and control

UNIT-III

Office equipments - Reproduction equipments - Typewriter - Duplicators - Photo Copier - Franking Machine - Communication Equipments - Dictaphone - Intercom - Telephone - Telex - Teleprinters - PABX - PBX - STD - Storage equipments - Filing Cabinets - Time Clocks - Use of Computers in Office Management
Office System - Procedure - Routine - And methods - Paper work in office Filing functions - essentials of good filing systems - Central vs. Departmental Filing classification - Methods of filling Old and Modern - Micro filing - Indexing Types.

UNIT-IV

Mail service and communication - Office Correspondence - Central vs. Departmental Correspondence - Handling Mail - Postal Services - Postbag and Post Box Numbers - Registered and Insured Posts - VPP Communications - Oral written - Internal and external communication - Records Management Types - Forms Controls - Principles - Foremost - Continuous stationery

UNIT-V

Office Supervisor - Meaning and characteristics of Supervisor - Status - Place and Role of Supervisor - Effective Supervisor - Qualification - Knowledge and skill of Supervisor.

Text Books:

1. Pillai R.S.N, Bhagwathi. V - Office Management, S.Chand, New Delhi.
2. Arora SP - Office Management, Vikas Publications Pvt. Ltd., Chennai.

Reference Books:

1. Dr.T.S. Devanarayan, N.S.Raghunathan - Office Management.
2. Balachandiran. V and Chandrasekaran, Office Management, Vijay Nicole imprints Private Limited, Chennai.

ELECTIVE

(To choose any 1 out of 3)

PAPER - 3

A. HUMAN RESOURCE MANAGEMENT

Objective:

To enable the students to recognize that the Human beings are the important assets in the organisation and to replace the term personnel by Human Resource Management.

To make the students to acquire knowledge about the development of Human Resource Management which is crucial for quality productivity and growth.

UNIT-I

Nature and scope of HRM – personnel Management and HRM – Functions of HRM – Functions of HR Manager – HRM as a profession – Indian perspective

UNIT-II

Human Resource Planning – Recruitment – Selection – Methods of Selection – Use of Various tests – Interview techniques in selection – Induction - Placement

UNIT-III

Training methods – Techniques – Identification of training needs.

UNIT-IV

Job satisfaction – Motivation (Maslow's and Two Factor Theory only) – Performance Appraisal – Methods – Compensation – Incentives – Monetary and Non-Monetary

UNIT-V

Transfer – Promotion and Termination of Services – Career Development - Monitoring

TEXT BOOKS:

1. Dr.K.Sundar&Dr.J.Srinivasan, Human Resource Management, Vijay Nicole Publications, Chennai.
2. C B Gupta, Human Resource Management, S.Chnd, New Delhi.
3. Aswathappa, Human Resource and Personnel Management, Vikas Publications Pvt. Ltd., Chennai.

REFERENCE BOOKS:

1. Dr.K.Sundar & Dr.J.Srinivasan, Human Resource Development, Margham Publications, Chennai.
2. J. Jayasankar, Human Resource Management, Margham Publications, Chennai.
3. Dr. N. Premavathy, Human Resource Management & Development, Sri Vishnu Publications, Chennai.

ELECTIVE
PAPER - 3
B. FINANCIAL SERVICES

Objective:

To enable the students to gain knowledge of business financial services.

UNIT-I

Financial services – meaning – Financial services and economic environment – legal and regulatory framework – financial institutions and other participants in the financial services sector – capital and money markets – Instruments – Government – Securities market – SWAP Analysis

UNIT-II

Introduction to leasing – legal and tax aspects – lease evaluation – Merits and Demerits – Accounting and Reporting for Lease – lease funding – Types of lease – Lease agreement – Hire purchase Vs lease – Legal aspects of Hire purchase – rights and duties of hire vendor and hire purchaser.

UNIT-III

Factoring – Types and feature of factoring agreement – Factoring Vs Bills discounting – Services of factor – Consumer Finance and credit card services – forfeiting.

UNIT-IV

Venture capital – meaning and characteristics – criteria for assistance – schemes and guidelines – infrastructure financing – assessment of risk – legal aspects.

UNIT-V

Mutual funds – SEBI Guidelines – Features and types – Management structure and performance evaluation – Growth and recent trends – Investor services – Credit rating agencies – CRISIL, CARE, ICRA – Services – Criteria for rating – Symbols.

Text Books:

1. Dr.S.Gurusamy, Financial Services, Vijay Nicholes Imprint Pvt. Ltd., 2004 – Chennai

Reference Books:

1. Dr.V.Balu, Merchant Banking & Finance Services, Sri Venkateswara Publication, Chennai.
2. Dr.S.Gurusamy, Financial Services and Systems, Vijay Nicholes Imprint Pvt. Ltd., 2004 – Chennai
3. Dr.S.Gurusamy, Essentials of Financial Services, 2nd Edition, Vijay Nicholes Imprint Pvt. Ltd.,– Chennai
4. Dr. N. Premavathy, Financial Services and Stock Exchange, Sri Vishnu Publications, Chennai.

ELECTIVE

PAPER – 3

C. PORTFOLIO MANAGEMENT

UNIT-I

Portfolio Regulation and Management – Need – Traditional Approach – Efficient Market Hypothesis – Approaches to Portfolio Theory and Practices – Need for costing – Share Costing – Risk and Return.

UNIT-II

Portfolio Analysis – Theory and Practices – Risk Analysis – Types of Risks – Risk Management – Diversification of risk – Analysis of risk – Building a balanced portfolio.

UNIT-III

Characteristics of portfolio – Principles and Practices – Characteristics of Portfolio Analysis – Liquidity Vs. Safety – Income Vs. growth – Short Term and Long Term – Risk Vs. Return – Need for insuring risk to attract stable investors.

UNIT-IV

Revision of Investment Portfolio – Diversification of Investment Portfolio – International Scenario influencing portfolio – Need for reviewing portfolio constantly.

UNIT-V

Regulation of Investment Portfolio – Evaluation of investments in terms of market trends – Shape of Optimal Portfolio – Need for Investment Consultancy – Importance of Computer data Analysis for Security Analysis and Portfolio Analysis.

Text Books:

1. Dr. S. Guruswamy, Security Analysis and Portfolio Management, Vijay Nicholes Imprint Pvt. Ltd., – Chennai.
2. V. K. Bhalla, Portfolio Analysis and Management, Sultan Chand & Sons
3. PunithavathyPandian, Security Analysis and Portfolio Management, Vikas Publishing House Pvt. Ltd.

Reference Books:

1. **I. M. Pandey**, Financial Management, Vikas Publishing House Pvt. Ltd. Chennai.
2. Fischer & Jordan, Security Analysis and Portfolio Management, Prentice Hall India.
3. V. A. Avadhani, Investment and Securities Market in India, Himalaya Publishing House.

SKILL BASED SUBJECT

PAPER - 4

COMPUTER APPLICATION IN BUSINESS

Objective:

To provide basic knowledge of computer applications in business.

UNIT-I

Introduction to Computer—Characteristicsof a Computer —History of Computer—
Computer generation - Hardware—Software – System Software and application software.

UNIT-II

MS - Word Processing: Starting MS word - MS word environment - working with word documents, text, tables - checking spelling and grammar - printing a documents.

UNIT-III

MS Excel - MS Excel Sheet - MS Excel environment - Working with Excel workbook - worksheet - Formulas and functions - Inserting charts - printing in Excel.

UNIT-IV

MS Power Point - Starting MSPower Point - MS power point environment - working with power point - working with different views – designing, presentation &printing in Power Point.

UNIT-V

Electronic Commerce - Types - Advantages and Disadvantages - Electronic data interchange (EDI) working of EDI - EDI benefits &Limitations - SMART card - SMART card applications.

TEXT BOOK

1. AnanthiSheshasaayee: Computer Application in Business and Management, Margam Publication.
2. Leon & Leon, Computer Applications in Business, Vijay Nicholes Imprint Pvt. Ltd.,– Chennai

REFERENCE BOOK

3. A. Zakiudeen Ahmed: Computer Application in Business, Margam Publication.

Question Paper Pattern:

| Pattern | Total Questions | To answer | Marks per Question | Total Marks |
|-----------|-----------------|-----------|--------------------|-------------|
| Section A | 10 | 10 (All) | 2 | 20 |
| Section B | 8 | 5 | 5 | 25 |
| Section C | 5 | 3 | 10 | 30 |

Instructions to Paper Setter:

Section-A: Minimum 2 Questions to be asked from each of the five Units

Section-B: Minimum 1 Question to be asked from each of the five Units.

Section-C: 1 Question to be asked from each of the five Units.

THIRUVALLUVAR UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS
DEGREE COURSE
CBCS PATTERN
(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|------------------|-------------|----------------------|--------|----------------------------------|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER I | | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper -1 | 6 | 6 | Digital Logic & Programming in C | 25 | 75 | 100 |
| 4 | III | Core Practical | Practical-1 | 3 | 2 | Programming in C Lab | 25 | 75 | 100 |
| 5 | III | ALLIED-1 | Paper-1 | 7 | 4 | Mathematical Foundations - I | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Science | 25 | 75 | 100 |
| | | | | 30 | 22 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | CIA | Uni. Exam | Total |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-2 | 6 | 6 | C++ & Data Structure | 25 | 75 | 100 |
| 10 | III | Core Practical | Practical-2 | 3 | 2 | C++ and Data Structures Lab | 25 | 75 | 100 |
| 11 | III | ALLIED-1 | Paper-2 | 7 | 6 | Mathematical Foundations - II | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | III | Core Theory | Paper-3 | 5 | 3 | Java Programming | 25 | 75 | 100 |
| 15 | III | Core Theory | Paper-4 | 4 | 4 | E-Commerce | 25 | 75 | 100 |
| 16 | III | Core | Paper-5 | 5 | 4 | Resource Management | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|---------------------|-------------|----------------------|--------|--|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| | | Theory | | | | Techniques | | | |
| 17 | III | Core Practical | Practical-3 | 4 | 3 | Java Programming Lab | 25 | 75 | 100 |
| 18 | III | ALLIED-2 | Paper-3 | 7 | 4 | Financial Accounting - I | 25 | 75 | 100 |
| 19 | IV | Skill based Subject | Paper-1 | 3 | 3 | Design and Analysis of Algorithm | 25 | 75 | 100 |
| 20 | IV | Non-major elective | Paper-1 | 2 | 2 | Introduction to Information Technology | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 21 | III | Core Theory | Paper-6 | 5 | 3 | Database Management Systems | 25 | 75 | 100 |
| 22 | III | Core Theory | Paper-7 | 4 | 4 | Enterprise Resource Planning | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-8 | 5 | 4 | Decision Support System | 25 | 75 | 100 |
| 24 | III | Core Practical | Practical-4 | 4 | 3 | RDBMS Lab | 25 | 75 | 100 |
| 25 | III | ALLIED-2 | Paper-4 | 7 | 6 | Financial Accounting - II | 25 | 75 | 100 |
| 26 | IV | Skill based Subject | Paper-2 | 3 | 3 | Computer Organisation and Architecture | 25 | 75 | 100 |
| 27 | IV | Non-major elective | Paper-2 | 2 | 2 | Internet and its applications | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 28 | III | Core Theory | Paper-9 | 6 | 3 | Mobile Application Development | 25 | 75 | 100 |
| 29 | III | Core Theory | Paper-10 | 6 | 3 | Operating System | 25 | 75 | 100 |
| 30 | III | Core Theory | Paper – 11 | 4 | 2 | Data Communication & Network | 25 | 75 | 100 |
| 31 | III | Core Practical | Practical-5 | 4 | 3 | Mobile Applications Development - Lab | 25 | 75 | 100 |
| 32 | III | Core Practical | Practical-6 | 4 | 3 | Operating System - Lab | 25 | 75 | 100 |
| 33 | III | Elective I | Paper-1 | 3 | 3 | A. Data Mining | 25 | 75 | 100 |

| S.No. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|-------------------------|-------------|----------------------|--------|--|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| | | | | | | B. Computer Graphics C. Information Security | | | |
| 34 | IV | Skill Based Subject III | Paper-3 | 3 | 3 | Software Engineering | 25 | 75 | 100 |
| | | | | 30 | 20 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 35 | III | Core Theory | Paper-12 | 7 | 5 | Cloud Computing | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper-13 | 6 | 4 | Open Source Programming | 25 | 75 | 100 |
| 37 | III | Core Practical | Practical-7 | 4 | 3 | ASP .NET Lab | 25 | 75 | 100 |
| 38 | III | Core Practical | Practical-8 | 4 | 3 | Open Source Programming - Lab | 25 | 75 | 100 |
| 39 | III | Elective II | Paper-2 | 3 | 3 | A. Software Testing B. Mobile Computing C. Microprocessor | 25 | 75 | 100 |
| 40 | III | Elective III | Paper-3 | 3 | 3 | A. Internet of Things B. System Software C. Multimedia Systems | 25 | 75 | 100 |
| 41 | IV | Skill Based Subject IV | Paper-4 | 3 | 3 | ASP .NET | 25 | 75 | 100 |
| 42 | V | Extension Activities | | 0 | 1 | | 100 | 0 | 100 |
| | | | | 30 | 25 | | 275 | 525 | 800 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|-------------|------------------------|---------------|---------------|----------------------|--------------------------|--------------------|
| Part I | Languages | 2 | 4 | 8 | 100 | 200 |
| Part II | English | 2 | 4 | 8 | 100 | 200 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100+100 (I + III SEM) | 200 |
| | Allied (Even Semester) | 2 | 6+6 | 12 | 100+100 (II + IV SEM) | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 13 | (3-6) | 51 | 100 | 1300 |
| | Core Practical | 8 | (2-3) | 22 | 100 | 800 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 42 | | 140 | | 4200 |

THIRUVALLUVAR UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS
SYLLABUS
UNDER CBCS

(with effect from 2017 - 2018)

SEMESTER I

PAPER – 1

Digital Logic & Programming in C

Objective :

Provide basic knowledge on Digital Electronics to understand the working principles of Digital computer and to develop programming skill using C language .

UNIT I: Number systems and Boolean Algebra

Number Systems -Decimal, Binary, Octal, Hexadecimal and their inter conversions, - Binary Arithmetic -1's complement, 2's complement and 9's complement .Binary codes - BCD, Excess-3, Graycode.

Boolean Algebra : Boolean Laws - Simplification of Boolean Functions - Logic gates and Truth Table – Universal Gates (NAND and NOR) - The K-map method up to five variables, don't care conditions, POS & SOP forms.

UNIT-II: Combinational and Sequential Circuits

Combinational Logic: Half/Full adder/subtractor , code conversion, Multiplexers,demultiplexers, encoders, decoders, Combinational design using MUX & DEMUX. BCD adder, magnitude comparator.**Sequential logic**: Flip flops (RS, Clocked RS, D, JK, JK Master Slave)-Counters & types Synchronous and Asynchronous counters- Registers, Shift registers and their types.

UNIT –III: C Basics and Control constructs

C fundamentals- Operators- Constants- Expression – Library functions- Decision making and branching- Switch- FOR,WHILE, DO WHILE loops- Continue- break

Unit IV: Arrays, Functions and Structures

Arrays-Multi dimensional arrays- User defines functions- Call by Value and reference- Recursion- Storage classes- Structures and Union –Self referential structures

Unit – V: Pointers and Files

Pointers- Pointer operations and Arithmetic- File management in C :File opening and closing- - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

Text Book:

1. Morris Mano M. “**Digital Logic and Computer Design**”, PHI Latest Pub. Ed. (Unit I and 2)
2. ReemaThareja,” **Programming in C** “ Oxford University Press

Reference Book

1. Albert Paul Malvino, Donald P Leach, **Digital principles and applications**TMH,1996.
2. Balagurusamy,” Programming in C” TMH

CORE PRACTICAL – I
PROGRAMMING IN C- LAB

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5. nP_r , nC_r in a single program using function
6. Matrix Addition, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

ALLIED
PAPER - I
MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}, \lim_{x \rightarrow 0} \frac{\sin x}{x}, \lim_{x \rightarrow 0} \frac{\tan x}{x}, \lim_{x \rightarrow 0} \frac{e^x - 1}{x}, \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n, \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication,
Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian& Others, Analytical Geometry 2 Dimension - Emerald publication 1992 Reprint.
4. Manicavachagompillay&Natarajan. Analytical Geometry part I - Two Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER II
CORE THEORY PAPER – 2
C++ AND DATA STRUCTURE

Objective: To develop Object oriented programming skills using C++ and to introduce data structure concepts.

UNIT-I : Object Oriented Concepts and C++

C++ Fundamentals - Operators, Expressions and Control Structures: If, If..Else, Switch - Repetitive Statements- for, while, do..while - Input and Output in C++ - manipulators-manipulators with parameters. - Pointers and arrays

UNIT-II : Functions and Classes

Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading.
Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

UNIT – III : Inheritance, Polymorphism & Files

Inheritance : Single Inheritance - Multilevel inheritance - Multiple inheritance - Hierarchical Inheritance - Hybrid Inheritance - Polymorphism - Working with Files : Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - Updating a File - Error Handling during File Operations .

UNIT-IV : Fundamental Data Structures

Definition of a Data structure - primitive and composite Data Types, Stacks (Array) - Operations –Linked Stack-Operations- Applications of Stack (Infix to Postfix Conversion).

Queue (Array)- operations-Linked Queue- Operations- - Singly Linked List - Operations, Application of List (Polynomial Addition)-. Doubly Linked List - Operations.

UNIT-V : Trees and Graphs

Trees: Binary Trees –Binary Search Tree- Operations - Recursive Tree Traversals- Recursion
Graph - Definition, Types of Graphs, Graph Traversal –Dijkstras shortest path- DFS and BFS.

Text Books

1. Mastering in C++, K.R.Venugopal, Raj Kumar, T.Ravisankar – McGraw Hill, 2011.
2. C++ Plus Data Structure by Nell Dale ,Narosa Publications, 2000

Reference Books:

- 1.ReemaThareja , Object Oriented Programming with C++, Oxford University Press, 2015
2. Balagurusamy, c++ programming, TMH.
3. Fundamentals of Data Structures in C++ by Ellis Horowitz, SartajSahni and Dinesh Mehtha, Second Edition, University Press
4. Data Structures using C++ byVarshaH.Patil. Oxford University Press, 2012

PRACTICAL – II
C++ & DATA STRUCTURE - LAB

1. Implementing classes, object, constructors and member functions for calculating area and perimeter of a circle.
2. Implementing function overloading(Find area/volume of rectangle, circle, sphere, cylinder, cone etc).
3. Implementing operator over loading(Addition, subtraction, multiplication of matrices)
4. Implementing single , multiple , hierarchical inheritance.
5. Implementing sequential file operations using error handling functions.
6. Implementing PUSH, POP operations of stack using Arrays.
7. Implementing add, delete operations of a queue using Arrays.
8. Implementing Infix to postfix conversion of an expression using stack
9. Implementing Binary tree recursive traversals (in-order, pre-order, and post-order).
10. Implementing Polynomial addition using linked list.

ALLIED II

MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermitian, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

- (i) Cramer's rule.
- (ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line $y=x$, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

$$\frac{1}{ax^2+bx+c}, \frac{1}{\sqrt{ax^2+bx+c}}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \frac{px+q}{ax^2+bx+c}, \frac{px+q}{\sqrt{ax^2+bx+c}}$$

integrations using simple substitutions integrations involving trigonometric functions of the form

$$\frac{1}{a+b\cos x}, \frac{1}{a^2\sin^2 x + b^2\cos^2 x}, \text{ Integration by parts.}$$

UNIT-IV

Properties of definite integrals. Reduction formulae for

$\int x^n e^{ax} dx$, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane curves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram & Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian & Others, Analytical Geometry 3 Dimension – Emerald publication 1992 Reprint.
4. Manicavachagompillay & Natarajan. Analytical Geometry part II - three Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER III
CORE THEORY PAPER – 3
JAVA Programming

Objectives:

To improve Object Oriented Programming gathered already through an independent platform.

Unit – I: BASICS, ESSENTIALS, CONTROL STATEMENT AND CLASSES & OBJECTS

Computer and its Languages – Stage, Origin and Features for Java - JDK–OOP; Java Essentials: Program – API - Variables & Literals - Data Types - String Class – Operators - Type conversion - Constants - Scope – Comments - Keyboard Input; Control Statements: Conditional Statements – Looping Statements - Break and Continue Statements; Classes and Objects: Modifiers - Arguments - Constructors - Packages and import - Static Class - Overloaded Methods and Constructors - Returning Objects – toString() - this reference – Enumeration - Garbage Collection.

Unit – II: ARRAYS, INHERITANCE, INTERFACES AND PACKAGES

Arrays - Three or More Dimensions; Inheritance: Basics - Calling the Superclass Constructor - Overriding Superclass Methods - Inheritance from Subclasses – Polymorphism - Abstract Classes and Methods - Interfaces: Fields - Multiple inheritance - Interface inheritance; Packages: Creating packages – Accessing package from other packages - Access Specifier.

Unit – III: STRING HANDLING, EXCEPTION HANDLING AND MULTITHREADING

String Handling: Basics - Operations –String Methods - String Buffer class - String Builder – toString method -String Tokenizer class. Exception Basics: try and catch block - Multiple catch block - Nested try - throws keyword - Throw vs Throws - Final vs Finally vs Finalize - Method Overriding - Custom Exception - Multithreading: Life Cycle - Methods in Thread - thread application – Thread priority – Synchronization - Inter-thread communication - Suspending, Resuming, and Stopping Threads;

Unit – IV: APPLET AND GUI APPLICATION

Applets: Basis - Lifecycle - Applet classes - Application – Graphics; AWT-I: GUI Programming - AWT classes - Windows fundamentals- Creating Windows - Dialog Boxes - Layout Managers - Radio Buttons and Check Boxes – Borders-Swing

Unit – V: JAVA DATABASE CONNECTIVITY

JDBC - Types of Drivers- Architecture- Classes and Interfaces - Developing JDBC Application - New Database and Table with JDBC - Working with Database Metadata.

Text Book

1. S.Sagayaraj, R.Denis, P.Karthik & D.Gajalakshmi, “Java Programming“, Universities Press, 2017

References

1. Patrick Naughton and Herbert Schildt. “The Complete Reference JAVA 2”. 3rd Edition. Tata McGraw-Hill Edition, 1999.
2. Muthu C. “Programming with JAVA”. 2nd Edition. Vijay Nicole Imprints, 2011.
3. Ken Arnold Gosling and Davis Holmen. “The Java Programming Language”. 3rd Edition. Addition Wesley Publication.

CORE THEORY PAPER – 4

E-Commerce

UNIT-I

Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E-commerce applications.

UNIT-II

Network infrastructure for E-Commerce - components of the I-way - Global information distribution networks - public policy issues shaping the I-way. The internet as a network infrastructure. The Business of the internet commercialization.

UNIT-III

Network security and firewalls - client server network security - firewalls and network security - data and message security - encrypted documents and electronic mail.

UNIT-IV

Electronic Commerce and world wide web, consumer oriented E-commerce, Electronic payment systems, Electronic data interchange (EDI), EDI applications in business, EDI and E-commerce EDI implementation.

UNIT-V

Intraorganizational Electronic Commerce supply chain management.
Electronic Commerce catalogs, Document Management and digital libraries.

Text Book

1. R. Kalakota and A. B. Whinston, Frontiers of Electronic Commerce, Addison Wesley, 1996.

Reference Books

1. R. Kalakota and A. B. Whinston, Readings in Electronic Commerce, Addison Wesley, 1997.
2. David Kosiur, Understanding Electronic Commerce, Microsoft Press, 1997.
3. E-Commerce and E-Business, P. Rizwan Ahmed, Margham Publications.

CORE THEORY PAPER – 5

RESOURCE MANAGEMENT TECHNIQUES

Objectives: To improve the skills of solving very common problems which we come across in various fields like transportation and industries with machines. To develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions.

UNIT – I: Introduction and Linear Programming

BASICS OF OPERATIONS RESEARCH: Development – Definition – Characteristics – Phases – Models – Advantages and Limitations **LINEAR PROGRAMMING :** Formulation – Graphical Method of Solution – General Linear Programming Problem – Canonical and Standard form of LPP – Simplex method.

UNIT – II: Transportation and Assignment Model

TRANSPORTATION MODEL : Definition – Formulation and Solution – Additional Problems **ASSIGNMENT MODEL :** Definition – Solution of Assignment Models – Hungarian Method – Additional Problems – Traveling Salesman problem.

UNIT – III : SEQUENCING MODLES

Sequencing Problems – Assumptions – Processing n jobs through two machines – Processing n jobs through three machines – Processing of two jobs through m machines.

UNIT – IV: REPLACEMENT MODELS

Introduction – Replacement of items that deteriorate – Replacement of items whose maintenance and repair cost increase with time – Replacement of items that fail suddenly – group replacement policy.

UNIT – V: NETWORKING ANALYSIS

Project – Project Planning – Project Scheduling – Project Controlling – Activity on Node diagram – Critical Path Method – Program Evaluation and Review Technique

TEXT BOOK

Operations Research, P. K. Gupta and D.S. Hira, , S. Chand & Co, 5th Edition,-2008.

REFERENCES:

1. Operations Research , S.D.Sharma-Kedarnath - Ramnath Delhi 16th Revised Edition, 2010.
2. Introduction to Operations Research, Hiller & Libermann , CBS Publishes, 1st Edition, 1994.

CORE PRACTICAL

Practical 3- JAVA Programming LAB

List of Practical's

1. Implementing Package, inheritances and interfaces
2. Implementing Flow, Border and Grid Layouts
3. Implementing Dialogs , Menu and Frame
4. Implementing User defined Exception Handling
5. Implementing Multithreading
6. Implementing I/O Stream File handling
7. Implementing a Calculator using Swing
8. CRUD operation Using JDBC
9. Client Server using TCP and UDP Socket
- 10. GUI application with JDBC**

ALLIED - 2

FINANCIAL ACCOUNTING - I

Objective:

To gain knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Introduction

Meaning of accounting – objectives of accounting – advantages and limitations of accounting- Accounting concepts and conventions - Methods of accounting -Rules of debit and credit- Journal - Ledger accounts– Trial Balance - Errors and their rectification - Rectification of Errors without suspense a/c - Rectification errors with suspense a/c (effect of rectification on profit and rectification during subsequent accounting year are excluded) - Bank Reconciliation Statement.

Unit - II: Depreciation, Provisions and Reserve

Meaning of depreciation – causes for depreciation – need for charging depreciation – Methods of calculating depreciation: straight line method and written down value method (change in method of depreciation is excluded) – Methods of recording depreciation: by charging depreciation to assets account or by creating provision for depreciation account.

Unit - III: Bills of exchange

Meaning of bill of exchange - features and advantages of bill of exchange- types of bill of exchange: Trade bills and accommodation bills - Accounting treatment of trade bills (accommodation bills are excluded).

Unit - IV: Final accounts

Meaning of final accounts – adjustments in preparation of final accounts – preparation of trading, profit & loss account and balance sheet of sole proprietorship concern.

Unit V: Accounts from incomplete records

Meaning of single entry system – features and limitations of single entry system – Distinction between single entry system and double entry system - Methods of calculation of profit: Statement of affairs method and Conversion method – Distinction between statement of affairs and balance sheet.

Note: Questions in section A,B and C shall be in the proportion of 20: 80 between theory and problems

Text books

1. Jain & Narang, Financial Accounting, Kalyani Publishers, New Delhi.
2. T.S. Reddy & Dr. A. Murthy, Financial Accounting, Margham Publications, Chennai.

Reference books

1. Gupta, R.L. & Gupta, V.K., Advanced Accounting, Sulthan Chand & Sons, New Delhi.
2. Shukla & Grewal, Advanced Accounting, S. Chand & Co. New Delhi.
3. Parthasarathy, S. & Jaffarulla, A. Financial Accounting, Kalyani Publishers, New Delhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SKILL BASED SUBJECT – PAPER 1

DESIGN AND ANALYSIS OF ALGORITHMS

Objective: To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT -I: ALGORITHM AND ANALYSIS

What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms.

UNIT - II: DIVIDE AND CONQUER

General Method - Binary Search - Finding the Maximum and Minimum-Merge Sort - Quick Sort - Selection Sort- Strassen's Matrix Multiplications.

UNIT - III: THE GREEDY METHOD

The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines- Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.

UNIT - IV: DYNAMIC PROGRAMMING

The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem

UNIT - V: TRAVERSAL, SEARCHING & BACKTRACKING

Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-Queens Problem – Sum of Subsets- Graph Coloring- Hamiltonian Cycles

TEXT BOOK

Fundamentals of Computer Algorithms, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Galgotia Publications, 1998.

REFERENCE BOOKS:

1. Introduction to Algorithms, Cormen T.H., Leiserson C.E. and Rivest R.L., PHI 1998.
2. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education, 2nd Edition.

NON MAJOR ELECTIVE – I

INTRODUCTION TO INFORMATION TECHNOLOGY

Objective:

To enable the student to be proficient with Information Technology with a better knowledge of Computer

UNIT – I

Introduction to Computers: Definition - Characteristics of a Computer - Classification of Computers - Basic Anatomy of the Computer - Applications / Uses of Computers in different fields

UNIT – II

Input and Output Devices: Input Devices - Output Devices - Data Representation - Programming Languages / Computer Languages - **Software:** System Software - Application Software

UNIT – III

Data Communication and Computer Networks: Data Communication - Computer Network - The Uses of a Network - Types of Networks - Network Topologies- Transmission Media: Guided Transmission Media - Wireless Transmission

UNIT – IV

Internet and its Applications : History of Internet - Uses of Internet - Advantages of Internet - ISP - Internet Services - IP Address - Web Browser - URL - DNS - Internet Explorer - Types of internet connections - E-mail - Search Engine.

UNIT – V

Operating System: Evolution of operating systems - Function of Operating System - Classification of Operating –System - Example of Operating System – DOS –Windows – UNIX - Linux

TEXT BOOKS:

1. Alexis Leon and Mathews Leon, “Fundamentals of Information Technology”, Vikas Publishing House Pvt. Ltd.
2. Introduction to Information Technology, P.Rizwan Ahmed, Second Edition, Margham Publications, 2016
3. Introduction to Information Technology, PelinAksoy, Laura DeNardis, Cengage Learning India Private Limited.

SEMESTER IV
CORE THEORY PAPER – 6
DATABASE MANAGEMENT SYSTEM

Objective: To incorporate a strong knowledge on databases to students

UNIT - I Database Basics

Introduction: Flat File – Database System – Database – Actionable for DBA. The Entity – Relationship Model: Introduction – The Entity Relationship Model. Data Models: Introduction – Relational Approach – The Hierarchical Approach – The Network Approach.

UNIT – II Relational Algebra

Structure of Relational Databases – Fundamental Relational Algebra Operations –Additional Relational Algebra Operations - Extended Relational Algebra Operations - Null Values - Modification of the Database - The Tuple Relational Calculus – The Domain Relational Calculus

UNIT – III Normalization

Normalization: Introduction - Normalization – Definition of Functional Dependence (FD) – Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT – IV Structured Query Language

Structured Query Language: Features of SQL – Select SQL Operations – Grouping the Output of the Query – Querying from Multiple Tables – Retrieval Using Set operators – Nested Queries. T-SQL – Triggers and Dynamic Execution: Transact-SQL..

UNIT – V Procedural Language

Procedural Language- SQL: PL/SQL Block Structure – PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor – Processing Explicit Cursor – Implicit Cursor – Exception Handlers – Sub Programs in PL/SQL – Functions – Precaution While Using PL/SQL Functions – Stored Procedure – Object Oriented Technology.

Text Book

1. Rajesh Narang, “Database Management Systems”, PHI Learning Private Limited, New Delhi, sixth printing, 2010.

Reference

1. S.K. Singh, “Database Systems – Concepts, Design and Applications”, Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008
2. Database System Concepts , Abraham Silberchatz, Henry F Korth , S.Sudarshan, McGraw-Hill - 5th Edition - 2006.

CORE THEORY PAPER – 7

ENTERPRISE RESOURCE PLANNING

UNIT - I

Business function and Business process: Functional areas and Business Process - functional area of operations - Business process - Marketing Sales - supply chain management - Accounting and finance - Human Resource - Functional areas of information system - The development of ERP system SAP R/3 - New directions in ERP - significance and benefits of ERP software and systems.

UNIT - II

Marketing information system and sales order process in ERP: sales and Distribution in ERP - Pre sales activities - sales order processing - inventory Sourcing - Delivery - Billing - payment - Customer relationship Management - benefits of CRM.

UNIT - III

Production and supply chain management information system: Production overview - The production planning process - The SAP ERP Approach to production planning - Sales forecasting - sales and operation Planning - Demand management - Material requirement planning in SAP ERP - ERP and supplier - Supply chain

UNIT - IV

Accounting in ERP: Accounting activities - using ERP for accounting Information - operational decision making problem - credit management - Industrial credit management in SAP ERP - product profitability analysis - Management reporting with ERP system - Document flow for customer Service.

UNIT - V

Human resource process in ERP: HR with ERP - Advance HR features - Time management - Payroll - Travel management - Training and Development - Management by objectives - ERP process modeling.

Text Book:

1) ELLEN MONK and BRET WAGNER, ENTERPRISE RESOURCE PLANNING - 3rd edition - MGH.

CORE THEORY PAPER – 8

DECISION SUPPORT SYSTEM

UNIT I

DECISION-MAKING AND COMPUTERIZED SUPPORT-Management Support Systems: An Overview, Decision Making, Systems, Modeling, and Support.

UNIT II

DECISION SUPPORT SYSTEMS-An Overview, Data Management: Warehousing, Access, and Visualization , Modeling and Analysis , Knowledge based Decision Support and Artificial Intelligence , User Interface and Decision Visualization Applications , Constructing a Decision Support System and DSS Research.

UNIT III

COLLABORATION, COMMUNICATION, AND ENTERPRISE SUPPORT SYSTEMS-Networked Decision Support: The Internet, Intranets, and Collaborative Technologies, Group Decision Support Systems, Executive Information and Support Systems.

UNIT IV

FUNDAMENTALS OF EXPERT SYSTEMS AND INTELLIGEN SYSTEMS-Fundamentals of Expert Systems, Knowledge Acquisition and Validation, Knowledge Representation, Inferences, Explanations, and Uncertainty, Building Expert Systems: Process and Tools.

UNIT V

CUTTING-EDGE DECISION SUPPORT TECHNOLOGIES-Neural Computing: The Basics, Neural Computing Applications, Genetic Algorithms, Fuzzy Logic, and Hybrid Intelligent Systems , Intelligent Agents and Creativity , Implementing and Integrating Management Support Systems , Organizational and Societal Impacts of Management Support Systems.

Text Book :

1. Efraim Turban, Jay E. Aronson, "Decision Support Systems and Intelligent Systems", Prentice Hall, New Delhi, 2004

Reference book:

1. George Marakas, "Decision Support Systems in the 21st Century", Prentice Hall, New Delhi, 2003
2. Robert J Thierauf, "User Oriented Decision Support Systems", Prentice Hall, New Delhi

PRACTICAL – IV

RDBMS Lab

1. Table creation and simple Queries
2. Queries using Aggregate Function and Set Operations
3. Table creation with various Joins
4. Nested Sub queries and correlated Sub queries
5. View creation and manipulation
6. PL/SQL program for cursor
7. PL/SQL program for packages
8. PL/SQL program for triggers and its type
9. PL/SQL program for procedures and functions

ALLIED – II

FINANCIAL ACCOUNTING - II

Objective:

To gain a knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Branch accounts

Meaning – objects of branch accounts – accounting in respect of dependent branches: debtors system; stock and debtors system; wholesale branch system and final accounts system - Independent branches – incorporation of branch trial balance in head office books.

Unit - II: Departmental Accounting

Meaning of departments and departmental accounting – Distinction between departments and branches- need for departmental accounting – advantages of departmental accounting - Apportionment of indirect expenses – Inter departmental transfers at cost and selling price - preparation of departmental trading, profit & loss account and balance sheet.

Unit - III: Hire purchase and Instalment purchase systems

Meaning and features of hire purchase system - calculation of interest – books of hire purchaser and books of hire vendor - default and repossession (Hire purchase trading account excluded)

Meaning of instalment system -distinction between hire purchase system and instalment system - calculation of interest – books of buyer and books of seller.

Unit - IV: Partnership accounts (fundamentals and reconstitution of partnership)

Meaning and features of partnership – Partnership deed - calculation of Interest on capital and interest on drawings – preparation of profit & loss appropriation account – preparation of capital accounts (fixed and fluctuating) – admission of a partner – retirement of a partner – death of a partner – treatment of goodwill as per AS 10.

Unit - V: Partnership Accounts (Dissolution of partnership firms)

Dissolution of a firm – insolvency of a partner (Garner Vs Murray rule) – Insolvency of all the partners – Piecemeal distribution: proportionate capital method and maximum loss method.

Note: Questions in section A, B and C shall be in the proportion of 20: 80 between theory and problems.

Text books

1. Jain & Narang, Financial accounting, Kalyani publishers, New Delhi
2. T.S. Reddy & Dr. A. Murthy, Financial accounting, Margham publications, Chennai

Reference books

1. Gupta, R.L. & Gupta, V.K., Advanced Accounting, Sultan Chand & Sons, New Delhi.
2. Shukla & Grewal, Advanced Accounting, S. Chand & Co. New Delhi.
3. Parthasarathy, S. & Jaffarulla, A. Financial Accounting, Kalyani Publishers, New Delhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SKILLED BASED SUBJECT - II

COMPUTER ORGANISATION AND ARCHITECTURE

Objective: To enable the student to have a better understanding of architecture of computer and prepare the student for higher level of programming

UNIT - I

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions – Input-Output and Interrupts.

UNIT - II

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT - III

Introduction – General Register Organization – Instruction Formats – Addressing Modes.

UNIT – IV

Peripheral Devices – I/O interface – Asynchronous Data Transfer – Modes of Transfer - Direct Memory Access – Input Output Processor (Excluding IBM and Intel IOPs).

UNIT - V

Auxiliary Memory – Main Memory – Auxiliary Memory - Associative Memory – Cache Memory -Virtual Memory.

TEXT BOOK

1. Morris Mano M. Computer System Architecture. New Delhi :Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings . Computer Organization and Architecture. 8th edition. Pearson publication, 2010
2. Morris Mano. Digital Logic and Computer Design. New Delhi :Prentice Hall of India Private Limited, 2001

NON MAJOR ELECTIVE II

INTERNET AND ITS APPLICATION

Objective: To equip students to basics of Internet usage and prepare them for digital

UNIT- I

Introduction to Computers Programming Language types History of Internet Personal Computers History of World Wide Web- Micro software .NET Java-Web resources.

UNIT – II

Web Browsers- Internet Explorer- connecting to Internet Features of Internet explorer6 Searching the Internet- online help and tutorials- File Transmission Protocol (FTP) Browser settings.

UNIT – III

Attaching a file, Electronic mail Creating an E-mail id Sending and Receiving mails-attaching a file-Instance messaging- other web browsers.

UNIT - IV

Introduction to HTML headers - Linking- Images-special characters and line breaks- unordered lists- simple HTML programs.

UNIT - V

E-marketing consumer tracking Electronic advertising search engine-CRM- credit card Payments- Digital cash – e wallets – smart card.

Textbook

Internet and World Wide Web Third edition H.M.Deital, P.J. Deital and A.B.Goldberg-PHI

Book for Reference

1. The Internet- Complete Reference Harley hahn, Tata McGraw hill
2. Internet and its Applications, P.Rizwan Ahmed, Margham Publication, 2014

SEMESTER V

CORE THEORY PAPER – 9

MOBILE APPLICATIONS DEVELOPMENT

Objectives:

This course aims to provide the students with a detailed knowledge on Mobile Application and Development and covers Android programming from fundamentals to building mobile applications for smart gadgets.

UNIT I Introduction to Mobile Applications:

Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android — Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT II Android development:

Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT III Android Services:

Simple services – Binding and Querying the service – Executing services.- Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT IV Android User Interface:

Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert dialogs-Spinners-rating bar-progress bar.

UNIT V Publishing and Internationalizing mobile applications :

Live mobile application development: Game, Clock, Calendar, Convertor, Phone book. App Deployment and Testing: Doodlz app – Tip calculator app – Weather viewer app.

Text Books

1. Barry Burd, “Android Application Development – All-in-one for Dummies”, 2nd Edition, Wiley India, 2016.

Reference

1. Paul Deitel, Harvey Deitel, Alexander Wald, “ Android 6 for Programmers – An App-driven Approach”, 3rd edition, Pearson education, 2016.
2. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGraw Hill Education, 8th reprint, 2015.
3. <http://www.developer.android.com>

CORE THEORY PAPER - 10

OPERATING SYSTEM

Objective: Enable the student to get sufficient knowledge on various system resources.

Unit – I Operating System Basics

Basic Concepts of Operating System - Services of Operating System-Classification of Operating System- Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

Unit –II Operating System Scheduling

CPU Scheduling: Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling;-Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock- Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

Unit- III Memory management

Memory Management - Basic Concept of Memory - Address Binding; Logical and Physical Address Space- Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

Unit – IV Swapping

Swapping- Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory- Demand Paging - Transaction Look aside Buffer (TLB) - Inverted Page Table-Page Replacement Algorithms

Unit –V File Management

File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

Text Books:

Abraham Silberschatz Peter B. Galvin, G. Gagne, “Operating System Concepts”, Sixth Edition, Addison Wesley Publishing Co., 2003.

Reference

1. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson
2. Willam-Stalling “Operating System” Fourth Edition, Pearson Education, 2003.

CORE THEORY PAPER - 11

DATA COMMUNICATION & NETWORKS

Objective:

To equip students to basics of Data Communication and prepare them for better computer networking

UNIT I

Introductory Concepts - Network hardware - Network software – Network Architecture - Physical layer - Guided transmission media - Cable television.

UNIT II

Data Link Layer - Design issues - Channel allocation problem - Multiple access protocols - Ethernet - Wireless LAN - 802.11 architecture.

UNIT III

Network Layer : Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.

UNIT IV

Transport Layer - Transport service - Elements of transport protocols - User Datagram Protocol - Transmission Control Protocol.

UNIT V

Application Layer - DNS - Electronic mail - World Wide Web - Multimedia - Network security.

TEXT BOOK

1. Tannenbaum, A.S., 2003 : Computer Networks, Prentice Hall.

REFERENCES

1. Stallings, William, 2008 : Local and Metropolis Area Networks : An Introduction, Macmillan Publishing Co.
2. Black : Data Network, Prentice Hall of India.
3. W. Stallings, "Data and Computer Communication", Pearson Education, Fifth Edition, 2001

CORE PRACTICAL – 5

MOBILE APPLICATIONS DEVELOPMENT – LAB

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation
11. Grid View
12. Internal Storage - Files
13. SQLite - Database
14. Google Map
15. Permissions

CORE PRACTICAL – 6
OPERATING SYSTEM LAB

1. Implementing the Process system calls.
2. Implementing I/O system calls.
3. Implementing IPC using message queues.
4. Implementing CPU & scheduling algorithm for first come first serve scheduling.
5. Implementing CPU scheduling algorithm for shortest job first scheduling.
6. Implementing perform priority scheduling.
7. Implementing CPU scheduling for Round Robin Scheduling.
8. Implementing pipe processing.
9. Implementing first fit, best fit algorithm for memory management.
10. A program to simulate producer-consumer problem using semaphores.
11. A Shell Program to find factorial of a given number
12. A shell program to generate Fibonacci number

Elective – 1

A. DATA MINING

Objective: Enable the student to get sufficient knowledge on mining the data .

UNIT - I: Data Mining Basics

Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT - II: Data Models

Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Meta Data.

UNIT - III: Data Editing

Data Pre-Processing And Characterization :Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT - IV: Classification

Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT - V: Analysis

Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

TEXT BOOKS:

1. PaulrajPonnaiah, “Data Warehousing Fundamentals”, Wiley Publishers, 2001.
2. Jiawei Han, MichelineKamber, “Data Mining: Concepts and Techniques”,Morgan Kaufman Publishers, 2006.

REFERENCES:

1. UsamaM.Fayyad, Gregory Piatetsky Shapiro, Padhraí Smyth RamasamyUthurusamy, “Advances in Knowledge Discover and Data Mining”, the M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002
3. Alex Berson, Stephen Smith, Kurt Thearling, “Building Data Mining Applications for CRM”, Tata McGraw Hill, 2000.
4. Margaret Dunham, “Data Mining: Introductory and Advanced Topics”, Prentice Hall, 2002.
5. Daniel T. Larose John Wiley & Sons, Hoboken, “Discovering Knowledge in Data: An Introduction to Data Mining”, New Jersey, 2004

B. COMPUTER GRAPHICS

Objectives: To equip students to basics of computer drawing and prepare them for computer modeling of objects

UNIT – I : OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES

Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Deices- Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms

UNIT – II : ATTRIBUTES AND TWO DIMESIONAL TRANSFORMATIONS

Line Attributes- Curve Attributes-Color And Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation

UNIT – III : TWO DIMENSIONAL VIEWING AND CLIPPING

The Viewing Pipeline- Window To Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky-Sutherland Hodgeman Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification Of Input Devices- Interactive Picture Construction

UNIT – IV : THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING

Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -

UNIT – V : VISIBLE SURFACE DETECTION METHODS

Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method - Area Sub Division Method - Octree Methods - Ray Casting Method

TEXT BOOK:

Computer Graphics(C version), Donald Hearn and M.Pauline Baker, Pearson- 2nd Edit. 2012.

REFERENCE BOOKS:

1. Interactive Computer Graphics–A top down approach using Open GL, Edward Angel , Pearson, 5th Edition.
2. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning, Indian Edition,2009.

C. INFORMATION SECURITY

Objective: To enable the student to understand various methodology available for securing information

UNIT I Information Security Basics

INTRODUCTION -History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II Security Investigation

SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III Security Analysis

SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV Security Models

LOGICAL DESIGN-Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V Security Physical Design

PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

Text Book

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

Reference

1. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.

SKILL BASED SUBJECT - 3

SOFTWARE ENGINEERING

Objective:

This course introduces the concepts and methods required for the construction of large software intensive systems.

UNIT-I:

Introduction - Evolving Role of Software - Changing Nature of Software – Software Myths; A Generic View of Process: Layered Technology - Process Models: Waterfall Model - Evolutionary Process Models.

UNIT-II:

Requirements Engineering: Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modeling Concepts.

UNIT-III:

Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model Creating an Architectural Design: Software Architecture - Data Design - Architectural Design - Mapping Data Flow into Software Architecture; Performing User Interface Design: Golden Rules.

UNIT-IV:

Testing Strategies: Strategic Approach to Software Testing- Test Strategies for Conventional and Object Oriented Software - Validation Testing - System Testing - Art of Debugging. Testing Tactics: Fundamentals - White Box- Basis Path - Control Structure - Black Box Testing Methods

UNIT-V:

Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation - Project Scheduling - Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

TEXT BOOK:

Roger S Pressman, “Software Engineering - A Practitioner’s Approach”, Sixth Edition, McGraw Hill International Edition, New York: 2005.

REFERENCES:

1. Ian Sommerville, “Software Engineering”, 7th Edition, Pearson Education, 2006.
2. Mall Rajib, “ Software Engineering”, 2/E, PHI, 2006.

SEMESTER VI
CORE THEORY PAPER – 12
CLOUD COMPUTING

Objective:

To enable the students to learn the basic functions, principles and concepts of cloud Systems.

UNIT I: UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT II: DEVELOPING CLOUD SERVICES

Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III: CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events.

UNIT IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT V: SECURITY IN THE CLOUD

Security Overview - Cloud Security Challenges and Risks - Software-as-a-Service Security- Security Governance - Risk Management - Security Monitoring - Security Architecture Design - Data Security - Application Security - Virtual Machine Security - Identity Management and Access Control - Autonomic Security.

TEXT BOOK:

1. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.
4. Kumar Saurabh, “Cloud Computing – insights into New-Era Infrastructure”, Wiley India, 2011.
5. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud” O'Reilly

CORE THEORY PAPER – 13

OPEN SOURCE PROGRAMMING

Objectives:

To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, CSS and Linux

UNIT I : INTRODUCTION TO HTML5, JAVA SCRIPT, PHP AND CSS

Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas - The HTML5 Canvas- HTML5 Audio and Video- Introduction to CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors.

UNIT-II : LINUX

Introduction : Linux Essential Commands – File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNI- III : MYSQL

Introduction to MY SQL – The show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative detail – Table Joins – Loading and Dumping a Database.

UNIT-IV : PHP

PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control -statement – Array – Functions.

UNIT – V PHP

Basic Form Processing – File and Folder Access – Cookies – Sessions – Database Access with PHP – MySQL - MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

Text Books

1. “Learning PHP, MySQL, Java Script, CSS and HTML5”, Robin Nixon, O’Reilly Publications, 3rd Edition, 2014.
2. Steven Holzner, “HTML Black Book”, Dreamtech Press &Paraglyph Press Publishers, 2007
- 3.

Reference Books

Open Source Software, P.Rizwan Ahmed, Margham Publication, Chennai, 2015

Core Practical
PRACTICAL – VII
ASP.NET Lab

1. Implement Validation Controls
2. Write a Program to implement ad rotator control
3. Write a Program to implement state management techniques
4. Write a Program to implement view State and Session State.
5. Write a Program to displaying data with the grid view
6. Write a Program to implement ASP.Net Server Side Controls.
7. Write a Program to implement ASP.Net Master Pages, Themes and Skins.
8. Write a Program working with forms using ASP.Net
9. Write a Program working with pages using ASP.Net.
10. Write a Program to access data sources through ADO.NET

Core Practical
PRACTICAL – VIII
Open Source Programming Lab

1. Create a web page with Frames and Tables.
2. Create a web page incorporating CSS (Cascading Style Sheets)
3. Write a shell program to find the factorial of an integer positive number
4. Write a shell program for checking whether a given string is a palindrome or not.
5. Create a simple calculator in Java script.
6. Write a JavaScript program to scroll your name in the scroll bar.
7. Develop a program and check message passing mechanism between pages.
8. Develop a program and check file system functions, date & time functions.
9. Create a student database table in MYSQL and manipulate records (insert, delete, update) records in a web browser.
10. Develop a program using cookies and session.

Elective II PAPER – 2

(A) SOFTWARE TESTING

Objective: To make the student more proficient with error free software development

UNIT-I PRINCIPLES OF TESTING

A test in time - The cat and the saint - Test the tests first - The Policemen on the bridge - Phase of software project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation - Process model to represent different phases - Life cycle models.

UNIT-II BLACK BOX AND WHITE BOX TESTING

White box testing - Challenges - Static testing - Structural testing - Black box testing.

UNIT-III INTEGRATION, SYSTEM AND ACCEPTANCE TESTING

Integration testing - Types - Phase of testing - Scenario testing - Defect bash - System and Acceptance testing: Overview - Functional vs. Non-Functional testing - Functional system testing - Non-functional testing-Acceptance testing.

UNIT-IV PERFORMANCE AND REGRESSION TESTING

Introduction - Factors Governing - Methodology for Performance testing - Tools and Process for Performance Testing - Regression Testing - Types of Regression testing - How to do Regression Testing?

UNIT-V INTERNATIONALIZATION AND ADHOC TESTING

Introduction to Internationalization - Primer on Internationalization - Test phases for Internationalization testing - Enabling testing - Locale testing - Internationalization Validation- Fake language testing - Language testing - Localization testing - Tools used for Internationalization - Challenges and Issues - Overview of Ad Hoc testing - Buddy, Pair, Exploratory, Iterative, Agile and Extreme Testing - Defect Seeding.

TEXT BOOK:

1. Srinivasan Desikan, Gopalaswamy Ramesh, “Software Testing: Principles and Practices”, Pearson Publications, 2006.

REFERENCES:

1. RenuRajani, Pradeep Oak, “Software Testing- Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
2. Boris Beizer, “Software Testing Techniques”, Dream Tech Press, Second Edition, 2003.

Elective II PAPER – 2

(B) MOBILE COMPUTING

Objective: To impart good knowledge of wireless communication to students

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA –TDMA – CDMA – Cellular Wireless Networks.

UNIT II TELECOMMUNICATION NETWORKS & WIRELESS LAN

Telecommunication systems – GSM – GPRS - Satellite Networks ,Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a -802.11b standards – HIPERLAN – Blue Tooth.

UNIT III MOBILE NETWORK LAYER & TRANSPORT LAYER

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics. Traditional TCP, Mobile TCP

UNIT IV APPLICATION LAYER

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts

UNIT V DATABASE ISSUES

Database Issues : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCE BOOKS:

1. KavehPahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, 2003..

Elective II PAPER – 2

C. MICROPROCESSORS AND ITS APPLICATIONS

Objective:

To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.

Unit-I : 8085 MICROPROCESSOR AND ARCHITECTURE

Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts

Unit II : PROGRAMMING THE 8085

Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions

Unit-III : 8086 MICROPROCESSOR AND ARCHITECTURE

Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes.

Unit-IV : PROGRAMMING THE 8086

8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives

Unit-V : INTERFACING PERIPHERALS

8255 PPI , 8253/8254 PIT, 8237 DMAC, 8259 PIC, 8251 USART.

TEXT BOOK

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S. Gaonkar, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I, II and V)
2. Microprocessors and Interfacing, Douglas V. Hall, Tata McGraw Hill , 2nd Ed. (for Units III and IV)

REFERENCE BOOKS:

1. Assembly Language Programming the IBM PC , Alan R. Miller, Subex Inc, 1987.
2. Advanced Microprocessors and Peripherals, Ray A K , Bhurchandi K M , TMH.

Elective III PAPER – 3

(A) Internet of Things

Objective: To prepare the student for better application of internet technology.

Unit – I IoT Introduction

Introduction to Internet of Things: Definition – Characteristics of IOT – Physical Design of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – Iot Functional Blocks – IoT Communication Models – IoT Communication APIs – IoT Enabling Technologies

Unit – II Domain Specific IoT - 1

Domain Specific IoT – I : Smart Lighting – Smart Appliances – Intrusion Detection – Smoke / Gas Detection – Smart Parking – Smart Roads – Structural Health Monitoring – Surveillance – Emergency Response – Weather Monitoring –

Unit – III Domain Specific IoT II

Domain Specific IoT – II : Air Pollution Monitoring – Noise Pollution Monitoring – Forest Fire Detection – River Flood Detection – Smart Grids- Smart Vending Machines – Route Generation & Scheduling – Fleet Tracking – Shipment Monitoring –

Unit – IV Domain Specific IoT III

Domain Specific IoT – III: Remote Vehicle Diagnostics – Smart Irrigation - Green House Control – Machine Diagnosis & Prognosis – Indoor Air Quality Monitoring – Health & Fitness Monitoring – Wearable Electronics

Unit – V IoT and M2M

IoT And M2M: M2M – Difference Between Iot And M2M – SDN And NFV For IoT – IoT System Management With NETCONF – YANG : Need For Iot Systems Management – SNMP- Network Operator Requirements – NETCONF – YANG-IoT Systems Management With NETCONF - YANG

Text Books:

1. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann.

Reference

1. Internet of Things, P.Rizwan Ahmed, Margham Publications, Chennai.
2. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally

(B) System Software

Objective: To make the student to become more proficient with system programming

Unit – I LANGUAGE PROCESSORS

Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

UNIT II ASSEMBLERS AND MACRO

Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

UNIT III COMPILER I

Scanning: Finite State Automate – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

UNIT IV COMPILER II AND INTERPRETERS

Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

UNIT V LINKERS

Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

TEXT BOOK

D.M. Dhamdhere, “System Programming And Operating Systems”, New Delhi: Tata McGraw-Hill Publishing Company Limited, 1993.

Elective III PAPER – 3
(C) Multimedia Systems

Objective :

This course presents the Introduction to Multimedia, Images & Animation and enable the students to learn the concepts of Multimedia.

UNIT I Introduction to Multimedia:

Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools
Sound and Graphics : Digital Sound – Editing and Mixing sound files – MIDI creation –
Tracking Procedure – Interactive and Non Interactive Graphics – High Resolution Graphics –
Difference between TV and Computer Display.

UNIT II Video and Animation :

Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing
and Warping – Two Dimensional and Three dimensional animation – Animation Tools –
Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking
System – Motion Capturing System.

UNIT III Creating Presentation:

Script Writing and creating interactive and non-interactive presentation – Linear and
Non Linear Editing – Authoring Tools – File Formates SOUND, VIDEO, ANIMATION,
Presentation Images. Multimedia Programming: Text Links – Hyper Text system – Form
Creation – File storing - Error Trapping.

UNIT IV Sound Links:

Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE , MIDI
file processing. Animation : Color Palette – Events – ROPs.

UNIT V Imaging Special Visual Effects :

Bitmap – Brushes – Dissolve –Hotspot Editor – Scrolling. Media Control Interface :
Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

Text Books :

1. Kaliyaperumal Karthikeyan, “Introduction to Multimedia System”, LAP Lambert Academic Publishing, 2011
2. TayVaughan, “Multimedia Making It Work Eighth Edition”, Tata McGraw-Hill Publishing Company, 2011
3. ParagHavaldarand Gerald Medioni, “Multimedia Systems”, Cengage Learning, 2011
4. S. K. Bansal, “Multimedia Systems”, Aph Publishing Corporation, 2011

Skilled Based Subject IV – Paper 4

ASP .NET

Objective: Students to become well aware of .NET technology

UNIT I : ASP.NET Basics

Introduction to ASP.NET: .NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle. Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

UNIT II : Form

Form validation: Client side validation, Server side validation, Validation Controls: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control. State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State.

UNIT III : ADO.NET

Architecture of ADO. NET, Connected and Disconnected Database, Create Database, Create connection Using ADO.NET Object model, Connection Class, Command Class, Data Adapter Class, Dataset Class, Display data on data bound controls and Data Grid.

UNIT IV : Database accessing

Database accessing on Web Applications: Data Binding Concept with web, Creating Data Grid, Binding standard web server controls, Display data on web form using Data Bound Controls.

UNIT V : XML

Writing Datasets to XML, Reading datasets with XML. WEB services: Remote method call using XML, SOAP, Web service description language, Building and Consuming a web service, Web Application deployment.

Textbook:

Professional ASP.NET 1.1 Bill Evjen , Devin Rader , Farhan Muhammad, Scott Hanselman , SrivakumarWrox

REFERENCE BOOKS:

1. Introducing Microsoft ASP .NET 2.0 Esposito PHI
2. Professional ADO.NET BipinJoshi, Donny Mack, Doug Seven , Fabio Claudio Ferracchiati, Jan D Narkiewiez Wrox
3. Special Edition Using ASP.NET Richard Leineker Person Education
4. The Complete Reference ASP.NET Matthew MacDonald TMH
5. ASP.NET Black Book DreamTech

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SCIENCE

B.Sc. BOTANY

DEGREE COURSE

CBCS PATTERN

(With effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

| S.NO | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|------------------|-------------|----------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| SEMESTER I | | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 6 | Phycology and Mycology | 25 | 75 | 100 |
| 4 | III | Core Practical | Practical-1 | 3 | 0 | | 0 | 0 | 0 |
| 5 | III | ALLIED - 1 | Paper-1 | 4 | 4 | Zoology I | 25 | 75 | 100 |
| 6 | III | Allied Practical | Practical-1 | 3 | 0 | | 0 | 0 | 0 |
| 7 | IV | Environ. Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 125 | 375 | 500 |
| SEMESTER II | | | | | | | CIA | Uni. Exam | Total |
| 8 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 9 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-2 | 6 | 5 | Bacteriology, Virology, Lichenology, Bryophytes and Plant Diseases | 25 | 75 | 100 |
| 11 | III | Core Practical | Practical-1 | 3 | 3 | Covering Papers I and II | 25 | 75 | 100 |
| 12 | III | ALLIED-1 | Paper-2 | 4 | 4 | Zoology II | 25 | 75 | 100 |
| 13 | III | Allied Practical | Practical-1 | 3 | 2 | Zoology | 25 | 75 | 100 |

B.Sc. Botany: Syllabus (CBCS)

| | | | | | | | | | |
|---------------------|-----|---------------------|-------------|-----------|-----------|--|------------|------------------|--------------|
| 14 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 15 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 16 | I | Language | Paper-3 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 17 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 18 | III | Core Theory | Paper-3 | 3 | 3 | Pteridophytes, Gymnosperms and Paleobotany | 25 | 75 | 100 |
| 19 | III | Core Practical | Practical-2 | 3 | 0 | | 0 | 0 | 0 |
| 20 | III | ALLIED-2 | Paper-3 | 4 | 4 | Chemistry I | 25 | 75 | 100 |
| 21 | III | Allied Practical | Practical-2 | 3 | 0 | | 0 | 0 | 0 |
| 22 | IV | Skill based Subject | Paper-1 | 3 | 3 | Horticulture | 25 | 75 | 100 |
| 23 | IV | Non-major elective | Paper-1 | 2 | 2 | Medicinal Botany | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 24 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 25 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 26 | III | Core Theory | Paper-4 | 3 | 3 | Cytology and Plant Anatomy | 25 | 75 | 100 |
| 27 | III | Core Practical | Practical-2 | 3 | 3 | Covering Papers III and IV | 25 | 75 | 100 |
| 28 | III | ALLIED-2 | Paper-4 | 4 | 4 | Chemistry II | 25 | 75 | 100 |
| 29 | III | Allied Practical-2 | Practical-2 | 3 | 2 | | 25 | 75 | 100 |
| 30 | IV | Skill based Subject | Paper-2 | 3 | 3 | Mushroom Cultivation | 25 | 75 | 100 |

| | | | | | | | | | |
|--------------------|-----|---------------------|-------------|-----------|-----------|---|------------|------------------|--------------|
| 31 | IV | Non-major elective | Paper-2 | 2 | 2 | Horticulture | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 32 | III | Core Theory | Paper-5 | 6 | 5 | Morphology and Embryology of Angiosperms | 25 | 75 | 100 |
| 33 | III | Core Theory | Paper-6 | 6 | 5 | Taxonomy of Angiosperms and Economic Botany | 25 | 75 | 100 |
| 34 | III | Core Theory | Paper-7 | 6 | 5 | Genetics, Plant Breeding, Evolution and Biostatistics | 25 | 75 | 100 |
| 35 | III | Core Practical | Practical-3 | 3 | 0 | | 0 | 0 | 0 |
| 36 | III | Core Practical | Practical-4 | 3 | 0 | | 0 | 0 | 0 |
| 37 | III | Elective | Paper-1 | 3 | 3 | A. Tissue Culture B. Plant Pathology C. Bio fertilizers | 25 | 75 | 100 |
| 38 | IV | Skill based Subject | Paper-3 | 3 | 3 | Herbal Science | 25 | 75 | 100 |
| | | | | 30 | 21 | | 125 | 375 | 500 |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 39 | III | Core Theory | Paper-8 | 5 | 5 | Plant Physiology and Plant Bio–Chemistry | 25 | 75 | 100 |
| 40 | III | Core Theory | Paper-9 | 5 | 4 | Ecology and Phyto geography | 25 | 75 | 100 |
| 41 | III | Core Theory | Paper-10 | 5 | 4 | Biodiversity, Bioinformatics and Toxicology | 25 | 75 | 100 |
| 42 | III | Core Practical | Practical-3 | 3 | 3 | Covering Papers 5, 6 & 7 | 25 | 75 | 100 |
| 43 | III | Core Practical | Practical-4 | 3 | 3 | Covering Papers 8, 9 & 10 | 25 | 75 | 100 |

B.Sc. Botany: Syllabus (CBCS)

| | | | | | | | | | |
|----|-----|----------------------|---------|-----------|-----------|--|------------|------------|------------|
| 44 | III | Elective | Paper-2 | 3 | 3 | A. Plant Biotechnology B. Seed Biology C. Ethno botany | 25 | 75 | 100 |
| 45 | III | Elective | Paper-3 | 3 | 3 | A. Microbiology B. Biostatistics & Computer Application in Botany C. Herbal Home Remedies & Water Management | 25 | 75 | 100 |
| 46 | IV | Skill based Subject | Paper-4 | 3 | 3 | Micro Technique | 25 | 75 | 100 |
| 47 | V | Extension Activities | | - | 1 | | 100 | 0 | 100 |
| | | | | 30 | 29 | | 300 | 600 | 900 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total marks |
|----------|-------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Sem) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Sem) | 2 | 4 | 8 | 100 | 200 |
| | Allied –Prac (Even Sem) | 2 | 2 | 4 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 10 | (3-7) | 45 | 100 | 1000 |
| | Core Practical | 4 | 3 | 12 | 100 | 400 |
| Part IV | Env. Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 41 | | 140 | | 4100 |

THIRUVALLUVAR UNIVERSITY
BACHELOR OF SCIENCE
B.Sc. BOTANY
SYLLABUS
CBCS PATTERN
(With effect from 2017 - 2018)
SEMESTER I
PAPER - 1
PHYCOLOGY AND MYCOLOGY

ALGAE

UNIT-I

History of algologist, General characters of algae, Classification of algae (F.E. Fritsch, 1945). Distribution of algae, Thallus organization of algae.

UNIT-II

Salient features of Chlorophyceae. Detail study of structure, reproduction and Life cycle of *Oedogonium*, *Chlorella* and *Chara*. salient features of Phaeophyceae. Detail study of structure, reproduction and life cycle of *Sargassum*. salient features of Bacillariophyceae. Detail study of structure, reproduction and life cycle of Diatoms.

UNIT-III

Salient features of Rhodophyceae. Detail study of structure, reproduction and life cycle of *Gracilaria*. Salient features of cyanophyceae. Detail study of structure, reproduction and life cycle of *Nostoc*. Economic importance of Algae.

UNIT-IV

General characters, mode of nutrition and occurrence of fungi. Classification for Fungi - (Alexopolous). Detail study of structure, reproduction and life cycle of Myxomycetes and Phycomycetes: Example - *Stemonites* and *Albugo*.

UNIT-V

Detail study of structure, reproduction and life cycle of Ascomycetes, Basidiomycetes and Deuteromycetes; Example - *Penicillium*, *Puccinia* and *Cercospora*. Economic importance of Fungi.

Books Suggested:

1. Fritsch, F.E. 1945. Structure reproduction of the Algae Vol. I & II, Cambridge University Press, London.
2. Vashishta, B.R. 1990 Botany for degree students, Algae. S. Chand & Co. Ltd., Ram Nagar, New Delhi.
3. Venkateshwaran, V.A. Text book of Algae. Marahi Book depot, Guntur.
4. Alexopoulos, C.J., C.W. Mims and M. Blackwell. 2007. Introductory Mycology. IV Edition. Wiley India (P) Ltd., Daryaganj, New Delhi..
5. Robert Edward Lee. 1980 Phycology, Cambridge University Press, London.
6. Vashista. B.R. 1981 Botany for Degree students Fungi. S. Chand & Co. Ltd., Ram Nagar, New Delhi.

**ALLIED
ZOOLOGY I**

Objective:

To acquire knowledge about different kinds of animal species.

To study the systematic and functional morphology of invertebrates and chordates.

UNIT – I:

Type study includes life history.

Protozoa - Entamoeba, **Porifera** - Sycon. **Coelenterata** - Obelia geniculata.
Platyhelminthes - Teania solium.

UNIT - II

Annelida - Earthworm, **Arthropoda** - Prawn, **Mollusca** - Fresh water mussel,
Echinodermata - Sea star.

UNIT – III:

Type study includes Morphology, digestive system, respiratory system, circulatory system and urinogenital system of Chordate.

Chordata - General characters, **Prochordata:** Morphology of Amphioxus.
Vertebrates: **Pisces** - Shark.

UNIT - IV

Amphibia: Frog, **Reptiles:** Calotes

UNIT - V

Aves: Pigeon, **Mammalia:** Rabbit.

REFERENCES:

1. Ayyar, E.K. and T.N. Ananthakrishnan. 1992. Manual of Zoology. Vol I & II, S. Viswanathan (printers and publishers) Pvt. Ltd., Madras, 891 p.
2. Kotpal series, 1998 - 1992. Rastogi Publications, Meerut.
3. Jordan E.L. and P.S. Verma. 1993. Invertebrate Zoology 12th edition, S. Chand & Co., Ltd., New Delhi.
4. Jordan, E.L., and P.S. Verma. 1995. Chordate Zoology and Elements of Animal Physiology, S. Chand & Co., Ltd., New Delhi.

SEMESTER II

PAPER - 2

**BACTERIOLOGY, VIROLOGY, LICHENOLOGY, BRYOPHYTES AND
PLANT DISEASES**

UNIT-I: BACTERIOLOGY

General Characters, Shape of bacteria, bacteria Flagellation, structure of bacteria, type of bacterial Nutrition, Respiration, Reproduction (asexual and sexual) in Bacteria, Economical Importance. Bacterial straining (Grams stain)

UNIT-II: VIROLOGY

General Characters, Classification of viruses, shape of viruses, Properties, Structure and Multiplication of TMV and T4 Bacteriophage.

UNIT-III: LICHENOLOGY

Nature, Occurrence, Classification Structure, Vegetative and Sexual Reproduction, Nutrition (With particular reference to fruticose lichen.) Economical importance, Role in Succession and Monitoring Pollutants.

UNIT-IV: BRYOPHYTES

General Characters, Classification of bryophytes (Reimers, 1954). Study the thallus Structure, reproduction and life cycle of the following types. (Excluding the developmental studies) *Marchantia* and *Polytrichum*. Economical importance of bryophytes.

UNIT-V: PLANT DISEASES

Detailed study of the following diseases and control measures.

1. Ground nut leaf spot disease. (*Cercospora*)
2. Tobacco Mosaic Disease.
3. Citrus Canker.

BOOKS SUGGESTED

1. Dube H.C. (1978), A text Book of Fungi, Bacteria and Viruses, Vikas publishing House, Pvt., Ltd., New Delhi & Bangalore.
2. Mishra. A and Agarwal R.P. (1978) Lichens A Preliminary text. Oxford and IBH. 66 Janapath, New Delhi 110 001.
3. Parihar, N.S. 1985. An introduction to Embryophyta – Bryophytes. Central Book Depot. Alahabad.
4. Sambamurthy A.V. S.S. 2006. A Textbook of Plant Pathology. I.K. International Pvt.Ltd., New Delhi
5. Vashishta. B.R., A.K. Sinha and Adarsh Kumar. 2005. Botany for Degree students- Bryophyta. S. Chand and Company Ltd., New Delhi.
6. Vashishta. B.R. (1978). Bryophyta. S.Chand & Co, Ram Nagar, New Delhi - 110 001,
7. Singh. R.S. 2005. Principles of Plant Pathology – 4th edition. Oxford & IBH

CORE PRACTICAL I
(COVERING PAPERS 1 AND 2)

I. PHYCOLOGY AND MYCOLOGY

1. A detailed study of structure of thallus and reproductive structure of forms given below *Nostoc*, *Oedogonium*, *Chlorella*, *Chara*, Diatoms, *Sargassum* and *Gracilaria*.
2. Observation and recognition of materials and organisms given in fungi. *Stemonites*, *Albugo*, *Penicillium*, *Puccinia* & *Cercospora*.
3. Economic importance of agar-agra, SCP, diatomaceous earth, edible mushroom, penicillin,

II. BACTERIOLOGY, VIROLOGY, LICHENOLOGY, BRYOPHYTES AND PLANT DISEASES

1. Structure of bacteria (*E. coli*), TMV and T4-Bacteriophage
2. General observation of thallus and reproductive structure of fruticose lichen (*Usnea*), *Marchantia* and *Polytrichum*.
3. Recognition of Pathological specimens and control measures of plant diseases given in Unit V.

**ALLIED
ZOOLOGY II**

Objective:

To study the principles of cell biology, genetics, developmental biology, physiology, ecology and evolution.

UNIT - I

Cell Biology - structure of animal cell, **Genetics:** molecular structure of gene - gene function, sex linked inheritance. Genetic Engineering and its application.

UNIT - II

Embryology - cleavage and gastrulation of Amphioxus.

Human Physiology: Digestion, Circulation - blood components, structure of heart, heart function.

UNIT - III

Diseases of Circulatory system - blood pressure, heart disease - Ischemia, Myocardial Infarction, Rheumatic heart disease, stroke.

Excretion - structure of kidney and mechanism of urine formation.

UNIT - IV

Environmental Biology - Biotic factors and Abiotic factors, food chain and food web. Pollution - Environmental degradation, (Air, Water and Land) - Green house effect - Bioremediation, Biodegradation - Global warming - acid rain.

UNIT - V

Evolution: Theories of Lamarkism & Darwinism.

REFERENCES:

1. Ekambaranatha Ayyar, and Ananthakrishnan, T.N. 1993. Outlines of Zoology, Vol I & II, Viswanathan and Co, Madras.
2. Sambasiviah, I, Kamalakara Rao, A.P., Augustine Chellappa, S. 1983. Text book of Animal Physiology, S. Chand & Co., New Delhi.
3. Verma and Agarwal. 1983. Text book of animal Ecology, S. Chand & Co., New Delhi.
4. Verma and Agarwal and Tyagi. 1991. Chordate Embryology, S. Chand & Co., New Delhi.
5. Rastogi and Jayaraj. 2000. Text book of Genetics. Rastogi publications, Meerut.
6. Verma and Agarwal. 2000. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand & Co., New Delhi.

ALLIED PRACTICAL

ZOOLOGY

I MAJOR PRACTICAL

DISSECTIONS

Cockroach: Digestive and nervous system

Prawn: Nervous system

II MINOR PRACTICAL

MOUNTING

1. Mouth parts of **Mosquito** and **Honey bee**
2. **Earthworm** - Body setae
3. Placoid scales of **shark**

III SPOTTERS

Entamoeba, Sycon, Obelia, Taenia solium (entire, scolex) earthworm (entire, Pineal setae) Prawn (entire), Fresh water mussel, Sea star, Amphioxus - Entire, Amphioxus - T.S. through pharynx, Shark, Frog, Calotes, Pigeon, feathers of pigeon and Rabbit.

Sphygmomanometer, Stethoscope, Rain gauge.

REFERENCES:

1. Verma. P.S. 2011. A manual of practical Zoology - INVERTEBRATES. Chand & Co., Ltd., Ram Nagar, New Delhi.
2. Verma. P.S. 2011. A manual of practical Zoology - CHORDATES. Chand & Co., Ltd., Ram Nagar, New Delhi.

SEMESTER III

PAPER - 3

PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

Pteridophytes:

UNIT-I

General characters, Distribution, Classification of Pteridophytes (Reimer 1954). Stellar evolution. Homospory and Heterospory. Origin of seed habits. Apogamy and Apospory.

UNIT-II

Structure and life cycle of the following types (Excluding developmental studies)
1. *Lycopodium* 2. *Selaginella* 3. *Equisetum* 4. *Adiantum* and 5. *Marselia*.

Gymnosperms

UNIT-III

General characters of gymnosperms, Distribution of gymnosperms, Classification of gymnosperms by K.R. Sporne (1965). Economic importance - Detailed study of the following types: 1. *Cycas*, 2. *Pinus*.

Paleobotany

UNIT-IV

Geological time scale. Radio carbon dating. Types of fossilisation - Impressions, compressions, casts, molds, petrifications, and coal balls. Importance of the study of palaeobotany.

UNIT-V

Nomenclature of fossil plants. Brief study of the following fossils: *Lepidodendron*, *Lepidocarpon*, *Calamites* and *Williamsonia*.

BOOKS SUGGESTED:

1. Smith, G.M. 1972. Cryptogamic botany Vol. - II Mc Graw Hill, New Delhi.
2. Sporne, K.R. 1976. Morphology of Pteridophytes, BI Publications. Pvt. Ltd., New Delhi.
3. Pandey B.P. 1977. A Text book of Botany Bryophyta, Pteridophyta and Gymnosperms K.Nath & co. Meerut.
4. Sporne K.R. 1965. Morphology of gymnosperms. B.I. Publications Pvt. Ltd. New Delhi

5. Rashid, A 1976. An Introduction to Pteridophyta Vikas Publishing House Pvt. Ltd., New Delhi
6. Bhatnagar S.P. and A. Moitra 1996. Gymnosperms, New age International publishers (p) Ltd. New Delhi.
7. Margulis. L. and K.V. Schwatz (2nd ed.) 1988. Five Kingdoms: An illustrated Guide to phyla of life on Earth W.H. Freeman & Co. New York.
8. Arnold C.R. 1947. Introduction to Paleobotany. TMH Publishing Co. Ltd., Bombay.
9. Shukla. A and Mishra S.P. 1975. Essentials of Paleobotany. Vikas publishing house Pvt. Ltd. Delhi.
10. Shirpad N. Agashe, 1995. Paleobotany. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
11. Wilson N. Stewart and Gar, W. Rothwell. 2005. Paleobotany and the evolution of plants 2nd Edn., Cambridge University Press, Cambridge, U.K.

ALLIED

CHEMISTRY – I

OBJECTIVE:

- Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1 General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Flux, Slag - Definition - Reduction methods - Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

2.1 Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3 Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation

- Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons – Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3 , PCl_5 , SF_6 and XeF_6 .

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1 Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking –
Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

SKILL BASED SUBJECT

PAPER - 1

HORTICULTURE

UNIT- I

Importance and scope of Horticulture. Types of Gardens – Public Garden, Kitchen Garden, Indoor Garden – Potted Plants, Hanging Baskets, Cut Flowers, Bonsai, Hydroponics and Soilless Production. Garden Components - lawn, trees, shrubs, climbers and creepers, flower beds and borders, hedge and edges, paths, rockery, Water garden and Topiary.

UNIT-II

Plant Propagation Methods – Cutting, Layering, Grafting, Budding, Stock – Scion Relationship. Use of Plant Hormones in Plant Propagation.

UNIT-III

Manures, Role, advantages and disadvantages of important types of fertilizers. Time and Application of Manures, Fertilizers and Plant Regulators. Foliar application of Nutrients. Drip irrigation – Fertigation.

UNIT-IV

Cultivation of Vegetables – Brinjal, Tomato and Onion. Cultivation of Fruits – Banana, Mango and Apple. Cultivation of Flowers – Jasmine, Rose and Orchid. Cultivation of Medicinal Plants – Nilavembu, Sarpagandha and Pepper. Organic Cultivation. Green House – Cultivation of Vegetables, Fruits and Flowers.

UNIT-V

Plant Protection and Weed control. General account of insecticides, fungicides, Pesticides and Biocontrol. Common Diseases of Fruits and Vegetable crops (Apple Scab, Blight of Potato and Banana Bunchy top).

Books Suggested:

1. Bose T.K. & Yadaw, C.P. (1989) commercial flowers, naya prokash Calcutta - India.
2. Bose. T.K. and Mukerijee. D (1987 Gardening in India, Oxford Book house, 66, Janapath, New Delhi-110 001.
3. Chardha K.C. & Pareek (1993) Advance in Horticulture, Vol: 1 - XII Malhotra Publishing House, New Delhi - India.
4. Edmond. J.B. Senn. T.L. Andrews - F.S. and Halfacre. R.G. (1988) Fundamental of Horticulture, Tata MacGraw - Hill Publishing Company Ltd., New Delhi-110 006.
5. Prasad. S and Kumar U. (1999) Principal of Horticulture, Agrobotanica, 4E/176 J.N. Vyasagar, Bikaner, India-334 003.

NON - MAJOR ELECTIVE

PAPER - 1

MEDICINAL BOTANY

Unit - I

Pharmacognosy - Definition and History. A general account of different survey of Different systems of Medicines - Indian systems of medicine – Siddha, Ayurveda and Unani systems. Classification of drugs (elementary). Chemistry of Drugs (Basics).

Unit - II

Morphological studies - Chemical constituents. Therapeutic and other Pharmaceutical uses of Bark - Cinchona, Leaves - Adathoda and Eucalyptus, Flower - Clove.

Unit - III

Fruits and seed - Wood apple, Goosberry and Poppy seed, Underground stem - Ginger, Unorganized drugs. Gum - Acacia, Resin - Turpentine, Fixed oil - Castor oil.

Unit - IV

A brief account of the following: a) Drugs acting on the Central Nervous system b) Drugs used in the disorders of the Gastro Intestinal tract and c) Cardio Vascular drugs. (Five Plant examples for each mentioned above)

Unit - V

Cultivation of medicinal plants in India. Medicinal plants – Genetics, Breeding methods applied to medicinal herbs. Drug Adulteration. Methods of Drug evaluation.

References:

1. Pharmacognosy - GE Trease and WC Evans. E LBSociety. Baelliere Tindall. London.
2. Pharmacognosy & Pharmacotherapeutics. Saroskar and S.D. Bhandarkar Popular Pakashan, Bombay.
3. Textbook of Pharmacognosy- T.E. WALLIS Fifth Edition. CBS Publishers and distributors Delhi.
4. Pharmacognosy - S.S. Handa and V.K. Kapoor second edition. Vallabh Prakash, Delhi.
5. Pharmacognosy - S.S. Handa and V.K. Kapoor second edition CBS publishers and distributors, Delhi.
6. An introduction to Medicinal Botany & Pharmacognosy- N.C Kumar Emkay Publications. New Delhi.
7. Pharmacognosy - C.K. Kokate, A. Purohit and S.R. Gokhale 12th Edition Nirali Prakash
8. A Hand Book of Medicinal Plants, Prajapathi ND Agrobios, Jodhpur.
9. A Hand Book of Medicinal Herbs., Deshpande DJ Agrobios, Jodhpur.

SEMESTER IV

PAPER - 4

CYTOLOGY AND PLANT ANATOMY

UNIT-I

Prokaryotic and Eukaryotic cell. Ultra structure of plant cell, Cell wall with chemistry and function. Structure, Chemistry and function of Cytoplasm and plasma membrane

Cell Organelles: Structure and origin of the following: Endoplasmic Reticulum, Golgi complex, Lysosomes, Mitochondria, Plastids and Ribosomes.

UNIT-II

Structure and Functions of Nucleus, Nucleoplasm, Chromosome, special types of chromosomes - Polytene and Lambrush chromosomes, Nucleic acids - DNA and RNA molecular structure and functions. Replication of DNA

Cell inclusions (Non living): Cystolith, crystals, raphids, starch grains.

Cell divisions - Mitosis and Meiosis and their significances

ANATOMY

UNIT-III

Tissues: Classification - structural characteristics and functions of the following tissues. Meristematic, simple and complex and permanent.

Tissue system - Epidermal and vascular, stomatal types, apical meristem - Theories.

Primary structure of stem and root of Dicotyledons and monocotyledons. Internal structure of leaves of Dicot and monocot.

UNIT-IV

Secondary structure of stem and root of Dicotyledons. Anamalous secondary growth of Dicotyledons stem of Boerhaavia, Nyctanthus.

Secondary growth in monocotyledons. Dracaena.

UNIT-V

Origin and structure of secondary xylem and secondary phloem. Annual rings, heart wood and sapwood, periderm, wound healing, leaf Abscission, Vascular cambium, laticifers, nodal anatomy, uni - tri - multi lacunar nodes.

BOOKS SUGGESTED:

CYTOLOGY

1. Turner, P.C. A.G. MC Lennan. A.D. Bates And M.R.H. White. 1998. Instant Notes in Molecular. Biology. Viva Books Pvt. Ltd. Chennai.
2. Verma.P.S and Agarwal, V.K. 2007. Cytology. S. Chand & Co. Chennai.
3. Wolfe, S.L. 1993. Molecular and Cellular Biology. Wadsworth Publishing Co, Clifornia.

ANATOMY

1. ESAU, Plant Anatomy, 1965 Wiles Eastern, New Delhi.
2. Eams A.J. and Mac Daniel. An Introduction to Plant Anatomy. TMH Edition. Tata MC. Graw Hill Publishing Co.ltd. Bombay - New Delhi.
3. Pande, B.P. 1979. Plant Anatomy. S. Chand & Co, Ram Nagar, New Delhi.

CORE PRACTICAL - 2
(COVERING PAPERS 3 AND 4)

PTERIDOPHYTES

1. Study of morphology, internal structure and reproductive parts of *Lycopodium*, *Selaginella*, *Equisetum*, *Adiantum* and *Marselia*.

GYMNOSPERMS

1. Study of morphology, internal structure and reproductive parts of *Cycas* and *Pinus*.

PALEOBOTANY

1. Study of *Lepidodendron*, *Lepidocarpon*, *Calamites* and *Williamsonia*.

CYTOLOGY

1. Study of structure of plant cell and organelles by electron microscopy pictures from standard books.
2. Study of Cell inclusions (non living)- cystolith, crystals, raphids, starch grains.
3. Study of Mitosis by Squash technique (onion root tip).

ANATOMY

1. Study of simple & Complex tissues (primary and secondary).
2. Study of internal structure of Young and old stem of dicotyledons. Young and Old root of dicotyledons. Normal stem and root of Monocotyledons. Anomalous stem of dicotyledons - *Boerhaavia*, *Nyctanthes* and Monocotyledons - *Dracaena*.
3. Study of internal structure of Dicot and Monocot leaves.
4. Study of stomatal types.
5. Nodal Anatomy: uni, tri, and multi lacunar node.

**ALLIED
CHEMISTRY – II**

OBJECTIVE:

- Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biological functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions - Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1 Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- R_f value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

SKILL BASED SUBJECT
PAPER - 2
MUSHROOM CULTIVATION

UNIT-I

Life cycle of Mushrooms - Identification - edible and poisonous Mushrooms - external factors for growth. Economic importance of Mushrooms as food

UNIT-II

History of mushroom cultivation -- selection - 'starter' - preparation of spawn - preparation of Compost (outdoor and indoor beds) - incubation - Harvesting and marketing

UNIT-III

Spawn production - grain, powder and granular spawn - mother spawn - planting spawn - preparation of culture (Tissue culture and spore culture), preservation and storage of culture - various media (PDA, malt extract, Wheat extract, compost extract)

UNIT-IV

Cultivation of white Button Mushrooms (*Agaricus bisporus*) and Oyster Mushrooms (*Pleurotus* spp) – materials – sterilization – spawning and fruiting – house design for pleurotus – preservation, canning drying, Cultivation of paddy straw Mushrooms – Preparation, Spawn making – Methods of Cultivation.

UNIT-V

Mushroom technology – nutritive value of edible Mushrooms- Medicinal value of Mushrooms, Advantages of Mushrooms Cultivation – Harvesting & Marketing.

LITERATURES:

1. Kannaiyan.S and Ramasamy.K, 1980. A Handbook of Edible Mushroom. Today and Tomorrows. Printers and Publishers, New Delhi, 104 p.
2. Pathak V.N, Nagendra Yadav and Maneesha Gaur. 1998. Mushroom Production and Processing Technology. Agrobios (India) Jodhpur, 179 p.

NON-MAJOR ELECTIVE

PAPER - 2

HORTICULTURE

UNIT- I

Importance and scope of Horticulture. Types of Gardens – Public Garden, Kitchen Garden, Indoor Garden – Potted Plants, Hanging Baskets, Cut Flowers, Bonsai, Hydroponics and Soilless Production. Garden Components - lawn, trees, shrubs, climbers and creepers, flower beds and borders, hedge and edges, paths, rockery, Water garden and Topiary.

UNIT-II

Plant Propagation Methods – Cutting, Layering, Grafting, Budding, Stock – Scion Relationship. Use of Plant Hormones in Plant Propagation.

UNIT-III

Manures, Role, advantages and disadvantages of important types of fertilizers. Time and Application of Manures, Fertilizers and Plant Regulators. Foliar application of Nutrients. Drip irrigation – Fertigation.

UNIT-IV

Cultivation of Vegetables – Brinjal, Tomato and Onion. Cultivation of Fruits – Banana, Mango and Apple. Cultivation of Flowers – Jasmine, Rose and Orchid. Cultivation of Medicinal Plants – Nilavembu, Sarpagandha and Pepper. Organic Cultivation. Green House – Cultivation of Vegetables, Fruits and Flowers.

UNIT-V

Plant Protection and Weed control. General account of insecticides, fungicides, Pesticides and Biocontrol. Common Diseases of Fruits and Vegetable crops (Apple Scab, Blight of Potato and Bunchy top of Banana)

REFERENCE BOOKS:

1. Bose T.K. & Yadaw, C.P. (1989) commercial flowers, naya prokash Calcutta - India.
2. Bose. T.K. and Mukerijee. D (1987) Gardening in India, Oxford Book house, 66, Janapath, New Delhi-110 001.
3. Chardha K.C. & Pareek (1993) Advance in Horticulture, Vol: 1 - XII Malhotra Publishing House, New Delhi - India.
4. Edmond. J.B. Senn. T.L. Andrews - F.S. and Halfacre. R.G. (1988) Fundamental of Horticulture, Tata MacGraw - Hill Publishing Company Ltd., New Delhi-110 006.
5. Prasad. S and Kumar U. (1999) Principal of Horticulture, Agrobotanica, 4E/176 J.N. Vyasnagar, Bikaner, India-334 003.

SEMESTER V

PAPER - 5

MORPHOLOGY AND EMBRYOLOGY OF ANGIOSPERMS

UNIT - I

Morphology – Root System, Modification of Roots, Shoot System, Modification of Stem, The leaf – Structure of a Leaf, Stipules, Phyllotaxy, Leaf shape, leaf margin, leaf apex, leaf surface, leaf texture, leaf venation, types of leaves, modification of leaves. Buds. Prefoliation, Vernation.

UNIT – II

Inflorescence – Types of inflorescence, Flower parts, symmetry, form, position of the ovary, perianth, calyx, corolla, forms of corolla, Aestivation. Androecium – attachment of anthers, dehiscence of anthers, union of Stamens, length of stamens, nature of Stamens and Pollen.

UNIT – III

Gynoecium – Types, fusion of carpels, Placentation, Ovule types. Types of Pollination. Fruits types, Dispersal of Fruits and seeds.

UNIT-IV

Structure and development of anther, structure of mature pollen and Male gametophyte. Structure and development of ovule. Female gametophyte Monosporic (Polygonum type) Fertilization - Double fertilization - Syngamy - triple fusion - post fertilization changes.

UNIT-V

Endosperm types - nuclear, cellular - helobial - Ruminant endosperms, function of endosperms

Development of embryo in Dicot (Capsella) and Monocot (Najas).

A brief account on Polyembryony, parthenocarpy.

REFERENCE BOOKS:

1. Bhojwani, S.S. and Bhatnagar, S.P. 1981. Embryology of angiosperms. Vikas Publication Pvt.Ltd. New Delhi. Eames, A.J and Mac Daniel, 1975.
2. Johri, B.M, 1984. Embryology of Angiosperms. Springer- Verlag.
3. Maheshwari, P. 1963. An Introduction to embryology of Angiosperms. Tata Mc Grow Hill. Newyork.
4. Singh.V., P.C. Pandey and D.K.Jain. 2003. Embryology of Angiosperms. Rastogi Publications. Meerut.

PAPER – 6

TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY

TAXONOMY OF ANGIOSPERMS:

UNIT-I

Principles of Taxonomy, Taxonomy and its importance. Herbarium technique, Botanical survey of India. Systems of Classification: Outline classification of Bentham & Hooker.

Taxonomic hierarchy (major and minor categories)

Plant Nomenclature - Forms of Scientific names.

UNIT-II

Concept of a taxon: A brief reference to citation of author.

Chemotaxonomy. Numerical taxonomy and Molecular Taxonomy.

UNIT-III

Detail study of the range of Characters and plants of economical importance in the following families after introduction of important technologies in morphological features:

Annonaceae, Rutaceae, Cucurbitaceae, Asclepiadaceae, Convolvulaceae, Verbenaceae, Euphorbiaceae, Amaranthaceae, Poaceae and Liliaceae.

UNIT-IV

Economic Botany – Fibre types: Fibre yielding plants, Principal Woods of India. Medicinal Plants: Drugs obtained from roots, underground stems, barks, stems, leaves, flowers, fruits, seeds and entire plants.

UNIT-V

Spices and condiments: Spices obtained from roots, underground stems, barks, flower buds and flower, fruits, seed and Leaves. Fatty oils. Oil Yielding Plants.

REFERENCE BOOKS:

1. Davis, P.H. & V.H. Heywood, 1968. Principles of Angiosperm Taxonomy, Oliver & Boyd Edinburgh & London.
2. Pandey.B.P. 2009. Taxonomy of Angiosperms. S.Chand & Co. Ltd. New Delhi.
3. Jain, S.K.and R,R,Rao, 1977. A handbook of field and herbarium methods. Today and tomorrow's printers and publishers, New Delhi.
4. Sivarajan, V.V., 1999. Principles of plant taxonomy, Oxford and IBH Stace, C.A, 1989. Plant taxonomy and Biosystematics. Edward Arnold, London.

PAPER - 7

GENETICS, PLANT BREEDING, EVOLUTION AND BIOSTATISTICS

UNIT-I

Mono hybrid and Dihybrid cross, test cross, back cross, Mendel's Laws. Deviation from Mandelian ratio – incomplete dominance, lethal factor, complementary factor, supplementary factor, duplicate, Epistasis and inhibitory. Polygenic inheritance – Inheritance of Wheat Kernal and hair length in Maize.

UNIT-II

Linkage – Crossing over and recombination. Gene Mapping. Chromosome theory of inheritance. Sex determination in plants, Sex Linked Inheritance, sex linked diseases, haemophilia, colour blindness. Extra nuclear inheritance - male sterility in corn, population genetics, Hardy - Weinbergs principles.

UNIT-III

Gene concept: Biochemical mutant in Neurospora, splitgene, exon, intron, cistron, recon, muton, gene regulation, operon concept, control system in lac, (lac operons), gene expression in eukaryotes.

UNIT-IV

Plant Breeding: Objectives, Plant introduction, selection, hybridization techniques, Hybrid Vigor, heterosis, Interspecific and intergeneric. Polyploidy and its applications in plant breeding. Breeding for crop improvement for paddy, *Gajanus gajan* and Sugarcane.

UNIT-V

Evolution: Origin of life, Evolutionary theories of Lamarck, Drawin, De Vries, Modern synthetic theory of evolution.

Biostatistics: Mean, median, mode and standard deviations, standard errors.

REFERENCES BOOKS:

1. Gupta, P.K, 2000. Gentic. Rasatogi publications, Meerut.
2. Singh,B.D. 1996. Principles of plant breeding. Oxford IBH. New Delhi.
3. Singh,B.D. 2001. Plant Breeding, Principles and Methods. Kalyani Publications, , New Delhi Singh.B.D.2005.Genetics.Kalyani Publishers. New Delhi.
4. Vijendra Das, L.D. 2005. Genetics and Plant Breeding, New Age International (P) Ltd., New Delhi.

ELECTIVE

PAPER - 1

A. TISSUE CULTURE

UNIT-I

History of plant tissue culture research - Basic principles of plant tissue - Totipotency of cells, differentiation, dedifferentiation and redifferentiation.

UNIT-II

Methodology - Sterilization (physical and chemical methods), Plant cell culture methods, Culture media, MS and B5, Phytohormones, Callus induction

UNIT-III

Organ culture, Shoot tip Culture, Apical Meristem culture, Ovary Culture, Ovule Culture, Endosperm Culture, Embryo culture – application of Embryo rescue technique. Callus subculture maintenance, Metabolic patterns in callus culture, Harvesting and measurements, Morphogenesis in callus culture.

UNIT-IV

Synthetic Seeds – Limitation of synthetic seeds, production of synthetic seeds, artificial seeds, use of artificial seeds(Commercial production and Uses) Protoplast isolation and purification and culture, media (F5- Medium Frearson et al 1973 Nagata and Takeba 1971, Modified B5 Medium), Methods of isolation (Enzymatic Isolation), Isolation from leaves, shoot and root apex, root storage organs, Pollen grain etc, Protoplast fusion.

UNIT-V

Tissue culture and crop improvement - Agro bacterium mediated gene transfer technology - microinjection - particle bombardment; Bioreactors in plant tissue culture.

REFERENCES BOOKS:

1. Brown C. W and Thorpe T. A 1984 Cell culture and Somatic Cell Genetics of plants, Academic Press Orlando.
2. Chu, C 1978 Plant Tissue Culture, Peking Science Press, Peking.
3. Gamborg O. L and Phillips. G.G. 1975 Plant Cell, Tissue culture and Organ culture Fundamental Methods. Narosa Publishing House, New Delhi.
4. Evans D. A, Sharp W. A, Amirato, P. V., Yamada, Y 1983 Ed. Hand Book of Plant Cell Culture, Macmillan, New York.
5. Street, H. E. 1977 Plant Tissue and Cell Culture - Botanical Monograph, Blackwell Scientific Publications.

PAPER I

B. PLANT PATHOLOGY

UNIT-I

A brief history of plant pathology; Principles of plant pathology; Symptomatology- study of infection- entry of fungal, bacterial and viral pathogens; Leaf spot, Blight, Wilt, Rot, Rust, Smut, Powdery mildew, Downy mildew, Leaf mosaic and Phyllody.

UNIT-II

Classifications of plant diseases, Dissemination of pathogens-spore dispersal, role of vectors in viral transmission, influence of weather-wind, temperature and humidity.

UNIT-III

Disease resistance-morphological, cytological, biochemical and genetical. Cross protection. Role of toxins and enzymes in plant pathogenesis.

UNIT-IV

Modern methods of disease forecast- epiphytotics- causes, course, decline and prophylaxis; Cultural, Control of plant diseases, Plant protection-Prevention; eradication-chemical, biological, genetical- breeding, hybridization- immunization.

UNIT-V

Study of the following Plant diseases:

- a) Blast disease of Rice
- b) Red rot of Sugarcane
- c) Tikka of Ground-nut
- d) Bacterial blight of Rice
- e) Citrus canker
- f) Leaf curl of Papaya
- g) Fusarium wilt of Cotton.

REFERENCE BOOKS:

1. Plant pathology by G.P.Gupta
2. Illustrated dictionary of Plant pathology Vyas, N.L
3. Microbial Plant pathology- Whitney, P.J
4. Plant pathology- Singh, R.S.
5. Plant pathology-Mehortra, R.S.
6. Introduction to principle of Plant pathology ed.3- Singh, R.S.
7. Lab. Manual of Plant pathology- Pathak U.N
8. Text book of Modern Plant pathology- Bilgrami.K.S & Dube.

PAPER - 1

C. BIOFERTILIZERS

UNIT – I

General account about the microbes used as biofertilizer – Rhizobium – isolation, identification, mass cultivation, carrier based inoculants, symbiosis.

UNIT – II

Azospirillum, isolation and mass cultivation – carrier based inoculant, associative effect of different microorganisms. Azotobacter – classification, characteristics – crop response to Azotobacter inoculum, maintenance and mass cultivation.

UNIT – III

Cyanobacteria (blue green algae), Azolla and Anabaena azolla association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation.

UNIT – IV

VA-Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.

UNIT – V

Organic farming – Green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermin composting – field Application.

REFERENCE BOOKS:

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas, S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic Farming Akta Prakashan, Nadiad.

SKILL BASED SUBJECT

PAPER - 3

HERBAL SCIENCE

UNIT-I

Pharmacognosy - Definition and History. Different systems of Medicines - Indian systems of medicine – Siddha, Ayurveda and Unani systems. Classification of drugs (elementary). Chemistry of Drugs (Basics). Branches of Pharmacognosy and phytochemicals - reserve materials; Secretory materials; excretory materials.

UNIT-II

Medicinal gardening – in the Hills and plains; house gardens; plants for gardening. Poisonous plants- Types of plant poison; action of poisons; treatment of Poisons with an example.

UNIT-III

Morphological studies - Chemical constituents. Therapeutic and other Pharmaceutical uses of Bark - Cinchona, Leaves - Adathoda and Eucalyptus, Flower - Clove. Fruits and seed - Wood apple, Gooseberry and Poppy seed, Underground stem - Ginger, Unorganized drugs. Gum - Acacia, Resin - Turpentine, Fixed oil - Castor oil. Exports values of medicinal plants.

UNIT-IV

Botanical description and active principle of root drugs; rhizome, woods and bark drugs.

Botanical description and active principle of leaves; flowers; fruits; seeds and entire plants as drugs.

UNIT-V

Cultivation of medicinal plants in India. Breeding methods applied to medicinal plants. Herbal medicine preparation: Decoction, infusion, syrup, tincture and poultice. Food: herbal salad, chutney, soup and Tea

REFERENCE BOOKS:

1. C.K. Kokale, C.K. Kokate & Purohit – Pharmacognosy, Nirali Prakasan, New Delhi.
2. E.Edwin Jerald & Sheeja Edwin Jerald – Text Book of Pharmacognosy and Phytochemistry, CBS Publishers & Dist., NewDelhi.
3. A Hand Book of Medicinal Plants, Prajapathi ND Agrobios. Jodhpur
4. A Hand Book of Medicinal Herbs, Deshpande DJ Agrobios. Jodhpur.

SEMESTER VI

PAPER - 8

PLANT PHYSIOLOGY AND PLANT BIOCHEMISTRY

PLANT PHYSIOLOGY

UNIT-I

Water uptake, Osmosis, Translocation of water, ascent of sap, transpiration, stomatal physiology, water stress and its significance. Mineral nutrition - micro and macronutrients and their deficiency symptoms. Growth measurement -growth curve. Plant growth regulators: auxins, gibberellins, cytokinins and ethylene, their regulation and application in agriculture. Photoperiodism, vernalization, phytochrome.

UNIT-II

Photosynthesis - Radiant energy, Absorption spectrum, Action spectrum - structure of Photosynthetic pigments, - Red Drop Phenomena, Enhancement effect. Cyclic and Non - cyclic photophosphorylation, C3 and C4 pathways, photorespiration.

PLANT BIOCHEMISTRY:

UNIT-III

Classification, structure and Properties of Carbohydrates, Lipids and Proteins. Enzymes - Properties, Nomenclature and classification as per ECIUB (Enzyme commission of the international Union Biochemistry) - Cofactor - Co - enzymes and factors affecting enzyme action.

UNIT-IV

Respiration - Aerobic, Anaerobic: Glycolysis - Krebs's cycle - Oxidation - Reduction potential - ATP synthesis, bioenergetics - factors affecting respiration. Respiration as an amphibolic process.

UNIT-V

Nitrogen metabolism: sources of nitrogen, role of Nitrogen, Conversion of nitrate to ammonia - assimilation of ammonia. urea cycle, mechanism of biological nitrogen fixation. Protein synthesis and Genetic code.

PAPER - 9

ECOLOGY AND PHYTOGEOGRAPHY

UNIT – I

ECOLOGY

Biotic and abiotic factors and their influence on vegetation – a brief account of microbes, plants, animals, soil, wind, light, temperature, rainfall and fire. Biogeochemical cycles (Nitrogen, Carbon)

UNIT – II

Ecosystem – concept, processes and components. Food chain, food web, energy flow, pyramids. Types of ecosystems - fresh water, marine and grassland.

UNIT – III

Autecology and Synecology – Vegetation – Formation, Association, Consociation, Society – development of vegetation. Migration – ecesis, colonization, Methods of study of vegetation (Quadrat and transect). Plant succession – Hydrosere and Xerosere. Morphological and anatomical features of hydrophytes, mesophytes and Xerophytes

UNIT – IV

Pollution -air, water, soil, noise, thermal, radiation and its control. Agricultural pollution, insecticides, pesticides, fungicides, herbicides. wastewater treatment.

UNIT – V

PHYTOGEOGRAPHY

Phytogeography – principles – vegetation types in India. Tropical rain forest, Sholas and Deciduous Forest – Sand dunes and Mangrove vegetation and Scrubjungle, phytogeographical regions of India.

PAPER - 10

BIODIVERSITY, BIOINFORMATICS AND TOXICOLOGY

UNIT-I

BIODIVERSITY: Definition-Values and uses of biodiversity-biodiversity at global, national (India) and local levels. Hotspots, threats to biodiversity-conservation of biodiversity.

UNIT-II

Biodiversity-ecological species and genetic species concept-classical and modern, inter and intra specific species diversity. Allopatric and sympatric speciation-endemism, relics and paleoendemism.

BIOINFORMATICS

UNIT-III

Introduction to computers, components of computer, fundamental of networking, internet, intranet, search engines- yahoo, Google, etc. telnet, ftp, introduction to databases.

UNIT-IV

Introduction to bioinformatics, scope, biological databases- NCBI, EMBL and DDBJ. Pairwise sequence analysis, local and global alignment, BLAST and FASTA, DNA sequencing methods. protein sequencing.

TOXICOLOGY

UNIT-V

Environmental toxicants-classification-occurrence-source-effects on plants. Heavy metal toxicity-lead and chromium-bioaccumulation. Atmospheric toxicants-carbon monoxides, sulphur oxides.

BOOKS/REFERENCES SUGGESTED:

1. Fankel, O.H., Brown, A.H.D and Bouden, J.J. The conservation of plant biodiversity.
2. Kalavathy, S (E.D) 2004, environmental studies, Bishop Heber college Pub., Trichy.
3. Rajamannar, 2004 Environmental studies EVR College Pub. Trichy.
4. Bioinformatics, a practical guide to the analysis of Genes and proteins by A.D Baxevanis and B.F.Quelliettee.
5. Gibas and Jamback, developing bioinformatics computer skills, O.Reilly Associates.
6. Sharma, P.D. 1993, Environmental biology and toxicology. Rastogi and co, Meerut.

CORE PRACTICAL -3
(COVERING PAPER 5, 6 & 7)

PRACTICAL:

TAXONOMY:

1. Morphology study of root, stem, leaf and inflorescence. Fruit types with suitable example.

EMBRYOLOGY:

1. T.S. anther at various stages of development (permanent slide)
2. Types of ovule (permanent slide)
3. Male gametophyte, Female Gametophyte.
4. Embryo sac (permanent slide)
5. Stages in the development of dicot and monocot embryos (slide)
6. Mounting of Dicot embryos (Globular, Heart shaped stage)
7. Types of Endosperms (Permanent slide)

REFERENCE BOOKS:

TAXONOMY:

1. Annie Ragland, 1999. Fundamentals of botany Vol.3. Saras publication.

EMBRYOLOGY BOOKS

1. Bhojwani. S.S. and Bhatnagar. S.P. 1978. The embryology of Angiosperms. Vikas Publishing Pvt. Ltd., Delhi.
2. Maheswari P.1971. An introduction to embryology of Angiosperms Tata Mc Graw Hill, Delhi.
3. Swamy B.G.L. and Krishnamurthy K.V. 1950. From flower to fruit. Tata Mc Graw Hill, New Delhi.

PRACTICAL:

TAXONOMY

1. A detailed study of the range of vegetative and floral characters of plants belonging to the families mentioned in the theory part.
2. Submission of 15 herbarium sheet with proper field note book for practical examination.
3. Field trips to places within or outside the state for seven days for plant collection and also to study the plants in their natural habitats.
4. Economic botany.

REFERENCE BOOKS:

TAXONOMY:

1. Singh, V. and Jain, D.K - Taxonomy of Angiosperms - Rastogi Publications, Meerut.
2. Pandey, B.P. 2007 Botany for Degree Students. S. Chand & Co. New Delhi.
3. Vasishta, P.C. 1974 Taxonomy of Angiosperms. S. Chand & Co., Chennai.

ECONOMIC BOTANY:

1. Hill AW. 1951 Economic Botany - Mc Graw Hill, New Delhi.
2. Pandey, B.P., Economic Botany, S.Chand & Co., NewDelhi.

GENETICS:

PRACTICAL

1. Simple problems on Monohybrid and Dihybrid ratio and interaction of factors.
2. Construction of chromosome maps using three - point test cross data.
3. Hybridization techniques - Emasculation, Bagging (For demonstration only)

REFERENCES:

1. Allard, R.W. 1960. Principal of plant breeding. John wileg, NEWYORK.
2. Gupta, P.K. 2000. Genetics. Rastogi publications. Meerut.
3. Sinnott, E.W; L.C. Dunn and T. Dobzhansky 1958. Principle of genetics. McGraw Hill, Newyork.
4. Verma, P.S and Agarwal. V.K. 2007. Genetics. S. Chand & Co. Chennai.

CORE PRACTICAL

PAPER 8, 9 & 10

I. List of physiology experiments:

1. Determination of solute potential by plasmolytic method.
2. Colorimetric determination of effect of solvents and temperature on membrane permeability.
3. Separation of plant pigments by paper chromatography.
4. Study the rate of photosynthesis under different light intensities.
5. Study the rate of photosynthesis under different CO₂ concentrations.
6. Determination of respiration rate under different substrates using respiroscope method.

II. List of Biochemistry experiments:

1. Preparation of standard graph for KmNO₄ by using colorimetric method.
2. Qualitative test for amino acid and protein.
3. Qualitative test for sugars (Glucose, sucrose & starch)

III. DEMONSTRATION EXPERIMENTS IN PLANT PHYSIOLOGY AND BIOCHEMISTRY:

1. Fermentation experiment.
2. Study of relative rates of transpiration of different plants.
3. Assay of protease or amylase.
4. Test for alkaloid.
5. Induction of roots by auxins.
6. Effect of temperature, pH on enzyme activity.

IV ECOLOGY & PHYTOGEOGRAPHY

1. Study of morphological and internal structural adaptations of locally available hydrophytes, xerophytes, mesophytes and epiphytes. Eg. Hydrophyte: Nymphaea, Hydrilla. Xerophytes: Nerium, Casuarina. Mesophytes: Tridax, Vernonia. Epiphytes: Vanda
2. Construction of meter quadrat – to study the percentage of frequency & abundance.
3. Map of phytogeographical regions of India

V BIODIVERSITY, BIOINFORMATICS AND TOXICOLOGY

1. Map of Hotspots
2. Procedure for BLAST, FAST.
3. Procedure for pairwise sequence analysis.

REFERENCE BOOKS:

1. Bidwell .R.G.S. 1974. Plant Physiology. Macmillan. Publication Co. Newyork.
2. Ting. I.P. 1982 Plant Physiology. Addison Wesley Publication Co. Philippines.
3. Conn. E.E.; P.K. Stumps; G. Brueming and Doi. R.G. 1987. Outlines of Biochemistry. John wiley & Co. Newyork.
4. Rastpgo, S, N. Mendinatta and P. Rastogi. 2003. Bio-informatics—Concepts, skills and application. CBS. publication, New Delhi.

ELECTIVE

PAPER - 3

A. PLANT BIOTECHNOLOGY

UNIT-I

Introduction to plant Biotechnology, scope; Plant genome organization - chloroplast genome; nucleosome; C-value paradox; TATA box.

UNIT-II

Genetic engineering - Basic principles, Restriction endonucleases; Cloning vectors – plasmids, phages and cosmids, Transposans; Methods of gene transfer – electroporation, viral vectors, particle gun method and microinjection; Ti plasmid mediated transfer –*Agrobacterium tumefaciens*. Genetic manipulation of eukaryotic cells.

UNIT-III

Methodology to develop transgenic plant - herbicides resistance, drought resistance, pests and insects resistance and pathogens resistance. Biocontrol of plant diseases and pest. Molecular farming - edible vaccines; Flavr savr tomato.

UNIT-IV

Plant as a bioreactor, Production of primary and secondary metabolites by plant tissue culture. Algal biotechnology - Algal biomass production and maintenance. Fungal biotechnology - single cell protein production.

UNIT-V

Intellectual property rights – Private public sector issues – Physical property and intellectual property – Farmers rights – Plant breeders' right – trade secrets. Patents – Patenting of biological Materials – patents for higher plants and microbes – Patenting transgenic organisms.

BOOKS/REFERENCES SUGGESTED:

1. Dubey. R.C. 2006. A text book of Biotechnology. S. Chand & Co. New Delhi - 110055
2. Brown, C.W.I Cambell and F.G. Priest 1987. Introduction to biotechnology. Blackwell scientific publishers. Oxford.
3. Ignacimuthu.S 1996. Basic biotechnology, Tata Mc Graw Hill publishing Co. Ltd. NewDelhi.

ELECTIVE
PAPER - 2
B. SEED BIOLOGY

UNIT – I

Classification of seeds. Morphology and structural details of seeds Cereals: Paddy and Wheat, Pulses: Dolichos and Glycine, Oil seeds: Castor, Fibers: Cotton, Vegetables: Cucurbita. Study on importance of seed.

UNIT – II

Chemical composition of seeds mentioned above. Germination - General account. Factors affecting germination. Changes that take place during germination (physical and chemical) Treatments given to quicken germination.

UNIT – III

Epigeal and Hypogeal germination, Germination mechanism. Seed germination test under laboratory conditions using paper (BP & TP) sand and soil. Germination ecology: Environmental factors and germination behaviour.

UNIT – IV

Seed viability; Topographical Tetrazolium Test. Preparation of solution and methods of application & evaluation. Seed vigour: Concept, Direct and Indirect vigour tests.

UNIT – V

Dormancy – Primary and secondary dormancies. Significance, factors involved, methods used to break dormancy.

REFERENCE BOOKS:

1. Mayer A. M & Poljakoff Mayer – 1975. Germination of seeds –
2. Bryant J . A 1985. Seed physiology --Edward Arnold, London.
3. Rattan Lal Agarwal. Seed technology — 2nd edn .
4. B. P. Pandey. Economic Botany –

ELECTIVE

PAPER - 2

C. ETHNOBOTANY

UNIT-I

Ethnobotany: Introduction, concept, scope and objectives. Ethnobotany as an interdisciplinary science. The relevance of ethno botany in the present context. Major ethnic groups in Tamilnadu. (Any five)

UNIT-II

Methodology of Ethno botanical studies. a) Field work b) Herbarium c) Ancient Literature d) Temples and sacred places. Plants used by the tribals: a) Food plants b) intoxicants and beverages c) Resins and oils and miscellaneous uses.

UNIT-III

Plants and Tribal medicine: Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a) *Azadiractha indica* b) *Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris* f) *Pongamia pinnata* g) *Cassia auriculata* h) *Indigofera tinctoria*. Role of ethnobotany in modern medicine with special example *Rauwolfia serpentina*., *Trichopus zeylanicus*.

UNIT-IV

Role of ethnic groups in conservation of plant genetic resources. Participatory forest management. Sharing of wealth concept with few examples from India.

Unit-V

Ethnobotany as a source of drug. a) Reserpine b) Artemisin c) Gugulipid d) Cocaine e) Strychnine.

REFERENCE BOOKS:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi – 1981
3. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
4. S.K. Jain, 1990. Contributions of Indian ethnobotany. Scientific publishers, Jodhpur.
5. Cotton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons –Chichester
6. Rajiv K. Sinha – Ethnobotany The Renaissance of Traditional Herbal Medicine – INA –SHREE Publishers, Jaipur-1996
7. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd. London
8. Gary J Martin, 2008. Ethnobotany A Methods manual, Earth scan, London.

ELECTIVE

PAPER - 3

A. MICROBIOLOGY

UNIT-I

Introduction to microbiology - Scope of microbiology, history of microbiology, classification and nomenclature of microorganisms. Wittaker's five kingdom concept. microscopic examination of microorganisms.

UNIT-II

Methods of isolation of algae, fungi, cyanobacteria from soil and water samples. Staining techniques like Gram's staining, acid fast and flagellar staining. Bacterial culture, growth curve

UNIT-III

structural organization and multiplication of bacteria (E.coli), virus (TMV), bacteriophage (T4), fungi (Yeast), algae (Chlorella & Nostoc), actinomycetes and mycoplasma.

UNIT-IV

control of microorganisms -physical and chemical methods. general account of microorganisms involved in human diseases, (Skin diseases, respiratory disorders). General account of microbes used as biofertilizers and P solubilizers. Mass production of Rhizobium, Azospirillum.

UNIT-V

Microbial products: Production of penicillin, enzymes - chitinase, protease, organic acid - citric acid and vitamin (B12). Biopesticides; microorganisms and pollution control.

REFERENCE BOOKS:

1. Pelczar, MJ.; JR. E.C.S. Chan and Noel R. Krieg. (Ed) Text book of Microbiology Tata Mc Graw Hill. Co. New Delhi. India.
2. Prescott LM., Harley JP, and Klein DA. Microbiology, 3rd Edition, Wm. C. Brown Publishers, 1996.
3. Patel AH 2005. Industrial Micro Biology. Published by Macmillan India Ltd., new Delhi.

ELECTIVE

PAPER - 3

B. BIOSTATISTICS & COMPUTER APPLICATION IN BOTANY

UNIT-I

Biostatistics – Definition, Application and scope of biostatistics; statistical terms and symbols; Primary data and secondary data; methods of data collection; methods of sampling. census vs sampling.

UNIT-II

Processing of data - classification, tabulation; Frequency distribution; Diagrammatic representation - line diagram, bar diagram, pie diagram and cartogram; graphic representation.

UNIT-III

Measures of central tendency – mean, median and mode; measure of dispersion- standard deviation, standard error; correlation analysis- kinds and degree; Chi square test for goodness of fit.

UNIT-IV

History of computers, Types of Computers, Basic computer concepts, parts of a computer-input (key board, Mouse) and Output devices (Monitors, Printers), computer memory (RAM,ROM), Storage Devices (Floppy disk, Compact disk, Hard disk), Central Processing Unit, Software, Hardware, Computer peripherals – Mouse, Modem.

UNIT-V

Computer Network (LAN,WAN), DATA-Representation- Number systems- Binary, arithmetic, Organizing information- the database – definition-Data entry indexing – storage – retrieval – Operating systems – WINDOWS 2000, Word Processing software MS-Office. Introduction to DESKTOP PRINTING (DTP).

REFERENCE BOOKS:

1. Mandal & Nambiar : Agricultural Statistics, Agrobios Publications, Jodhpur
2. P. Parihar: Biostatistics & Biometry, Agrobios Publications, Jodhpur
3. S. Palanichamy & M. Manoharan : Statistical methods for Biologists, Palani Paramount publications, New Delhi
4. N. Ramakrishnan: Fundamentals of Biostatistics, Sarao Publications, Naaagercoil
5. Peter Norton: Introduction to Computers, Tata MC Graw Hill Publishing Co., New Delhi-34
6. Ramesh Bangia: The Complete Computer course Cyber Tech. Publishers, New Delhi
7. M. Lotia, P. Nir & P. Lotia, Modern Computer Hardware course BPB Publishers, New Delhi
8. Texali: Lordstar professional 4.0 made simple. Tata Mc Graw Hill Publishing Co., New Delhi.

ELECTIVE

PAPER - 3

C. HERBAL HOME REMEDIES AND WATER MANAGEMENT

UNIT-I

History and role of the herbs in day-to-day life. Beneficial aspects of herbal plants as food -common greens, vegetables and edible oils (general account only). Study of some common plants which are used as medicine -*Calotropis gigantea*, *Centella asiatica*, *Cissus quadrangularis*, *Rosa centifolia*, *Piper betel*, *Ocimum sanctum*, *Azadirachta indica*, *Curcuma longa*, *Zingiber officinalis* and *Lawsonia inermis*.

UNIT-II

Herbal remedies - herbal first aid, home remedies-for common cold, fever, headaches, migraines and digestive disorders, ear, eye, mouth and throat infections. Skin care using herbal products.

WATER MANAGEMENT:

UNIT-III

Water-chemical properties and biological importance. Potable water, Measurement of water quality, BOD, COD, evaluation of drinking water quality.

UNIT-IV

Water pollution- industrial, Agricultural and heavy metal pollution. Water quality in and around industrial sites. Sewage treatment. Drinking water treatment

UNIT-V

Water management, recreational aspects of water - quality of swimming pool water. Water quality monitoring. Environmental impact assessment.

REFERENCE BOOKS:

1. T.V. SAIRAM, 1999. Home Remedies Vol-I-V
2. R.Bentley and H. Trimmen 2000. Medicinal Plants Vol-I-III
3. O.LONGMAN 1997.Indian Medicinal Plants Vol-I-V
4. Dwivedi, P. 2004, Environmental pollution and Environmental management. Scientific publishers India.
5. Tripathi, G. and Pandey, G.C. 2001. Current topics in environmental sciences.
6. Trivedy, R.K. 2000. Aquatic pollution and toxicology
7. Rama Raju, P.V. and Murali Krishna, 1998. Environmental sanitation. Environmental protection Society, Kakida.

SKILL BASED SUBJECT

PAPER - 4

MICRO TECHNIQUE

UNIT-I

Principle, instrumentation and applications of Light Microscopy, Transmission Electron Microscope (TEM) and Scanning electron Microscope (SEM).

UNIT-II

Microphotography - Principles - Working Mechanism. Camera lucida - Working principles and uses. Micrometry - Stage and ocular micrometer - method of measurement - uses.

UNIT-III

Microtechnical Process - Principles - Techniques - Killing, Fixation and Fixatives, clearing and embedding. Stains - types - staining procedures.

UNIT-IV

Microscopic preparations - Temporary, Semi - Permanent and Permanent, Special techniques - Whole mount - Smear - Squash - Maceration.

UNIT-V

Types of Microtomes and their uses; Rotary Microtome - Rocking Microtome - Sledge microtome.

REFERENCE BOOKS:

1. Alan peacock H.1966 Elementary Microtechnique Edward Arnold (Pub) Ltd.
2. Duddington - C.L. 1960 Practical Microscopy, Pitman.
3. Cray P.Hand Book of Basic Microtechnique. Mac - Graw Hill, New Delhi.
4. Johnson D.A. 1940 Plant Microtechnique. Mac - Graw Hill, New Delhi.
5. MC Clung, C.L.1961, Hand book of Microscopical Technique.
6. Patki L.R.1992 An Introduction to Microtechnique S.Chand & Company, New Delhi.
7. Prasad & Prasad 2000 Emkay Publications, Delhi.
8. Puru's M.J.et al 1966 Laboratory Techniques in Botany Butter Worths.

THIRUVALLUVAR UNIVERSITY

B.Sc., CHEMISTRY DEGREE COURSE

CBCS PATTERN

(With effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | | Maximum Marks | | |
|-------------|------|-----------------------|-------------|-------------------|--------|---|--|---------------|-----------|-------|
| | | Course Title | | | | | | | | |
| SEMESTER I | | | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 6 | General Chemistry - I | | 25 | 75 | 100 |
| | III | Core Practical | Practical-1 | 3 | 0 | Volumetric Analysis | | 0 | 0 | 0 |
| 4 | III | Allied -1 | Paper-1 | 4 | 4 | Any one from 1. Physics –I 2. Botany –I 3. Zoology –I 4. Biochemistry – I 5. Mathematics – I* | | 25 | 75 | 100 |
| | III | Allied Practical | Practical-1 | 3 | 0 | Allied practical-1 | | 0 | 0 | 0 |
| 5 | IV | Environmental Studies | | 2 | 2 | Environmental studies | | 25 | 75 | 100 |
| | | | | 30 | 20 | | | 125 | 375 | 500 |
| | | | | | | | | | | |
| SEMESTER II | | | | | | | | CIA | Uni. Exam | Total |
| 6 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | | 25 | 75 | 100 |
| 7 | II | English | Paper-2 | 4 | 4 | English | | 25 | 75 | 100 |
| 8 | III | Core Theory | Paper-2 | 6 | 5 | General Chemistry - II | | 25 | 75 | 100 |
| 9 | III | Core Practical | Practical-1 | 3 | 3 | Volumetric Analysis | | 25 | 75 | 100 |
| 10 | III | Allied-1 | Paper-2 | 4 | 4 | Any one from 1. Physics –II 2. Botany –II 3. Zoology –II 4. Biochemistry – II 5. Mathematics – II* | | 25 | 75 | 100 |
| 11 | III | Allied Practical | Practical-1 | 3 | 2 | Allied practical-1 | | 25 | 75 | 100 |

| S.NO. | Part | Study Components | | Ins. hrs | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------|-------------|----------|--------|---|---------------|-----------|-------|
| | | Course Title | | /week | | | | | |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | IV | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| | | | | 30 | 25 | | 150 | 650 | 800 |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-3 | 3 | 3 | General Chemistry – III | 25 | 75 | 100 |
| | III | Core Practical | Practical-2 | 3 | 0 | Inorganic Qualitative Analysis & Preparations | 0 | 0 | 0 |
| 17 | III | ALLIED-2 | Paper-3 | 4 | 4 | Any one from 1. Physics –I 2. Botany –I 3. Zoology –I 4. Biochemistry – I 5. Mathematics – I* | 25 | 75 | 100 |
| | III | Allied Practical | Practical-2 | 3 | 0 | Allied practical-II | 0 | 0 | 0 |
| 18 | IV | Skill Based Subject | Paper-1 | 3 | 3 | Water Treatment and Analysis | 25 | 75 | 100 |
| 19 | IV | Non-Major Elective | Paper-1 | 2 | 2 | Medicinal Chemistry | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 20 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 21 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 22 | III | Core Theory | Paper-4 | 3 | 3 | General Chemistry - IV | 25 | 75 | 100 |
| 23 | III | Core Practical | Practical-2 | 3 | 3 | Inorganic Qualitative Analysis & Preparations | 25 | 75 | 100 |
| 24 | III | Allied-2 | Paper-4 | 4 | 4 | Any one from 1. Physics –II 2. Botany –II 3. Zoology –II 4. Biochemistry – II 5. Mathematics – II* | 25 | 75 | 100 |
| 25 | III | Allied Practical | Practical-2 | 3 | 2 | Allied practical-II | 25 | 75 | 100 |
| 26 | IV | Skill Based Subject | Paper-2 | 3 | 3 | Food Chemistry | 25 | 75 | 100 |
| 27 | IV | Non-Major Elective | Paper-2 | 2 | 2 | Chemistry in Every Day Life | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |

| S.NO. | Part | Study Components | | Ins. hrs | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|----------------------|-------------|----------|--------|--|---------------|-----------|-------|
| | | Course Title | | /week | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 28 | III | Core Theory | Paper-5 | 4 | 4 | Inorganic Chemistry - I | 25 | 75 | 100 |
| | III | Core Practical | Practical-3 | 3 | 0 | Gravimetric Estimation | 0 | 0 | 0 |
| 29 | III | Core Theory | Paper-6 | 4 | 4 | Organic Chemistry – I | 25 | 75 | 100 |
| | III | Core Practical | Practical-4 | 3 | 0 | Organic Analysis and Preparations | 0 | 0 | 0 |
| 30 | III | Core Theory | Paper-7 | 4 | 4 | Physical Chemistry – I | 25 | 75 | 100 |
| | III | Core Practical | Practical-5 | 3 | 0 | Physical Chemistry | 0 | 0 | 0 |
| 31 | III | Elective | Paper-1 | 3 | 3 | Any one from A. Analytical chemistry – I B. Basis of computer programming in C and its applications in Chemistry C. Organic Synthesis | 25 | 75 | 100 |
| 32 | III | Elective | Paper - 2 | 3 | 3 | Any one from A. Pharmaceutical Chemistry B. Polymer Chemistry C. Green Chemistry | 25 | 75 | 100 |
| 33 | IV | Skill Based Subject | Paper - 3 | 3 | 3 | Applied chemistry | 25 | 75 | 100 |
| | | | | 30 | 21 | | 150 | 450 | 600 |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 34 | III | Core Theory | Paper-8 | 5 | 5 | Inorganic Chemistry – II | 25 | 75 | 100 |
| 35 | III | Core Practical | Practical-3 | 3 | 3 | Gravimetric Estimation | 25 | 75 | 100 |
| 36 | III | Core Theory | Paper-9 | 5 | 4 | Organic Chemistry – II | 25 | 75 | 100 |
| 37 | III | Core Practical | Practical-4 | 3 | 3 | Organic Analysis & Preparations | 25 | 75 | 100 |
| 38 | III | Core Theory | Paper-10 | 5 | 4 | Physical Chemistry – II | 25 | 75 | 100 |
| 39 | III | Core Practical | Practical-5 | 3 | 3 | Physical Chemistry Experiments | 25 | 75 | 100 |
| 40 | III | Elective | Paper-3 | 3 | 3 | Any one from A. Analytical chemistry - II B. Textile chemistry C. Nano Chemistry | 25 | 75 | 100 |
| 41 | IV | Skill based Subject | Paper-4 | 3 | 3 | Agriculture and Leather Chemistry | 25 | 75 | 100 |
| 42 | V | Extension Activities | | - | 1 | Extension Activities | 100 | 0 | 100 |
| | | TOTAL | | 30 | 29 | | 300 | 600 | 900 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|----------------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) * | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) * | 2 | 4 | 8 | 100 | 200 |
| | Allied Practical (Even Semester) | 2 | 2 | 4 | 100 | 200 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core (Theory & Practicals) | 15 | (3-6) | 57 | 100 | 1500 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 42 | | 140 | | 4200 |

*** Allied Mathematics:**

| | Ins. Hrs/Week | Credit | CIA | University | Total Marks |
|---------|---------------|--------|-----|------------|-------------|
| Paper-1 | 7 | 4 | 25 | 75 | 100 |
| Paper-2 | 7 | 6 | 25 | 75 | 100 |

if Mathematics is one of the Allied Subjects total no. of papers will be 41.

THIRUVALLUVAR UNIVERSITY

B.Sc., CHEMISTRY SYLLABUS UNDER CBCS

(With effect from 2017 - 2018)

SEMESTER I

PAPER – 1 GENERAL CHEMISTRY – I

Objective:

Basic concepts regarding Atomic Structure, Periodic Properties, Bonding Concepts, Ionic Bond, VSEPR and MO Theories, Nomenclature of Organic Compounds, Hybridisation, Reaction Intermediates, States of Matter, Principle of Volumetric Analysis, Related Problems and Applications wherever necessary are to be taught for I- Semester.

UNIT-I ATOMIC STRUCTURE

1.1 Quantum numbers n, l, m and s – Pauli's exclusion principle – Energy distribution and orbitals - Hund's rule of maximum multiplicity - Aufbau's principle - Electronic Configuration of elements - Stability of Half-filled and completely filled orbitals.

1.2 Classification of elements – General characteristics of s, p, d and f- Block elements – Periodicity of properties- Definition and Periodicity of the following properties – Atomic radii and Ionic radii - Factors affecting the Atomic radii and Ionic radii.

1.3 Ionisation potential, Electron affinity and Electronegativity - Factors affecting the Ionisation potential, Electron affinity and Electronegativity – Pauling scale – Mulliken electronegativity scale – Applications of Electronegativity regarding the Bonding nature.

UNIT- II CHEMICAL BONDING

2.1 Ionic bond - Conditions for the formation of ionic bond - General properties – Energetics of formation of NaCl from Na^+ and Cl^- - Hydration energy, Lattice energy and their applications – Born-Haber cycle - Fajan's rule - Characteristics of Electrovalent compounds.

2.2 Valence Bond Theory - Conditions for the formation of covalent bond - General properties - Polarity of bonds - Orbital overlap - Bond lengths and Bond energies - Hybridisation - Sigma and Pi bonds - VSEPR theory - Geometries of BF_3 , NH_3 , H_2O , PCl_5 and SF_6 molecules - Partial ionic character of covalent bond - Percentage of ionic character.

2.3 Molecular Orbital theory – Bonding and Anti-bonding orbitals - Relative order of Energies of molecular orbitals - MO diagram of H_2 , He_2 , O_2 , N_2 , F_2 and CO - Bond Order - Stability and Magnetic properties of the molecules - Comparison of VB and MO theories.

UNIT- III BASIC CONCEPTS OF ORGANIC CHEMISTRY

3.1 Classification of Organic Compounds – Nomenclature of Organic Compounds – Functional Groups - Homologous Series - IUPAC Recommendations for Naming Simple Aliphatic and Alicyclic Compounds.

3.2 Basic concepts of bonding in organic chemistry - Hybridisation – Definition – Geometry of Molecules - Methane, Ethane, Ethylene, Acetylene and Benzene - Electron displacement effects - Inductive - Inductomeric - Electromeric – Mesomeric Effect - Resonance - Hyperconjugation and Steric Effects.

3.3 Cleavage of bonds - Homolytic and Heterolytic fission of carbon-carbon bond – Methods to determine the Reaction Mechanism - Reaction intermediates - Structure and Stability of Carbocations, Carbanions and Free radicals.

UNIT-IV STATES OF MATTER

4.1 Gaseous state - Kinetic gas equation - Derivation - Gas laws from the kinetic gas equation - Kinds of velocities - Mean, RMS, Most Probable Velocities - Calculation of molecular velocities - Maxwell's distribution of Molecular Velocities (No derivation) - Effect of Temperature on velocity distribution - Equipartition of energy - Heat capacity on molecular basis - Virial equation of state - Boyle temperature - Coefficient of Compressibility and Thermal expansion.

4.2 Liquid state - Density – Diffusion - Viscosity – Evaporation - Surface tension - Effect of temperature on surface tension - Parachor - Definition and Applications only - Coefficient of Viscosity - Effect of Temperature and Pressure - Liquid crystals - Classification and Molecular arrangements.

4.3 Solid State - Crystal lattices - Laws of Crystallography - Symmetry elements in crystals - Seven crystal systems - Unit cell - Space lattice - Bravais lattices - Law of Rational Indices - Miller indices.

UNIT-V PRINCIPLES OF VOLUMETRIC ANALYSIS

5.1 Definitions of Molarity, Molality, Normality and Mole Fraction - Their Calculations - Definition and Examples for Primary and Secondary standards - Calculation of Equivalent Weight of Acid, Base, Oxidising Agent, Reducing Agent and Salts.

5.2 Principles of Volumetric Analysis - Theories of Acid- Base, Redox, Complexometric Iodometric and Iodimetric titrations.

5.3 Theories of indicators - Acid-base indicators - Choice of indicators - Redox, Metal ion and Adsorption indicators.

ALLIED

1. PHYSICS - I

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak,Cambridge,University Press(1999).

ALLIED

3. ZOOLOGY I

Objective:

To acquire knowledge about different kinds of animal species.

To study the systematic and functional morphology of invertebrates and chordates.

UNIT – I:

Type study includes life history.

Protozoa - Entamoeba, **Porifera** - Sycon. **Coelenterata** - Obelia geniculata.
Platyhelminthes - Teania solium.

UNIT - II

Annelida - Earthworm, **Arthropoda** - Prawn, **Mollusca** - Fresh water mussel,
Echinodermata - Sea star.

UNIT – III:

Type study includes Morphology, digestive system, respiratory system, circulatory system and urinogenital system of Chordate.

Chordata - General characters, **Prochordata:** Morphology of Amphioxus.
Vertebrates: Pisces - Shark.

UNIT - IV

Amphibia: Frog, **Reptiles:** Calotes

UNIT - V

Aves: Pigeon, **Mammalia:** Rabbit.

REFERENCES:

1. Ayyar, E.K. and T.N. Ananthakrishnan. 1992. Manual of Zoology. Vol I & II, S. Viswanathan (printers and publishers) Pvt. Ltd., Madras, 891 p.
2. Kotpal series, 1998 - 1992. Rastogi Publications, Meerut.
3. Jordan E.L. and P.S. Verma. 1993. Invertebrate Zoology 12th edition, S. Chand & Co., Ltd., New Delhi.
4. Jordan, E.L., and P.S. Verma. 1995. Chordate Zoology and Elements of Animal Physiology, S. Chand & Co., Ltd., New Delhi.

4. BIOCHEMISTRY I

UNIT-I: Chemistry of Carbohydrates

Definition and Classification of carbohydrate. Monosaccharides - occurrence, structure; physical and chemical properties, linear and ring forms (Haworth formula) for glucose and fructose. Disaccharides - occurrence, structure; physical and chemical properties of sucrose and lactose. Polysaccharides - occurrence, structure, physical and chemical properties of starch.

UNIT-II: Chemistry of amino acids

Definition and classification of amino acids. Reaction with ninhydrin, common properties of amino acids, amphoteric nature, isoelectric point, isoelectric pH and Zwitter ion.

UNIT-III: Chemistry of Proteins

Classification based on solubility, shape and size. Physical properties: salting in and salting out, denaturation, peptide bond. Structure of protein: primary, secondary, tertiary and quaternary structure.

UNIT-IV: Chemistry of Lipids

Definition, classification and functions of lipids. Occurrence, chemistry and biological functions of simple lipids, compound lipids (e.g. phospholipids) and derived lipids: steroids (e.g. cholesterol). Physical property-emulsification. Chemical property-saponification. Functions of bile acids and bile salts.

UNIT-V: Chemistry of Nucleic acids

Definition - nucleoside, nucleotide and polynucleotide. Double helical model of DNA and its biological functions. Structure, types and functions of RNA: tRNA, mRNA and rRNA. Differences between DNA and RNA.

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Rober K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan , MJP Publishers, Chennai - 5.

5. MATHEMATICS – I*

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots- Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians -Concepts of polar co-ordinates-Curvature and radius of curvature in Cartesian co-ordinates and in polar co-ordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
3. P.R.Vittal (2003) *Allied Mathematics* .Marghan Publications, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics Vol-I, II* S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai.

SEMESTER II
PAPER – 2
GENERAL CHEMISTRY - II

OBJECTIVES:

- Basic knowledge on s- and p- Block Elements, Group Study, Hydrocarbons, Cycloalkanes, Dienes, Quantum Chemistry, Thermochemistry, First Law of Thermodynamics, Derivation of Equations, Related Problems, Reaction Mechanism and Applications wherever necessary are to be taught for II- Semester.

UNIT-I s- and p- Block Elements

1.1 Alkali metals - Li, Na, K, Rb and Cs - Occurrence - Comparative study of Elements with respect to Oxides, Halides, Hydroxides and Carbonates - Exceptional property of Lithium - Diagonal Relationship of Li with Mg.

1.2 Alkaline earth metals - Be, Mg, Ca, Sr and Ba - Occurrence - Comparative study of the elements with respect to Oxides, Hydroxides, Halides, Sulphates and Carbonates - Exceptional property of Beryllium - Diagonal relationship of Be with Al - Comparison of Alkaline Earth Metals with Alkali Metals - Magnesium acting as bridge element between II A and II B groups - Magnesium resembles Zinc.

1.3 p- Block elements - Boron family - Group discussion - Anomalous behaviour of Boron - Diagonal Relationship between Boron and Silicon - Electron deficiency and Electron acceptor behaviour of Boron trihalides - Bonding in Diborane (Hydrogen-bridge structure) - Preparation, Properties, structure and Uses of Borazine - NaBH_4 - Preparation and Uses.

UNIT-II HYDROCARBONS

2.1 Alkanes - Methods of preparation of alkanes - Wurtz method, Kolbe's method and Reduction of alkyl halides - Physical and Chemical Properties of alkanes - Mechanism of Free Radical Substitution in alkanes – Halogenation and Reactivity.

2.2 Alkenes - Properties of alkenes – Electrophilic and Free radical addition - Addition reactions of Alkenes with mechanism - Addition of Hydrogen, Halogens, Hydrogen Halide (Markownikoff's rule) - Hydrogen bromide (Peroxide effect) - Sulphuric Acid, Water, BH_3 , Ozonolysis, Hydroxylation with KMnO_4 - Allylic substitution by NBS.

2.3 Alkynes - Acidity of alkynes - Addition of hydrogen - Hydroboration - Hydrohalogenation - Addition of hypohalous acid, Hydration - Addition of water with HgSO_4 catalyst - Oxidation with KMnO_4 – Ozonolysis - Formation of Acetylides.

UNIT-III DIENES AND CYCLOALKANES

3.1 Dienes – Classification - Conjugated, Isolated and Cumulative Dienes - Stability of Dienes - 1, 2- and 1, 4- Addition reactions of H_2 and HX with mechanisms – Synthesis of dienes – 1, 3 - Butadiene, Isoprene and Chloroprene - Diels-Alder reaction.

3.2 Cycloalkanes - Preparation using Wurtz's reaction, Dieckmann's ring closure and Reduction of aromatic hydrocarbons - Substitution and Ring opening reactions.

3.3 Stability of Alkanes, Alkenes and Cycloalkanes - Bayer's strain theory - Theory of Strainless rings.

UNIT-IV QUANTUM CHEMISTRY AND THERMOCHEMISTRY

4.1 Planck's Quantum theory of radiation - Photoelectric Effect - Compton Effect - Wave mechanical concept of the atom - de Broglie's relationship – Davisson and Germer experiment - Wave nature of electron - Heisenberg's Uncertainty Principle.

4.2 Schrodinger wave equation (Without derivation) - Significance of wave functions ψ and ψ^2 - Shapes of s, p and d- orbitals.

4.3 Thermodynamics - Definition and Explanation of terms - System, Boundary, Surroundings - Homogeneous and Heterogeneous systems - Isolated system - Closed system - Open system - Intensive and Extensive properties - State of a system - Independent state variables - Dependent state variables - Thermodynamic functions - State and Path functions.

UNIT-V THERMODYNAMICS

5.1 Thermodynamic processes - Types of processes - Cyclic - Reversible – Irreversible - Isothermal – Adiabatic Process - Exact and Inexact Differentials - Concept of Heat and Work - Zeroth Law of Thermodynamics.

5.2 First law of Thermodynamics - Statement and Equation – C_p and C_v Relationship - Calculation of W , Q , ΔE and ΔH for the Expansion of Ideal Gases under Reversible, Isothermal and Adiabatic Conditions.

5.3 Thermochemistry - Heat of a reaction - Exothermic and Endothermic reactions - Calculation of ΔH from ΔE and vice versa - Thermochemical equations - Bond dissociation energy - Calculation from thermochemical data - Variation of Heat of a reaction with temperature - Kirchoff's Equation and Its significance.

CORE PRACTICAL
Paper – 1
VOLUMETRIC ANALYSIS

Acidimetry

1. Estimation of Borax - Standard Sodium Carbonate
2. Estimation of Sodium Hydroxide - Standard Sodium Carbonate
3. Estimation of HCl – Standard Oxalic Acid.

Iodometry

4. Estimation of Copper - Standard Copper Sulphate
5. Estimation of Potassium Dichromate - Standard Potassium Dichromate

Complexometry

6. Estimation of Magnesium using EDTA.
7. Estimation of Zinc using EDTA

Dichrometry

8. Estimation of Ferrous Iron using Diphenyl amine / N- pPhenylanthranillic acid as indicator.

Precipitation titration

9. Estimation of Chloride in neutral medium (Demonstration experiment).

Permanganometry

10. Estimation of Ferrous Sulphate – Standard FAS.
11. Estimation of Oxalic Acid – Standard Oxalic Acid.

- Students must write Short Procedure for the given estimation in Ten Minutes during the examination and submit the Paper for Evaluation.

ALLIED – 2

1. PHYSICS II

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davission and Germer's Experiment – G.P. Thomson's Experiment _ Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell –Bravais lattice- structures of simple cubic-BCC and FCC- co ordination number, packing factor calculation for the above structures –Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology– limitations.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
9. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
10. Renewable & Sustainable energy sources – Agarwal.

3. ZOOLOGY II

Objective:

To study the principles of cell biology, genetics, developmental biology, physiology, ecology and evolution.

UNIT - I

Cell Biology - structure of animal cell, **Genetics:** molecular structure of gene - gene function, sex linked inheritance. Genetic Engineering and its application.

UNIT - II

Embryology - cleavage and gastrulation of Amphioxus.

Human Physiology: Digestion, Circulation - blood components, structure of heart, heart function.

UNIT - III

Diseases of Circulatory system - blood pressure, heart disease - Ischemia, Myocardial Infarction, Rheumatic heart disease, stroke.

Excretion - structure of kidney and mechanism of urine formation.

UNIT - IV

Environmental Biology - Biotic factors and Abiotic factors, food chain and food web. Pollution - Environmental degradation, (Air, Water and Land) - Green house effect - Bioremediation, Biodegradation - Global warming - acid rain.

UNIT - V

Evolution: Theories of Lamarkism & Darwinism.

REFERENCES:

1. Ekambaranatha Ayyar, and Ananthakrishnan, T.N. 1993. Outlines of Zoology, Vol I & II, Viswanathan and Co, Madras.
2. Sambasiviah, I, Kamalakara Rao, A.P., Augustine Chellappa, S. 1983. Text book of Animal Physiology, S. Chand & Co., New Delhi.
3. Verma and Agarwal. 1983. Text book of animal Ecology, S. Chand & Co., New Delhi.
4. Verma and Agarwal and Tyagi. 1991. Chordate Embryology, S. Chand & Co., New Delhi.
5. Rastogi and Jayaraj. 2000. Text book of Genetics. Rastogi publications, Meerut.
6. Verma and Agarwal. 2000. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand & Co., New Delhi.

4. BIOCHEMISTRY II

UNIT-I: Metabolism

Glycolysis, TCA cycle and its energetics, HMP shunt pathway. Deamination, transamination reaction, transaminase enzymes, Urea cycle.

UNIT-II: Metabolic Disorders

Diabetes mellitus, Glycogen storage diseases, Glycosuria, Ketosis, Jaundice, Phenyl ketonuria, Alkaptonuria. Dehydration: definition, causes, symptom and prevention.

UNIT-III: Enzymes

Definition, classification of enzymes with one example. Mechanism of enzyme action - Lock and key mechanism, Induced Fit theory. Michaleis-Menton equation. Enzyme inhibition: competitive, uncompetitive and non competitive. Biological functions of enzymes.

UNIT-IV: Molecular Biology

Central dogma of molecular biology. DNA and RNA act as genetic material. Replication: Definition, types, mode of action of replication, mechanism of replication. General mechanism of transcription and translation. Genetic code.

UNIT-V: Vitamins

A brief outline of source, requirement, biological function and deficiency of Vitamins (fat soluble and water soluble vitamins).

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Robert K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan, MJP Publishers, Chennai-5.

5. MATHEMATICS – II*

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume -Fourier series for functions in $(0,2\pi)$ and $(-\pi, \pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Gauss, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
3. P.R.Vittal(2003). *Allied Mathematics* .Marghan Publications, Chennai.
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai

ALLIED PRACTICAL

1. PHYSICS

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Ridigity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
8. Sonometer – frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer Grating – Minimum Deviation – Mercury Lines.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT by transistors.
18. Zener diode – Voltage Regulation.
19. NAND / NOR as universal gate.
20. Demorgan's theorem verification.

3. ZOOLOGY

I - MAJOR PRACTICAL

DISSECTIONS

Cockroach: Digestive and nervous system

Prawn: Nervous system

II - MINOR PRACTICAL

MOUNTING

1. Mouth parts of **Mosquito** and **Honey bee**
2. **Earthworm** - Body setae
3. Placoid scales of **shark**

III - SPOTTERS

Entamoeba, Sycon, Obelia, Taenia solium (entire, scolex) earthworm (entire, Pineal setae) Prawn (entire), Fresh water mussel, Sea star, Amphioxus - Entire, Amphioxus - T.S. through pharynx, Shark, Frog, Calotes, Pigeon, feathers of pigeon and Rabbit.

Sphygmomanometer, Stethoscope, Rain gauge.

REFERENCES:

1. Verma. P.S. 2011. A manual of practical Zoology - INVERTEBRATES. Chand & Co., Ltd., Ram Nagar, New Delhi.
2. Verma. P.S. 2011. A manual of practical Zoology - CHORDATES. Chand & Co., Ltd., Ram Nagar, New Delhi.

ALLIED PRACTICAL

4. BIOCHEMISTRY I & II

PRACTICAL I

Volumetric Estimation

1. Estimation of HCl using Na_2CO_3 as link and NaOH as primary standard.
2. Estimation of Iron in Ferrous Ammonium Sulphate using potassium permanganate as link solution and oxalic acid as primary standard.
3. Estimation of Glucose by Benedict's method.
4. Estimation of Glycine by formal titration.
5. Estimation of Ascorbic acid.

SEMESTER – III

PAPER – 3

GENERAL CHEMISTRY – III

OBJECTIVE:

Basic concepts regarding the Principles of Inorganic Analysis and Applications of Qualitative Analysis, Types of Solvents, p- Block Elements, Group Study, Aromaticity, Electrophilic and Nucleophilic Substitution Reactions, Elimination Reactions, Reaction Mechanism, Second Law of Thermodynamics, Derivation of Equations, Related Problems and Applications wherever necessary are to be taught for III semester.

UNIT-I

1.1 Semimicro Techniques - Principles of Acid-Base Equilibria - Common ion effect - Solubility Product and its Applications in Qualitative Analysis - Principles of Inorganic Analysis.

1.2 Reactions involved in the Separation and Identification of Cations and Anions in Qualitative analysis - Spot test reagents - Aluminon, Cupferon, DMG, Thiourea, Magneson, Alizarin and Nessler's reagent.

1.3 Types of solvents - Protic and Aprotic solvents - Amphiprotic / Amphoteric solvents - Aqueous and Non-aqueous solvents - Liquid Ammonia as a solvent.

UNIT-II

2.1 Carbon family – Group study - Comparative study of Elements with respect to Valency, Oxides, Halides, Hydrides and Oxyacids - Catenation - Comparison of Properties of Carbon and Silicon – Silicates - Classification and Structure - Silicones- Preparation, Properties and Uses.

2.2 Nitrogen family - Group study - Comparative study of N, P, As, Sb and Bi with respect to Oxides, Oxyacids, Halides and Hydrides – Hydrazine and Hydroxylamine - Preparation, Properties, Structure and Uses.

2.3 Oxygen family - Group study - Comparative study of O, S, Se and Te with respect to Catenation, Oxides, Halides, Hydrides and Oxyacids - Anomalous Behaviour of Oxygen - Oxyacids of Sulphur (Structure only) - Peracids of Sulphur - Preparation, Properties and Structure - Differences Between Permonosulphuric Acid and Perdisulphuric Acid.

UNIT-III

3.1 Aromaticity - Modern Theory of Aromaticity - Huckel's ($4n + 2$) Rule and Its Simple Applications to Benzenoid and Non- benzenoid Compounds.

3.2 Electrophilic substitution reactions in Aromatic Compounds - Mechanisms of Nitration, Halogenations, Sulphonation, Friedel-Crafts Acylation and Alkylation.

3.3 Directive influence - Orientation - Ortho/Para ratio - Nuclear and Side chain Halogenation.

UNIT-IV

4.1 Aliphatic Nucleophilic Substitutions - Mechanisms of S_N1 , S_N2 and S_Ni Reactions – Effect of Structure of Substrate, Solvent, Nucleophile and Leaving Group.

4.2 Elimination reactions - Mechanism of E1 and E2 reactions - Hoffmann and Saytzeff's rules - Cis and Trans Eliminations.

4.3 Aromatic Nucleophilic Substitutions - Unimolecular Nucleophilic Substitution, Bimolecular Nucleophilic Substitution and their Mechanism.

UNIT-V

5.1 Second Law of Thermodynamics - Need for the II Law of Thermodynamics - Spontaneous Process – Criteria of Spontaneity - Different Forms of Statements of the Second Law – Cyclic Process – Definition - Heat Engines.

5.2 Carnot's cycle - Efficiency - Carnot's theorem (Statement only) - Concept of Entropy - Definition and Mathematical Statement - Randomness and Entropy – Standard Entropy - Derivation of Entropy from Carnot Cycle.

5.3 Entropy change of an Ideal Gas during Isothermal Process - Entropy changes in Cyclic, Reversible and Irreversible Processes - Entropy Changes in Physical Transformations - Calculation of Entropy Changes with Changes in T, V and P - Entropy of Mixing of Ideal Gases – Physical Significance of Entropy.

ALLIED

1. PHYSICS - I

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

9. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
10. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
11. Allied Physics – Prof. Dhanalakshmi and others.
12. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
13. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
14. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
15. Modern Physics – R. Murugesan S. Chand & Co. (2004).
16. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak, Cambridge, University Press (1999).

ALLIED
3.ZOOLOGY I

Objective:

To acquire knowledge about different kinds of animal species.

To study the systematic and functional morphology of invertebrates and chordates.

UNIT – I:

Type study includes life history.

Protozoa - Entamoeba, **Porifera** - Sycon. **Coelenterata** - Obelia geniculata.
Platyhelminthes - Teania solium.

UNIT - II

Annelida - Earthworm, **Arthropoda** - Prawn, **Mollusca** - Fresh water mussel,
Echinodermata - Sea star.

UNIT – III:

Type study includes Morphology, digestive system, respiratory system, circulatory system and urinogenital system of Chordate.

Chordata - General characters, **Prochordata:** Morphology of Amphioxus.
Vertebrates: Pisces - Shark.

UNIT - IV

Amphibia: Frog, **Reptiles:** Calotes

UNIT - V

Aves: Pigeon, **Mammalia:** Rabbit.

REFERENCES:

1. Ayyar, E.K. and T.N. Ananthakrishnan. 1992. Manual of Zoology. Vol I & II, S. Viswanathan (printers and publishers) Pvt. Ltd., Madras, 891 p.
2. Kotpal series, 1998 - 1992. Rastogi Publications, Meerut.
3. Jordan E.L. and P.S. Verma. 1993. Invertebrate Zoology 12th edition, S. Chand & Co., Ltd., New Delhi.
4. Jordan, E.L., and P.S. Verma. 1995. Chordate Zoology and Elements of Animal Physiology, S. Chand & Co., Ltd., New Delhi.

4. BIOCHEMISTRY I

UNIT-I: Chemistry of Carbohydrates

Definition and Classification of carbohydrate. Monosaccharides - occurrence, structure; physical and chemical properties, linear and ring forms (Haworth formula) for glucose and fructose. Disaccharides - occurrence, structure; physical and chemical properties of sucrose and lactose. Polysaccharides - occurrence, structure, physical and chemical properties of starch.

UNIT-II: Chemistry of amino acids

Definition and classification of amino acids. Reaction with ninhydrin, common properties of amino acids, amphoteric nature, isoelectric point, isoelectric pH and Zwitter ion.

UNIT-III: Chemistry of Proteins

Classification based on solubility, shape and size. Physical properties: salting in and salting out, denaturation, peptide bond. Structure of protein: primary, secondary, tertiary and quaternary structure.

UNIT-IV: Chemistry of Lipids

Definition, classification and functions of lipids. Occurrence, chemistry and biological functions of simple lipids, compound lipids (e.g. phospholipids) and derived lipids: steroids (e.g. cholesterol). Physical property-emulsification. Chemical property-saponification. Functions of bile acids and bile salts.

UNIT-V: Chemistry of Nucleic acids

Definition - nucleoside, nucleotide and polynucleotide. Double helical model of DNA and its biological functions. Structure, types and functions of RNA: tRNA, mRNA and rRNA. Differences between DNA and RNA.

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Rober K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan , MJP Publishers, Chennai - 5.

5.MATHEMATICS – I*

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots- Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians -Concepts of polar co-ordinates-Curvature and radius of curvature in Cartesian co-ordinates and in polar co-ordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

6. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
7. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
8. P.R.Vittal (2003) *Allied Mathematics* .Marghan Publications, Chennai
9. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
10. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai.

SKILL BASED SUBJECT
PAPER – 1
WATER TREATMENT AND ANALYSIS

Objective:

- To impart knowledge about the various methods of Water Analysis and Treatment of Water.

UNIT-I

1.1 Introduction - Characteristics of water - Alkalinity - Hardness - Unit of hardness – Total solids - Oxidation - Transparency - Silica content.

1.2 Purification of Water for drinking purpose - Potability of water – Clarification - Coagulation - Contact and Electrochemical Coagulation.

1.3 Sterilisation and Disinfection of water - Precipitation - Aeration - Ozonisation - Chlorination.

UNIT-II

2.1 Water Softening Methods - Clark's process - Lime soda process - Modified lime soda process - Permutit or Zeolite process - Ion exchange process - Demineralisation of water.

2.2 Determination of Hardness of water - Titration method - Complexometric method using EDTA - Expressing Hardness.

2.3 Equivalents of Calcium Carbonate - Problems to determine Temporary and Permanent Hardness.

UNIT-III

3.1 Hard water and Industries - Industrial water treatment - Boiler feed water method of Softening - Prevention of plumbo solvency - Scales in boilers - Consequences - Internal conditioning methods.

3.2 Desalination of Brackish water - Electrodialysis - Reverse osmosis - Removal of Fe, Mn and Silicic acid.

3.3 Effluent Treatment of Water from Paper Industry, Petrochemicals, Fertilizer industry and Power station.

UNIT-IV

4.1 Water analysis - Sampling of Water for analysis - Chemical Substances affecting Potability - Colour, Turbidity, Odour, Taste, Temperature, pH and Electrical Conductivity.

4.2 Analysis of Solids present in water - Suspended Solids - Dissolved Solids - Total Acidity - Alkalinity - Free CO₂ - Free Chlorine - Ca, Mg, Fe, Mn, Ag and Zn.

4.3 Water in Industry – Pollution of Water by Fertilisers, Detergents, Pesticides and Industrial wastes.

UNIT-V

5.1 Analysis of Chemical Substances Affecting Health - NH₃, Nitrate, Nitrite, Cyanide, Sulphate, Sulphide, Chloride and Fluoride.

5.2 Measurement of Toxic Chemical Substances - Analysis of Chemical Substances indicative of Pollution - Dissolved oxygen - Biochemical Oxygen Demand (BOD) - Chemical Oxygen Demand (COD)

5.3 Bacteriological Examination of Water - Total Count Test - E. coli test - E. coli index - Most Probable Number method - Biological Examination of Water - Physical Examination of Water - Radioactivity of Water - Methods of removing Radioactivity from Water.

Reference Books

1. Industrial Chemistry (Including Chemical - Engineering) - B. K. Sharma - Goel Publishing House, Meerut (1987).
2. Pollution Control in Process Industries - S. P. Mahajan - Tata McGraw Hill Publishing Company Ltd., New Delhi (1991).
3. Water Pollution and Management - C. K. Varashney - Wiley Eastern Ltd., Chennai -20 (1991).

NON-MAJOR ELECTIVE

PAPER – 1

MEDICINAL CHEMISTRY

Objectives:

- To learn the basic idea of Drugs and Names of Common Drugs, Blood, Blood Pressure, Diabetes, AIDS, Vitamins, Indian Medicinal Plants and First Aid.

UNIT-I

1.1 Clinical Health and Biochemical Analysis - Definition of Health - WHO standard.

1.2 Sterilisation of Surgical Instruments - Biochemical Analysis of Urine and Serum.

1.3 Blood – Composition of Blood - Blood grouping and Rh factor.

UNIT-II

2.1 Common Drugs - Antibiotics, Antipyretics and Analgesics - Examples, Uses and Side effects.

2.2 Anti-inflammatory agents, Sedatives, Antiseptics and Antihistamines - Examples, Uses and Side effects.

2.3 Tranquilizers, Hypnotics and Antidepressant drugs - Definition, Examples, Uses and Side effects.

UNIT-III

3.1 Vital Ailments and Treatment - Blood pressure - Hypertension and Hypotension.

3.2 Diabetes, Cancer, AIDS - Causes, Symptoms and Treatment.

3.3 Vitamins – Classification of Vitamins – Sources and Deficiency diseases caused by Vitamins.

UNIT-IV

4.1 Indian Medicinal Plants - Palak, Vallarai, Kizhanelli and Thumbai - Chemical Constituents and Medicinal Uses.

4.2 Hibiscus, Adadodai, Thoothuvalai – Chemical Constituents and Medicinal Uses.

4.3 Nochi, Thulasi, Aloe Vera - Chemical Constituents and Medicinal Uses.

UNIT- V

5.1 First Aid and Safety - Treatment of Shock, Haemorrhage, Cuts and Wounds.

5.2 Burns - Classification - First Aid.

5.3 Asbestos, Silica, Lead Paints, Cement, Welding fumes and Gases - Hazard alert and Precautions for Safety.

Reference Books

1. Applied Chemistry, Jayashree Ghosh - S. Chand and Company Ltd., 2006
2. Biochemistry, S. C. Rastogi - Tata McGraw Hill Publishing Co., 1993.
3. Medicinal Plants of India, Rasheeduz Zafar - CBS Publishers and Distributors, 2000.
4. Hawk's Physiological Chemistry, B. L. Oser - Tata-McGraw Hill Publishing Co. Ltd.
5. Practical Pharmaceutical Chemistry, A. H. Beckett and J. B. Stenlake - Vol. I - CBS Publishers and Distributors, 2000.

SEMESTER – IV
PAPER – 4
GENERAL CHEMISTRY – IV

OBJECTIVE:

Noble gases, Carboxylic Acids, Amines, Alcohols, Phenols, Naphthols, Important Name Reactions, Mechanism, Thermodynamics, Derivation of Equations, Partial Molar Properties, Chemical Potential, Related Problems and Applications are to be taught for IV semester.

UNIT-I

1.1 Noble gases - Electronic Configurations – Position of Noble Gases in the Periodic Table - Chemical inertness of Noble gases – Reason.

1.2 Compounds of Xenon - Hybridization and Geometry of XeF_2 , XeF_4 , XeF_6 and XeOF_4 (Preparation, Properties – Not necessary).

1.3 Clathrates - Definition and Applications - Uses of Noble gases.

UNIT-II

2.1 Monocarboxylic acids – Acetic acid and Benzoic acid – Preparation by Grignard method – Conversion of Acids to their derivatives – Amide, Ester, Anhydride and Acid Chloride – Strength of Carboxylic Acids – Effect of Substituents on the Strength of Acids.

2.2 Dicarboxylic acids – Oxalic acid, Malonic acid, Succinic acid, Glutaric acid and Adipic acid - Preparation – Properties – Action of Heat on Dicarboxylic acids.

2.3 Amines – Ethylamine and Aniline – Preparation – Basicity of Amines – Effect of Substituents on Basicity - Reactivity of Amines – Distinction between Primary, Secondary and Tertiary Amines.

UNIT-III

3.1 Alcohols – Preparation by Grignard method – Oxidation of alcohols – Difference between Primary, Secondary and Tertiary alcohols – Preparation and Properties of Allyl alcohol.

3.2 Phenols - Acidic character of phenols - Kolbe's reaction, Reimer-Tiemann reaction, Gattermann , Lederer-Manasse, Houben-Hoesh, Friedel-Crafts, Schotten-Baumann and Liebermann's Nitroso Reaction.

3.3 Preparation, Properties and Uses of Alpha- and Beta- Naphthols.

UNIT-IV

4.1 Free energy and Work function - Gibbs free energy – Helmholtz free energy – Relationship between Gibbs free energy and Helmholtz free energy – Their variations with Temperature, Pressure and Volume – Free energy change as criteria for Equilibrium and Spontaneity.

4.2 Maxwell's Relations – Thermodynamic Equation of State.

4.3 Gibbs-Helmholtz equation - Derivation and Applications - Clausius-Clapeyron equation - Derivation and Applications.

UNIT-V

5.1 Third Law of Thermodynamics - Entropy at Absolute Zero - Nernst Heat Theorem – Statement of III law of thermodynamics – Planck's formulation of III law of thermodynamics.

5.2 Evaluation of Absolute Entropy from Heat Capacity Measurements - Exceptions to III law – Applications of III law.

5.3 Partial molar properties - Chemical Potential – Definition - Effect of Temperature and Pressure on Chemical Potential - Gibbs-Duhem equation.

CORE PRACTICAL

PAPER – 2

INORGANIC QUALITATIVE ANALYSIS AND PREPARATION

Analysis of mixture containing two cations and two anions (One will be an interfering anion). Semimicro methods using the conventional scheme are to be adopted.

Cations to be studied

Lead, Copper, Bismuth, Cadmium, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.

Anions to be studied

Carbonate, Sulphide, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

Preparation of Inorganic compounds

- Tetraamminecopper(II) Sulphate
- Tris(thiourea)copper(I) Chloride
- Potassium trioxalatoferrate(II)
- Ferrous Ammonium Sulphate
- Microcosmic Salt
- Manganese(II) Sulphate

References

- Vogel's Text Book of Quantitative Chemical Analysis, 5th Edition, ELBS/ Longman, England, 1989.
- Inorganic Semimicro Qualitative Analysis, V. V. Ramanujam.

ALLIED – 4

1.PHYSICS II

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davission and Germer's Experiment – G.P. Thomson's Experiment _ Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell –Bravais lattice- structures of simple cubic-BCC and FCC- co ordination number, packing factor calculation for the above structures –Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology– limitations.

Books for Study & Reference

11. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
12. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
13. Allied Physics – Prof. Dhanalakshmi and others.
14. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
15. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
16. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
17. Modern Physics – R. Murugesan S. Chand & Co. (2004).
18. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
19. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
20. Renewable & Sustainable energy sources – Agarwal.

3. ZOOLOGY II

Objective:

To study the principles of cell biology, genetics, developmental biology, physiology, ecology and evolution.

UNIT - I

Cell Biology - structure of animal cell, **Genetics:** molecular structure of gene - gene function, sex linked inheritance. Genetic Engineering and its application.

UNIT - II

Embryology - cleavage and gastrulation of *Amphioxus*.

Human Physiology: Digestion, Circulation - blood components, structure of heart, heart function.

UNIT - III

Diseases of Circulatory system - blood pressure, heart disease - Ischemia, Myocardial Infarction, Rheumatic heart disease, stroke.

Excretion - structure of kidney and mechanism of urine formation.

UNIT - IV

Environmental Biology - Biotic factors and Abiotic factors, food chain and food web. Pollution - Environmental degradation, (Air, Water and Land) - Green house effect - Bioremediation, Biodegradation - Global warming - acid rain.

UNIT - V

Evolution: Theories of Lamarckism & Darwinism.

REFERENCES:

7. Ekambaranatha Ayyar, and Ananthakrishnan, T.N. 1993. Outlines of Zoology, Vol I & II, Viswanathan and Co, Madras.
8. Sambasiviah, I, Kamalakara Rao, A.P., Augustine Chellappa, S. 1983. Text book of Animal Physiology, S. Chand & Co., New Delhi.
9. Verma and Agarwal. 1983. Text book of animal Ecology, S. Chand & Co., New Delhi.
10. Verma and Agarwal and Tyagi. 1991. Chordate Embryology, S. Chand & Co., New Delhi.
11. Rastogi and Jayaraj. 2000. Text book of Genetics. Rastogi publications, Meerut.
12. Verma and Agarwal. 2000. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand & Co., New Delhi.

4.BIOCHEMISTRY II

UNIT-I: Metabolism

Glycolysis, TCA cycle and its energetics, HMP shunt pathway. Deamination, transamination reaction, transaminase enzymes, Urea cycle.

UNIT-II: Metabolic Disorders

Diabetes mellitus, Glycogen storage diseases, Glycosuria, Ketosis, Jaundice, Phenyl ketonuria, Alkaptonuria. Dehydration: definition, causes, symptom and prevention.

UNIT-III: Enzymes

Definition, classification of enzymes with one example. Mechanism of enzyme action - Lock and key mechanism, Induced Fit theory. Michaleis-Menton equation. Enzyme inhibition: competitive, uncompetitive and non competitive. Biological functions of enzymes.

UNIT-IV: Molecular Biology

Central dogma of molecular biology. DNA and RNA act as genetic material. Replication: Definition, types, mode of action of replication, mechanism of replication. General mechanism of transcription and translation. Genetic code.

UNIT-V: Vitamins

A brief outline of source, requirement, biological function and deficiency of Vitamins (fat soluble and water soluble vitamins).

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Robert K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan, MJP Publishers, Chennai-5.

5.MATHEMATICS – II*

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume -Fourier series for functions in $(0,2\pi)$ and $(-\pi, \pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Gauss, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

6. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
7. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
8. P.R.Vittal(2003). *Allied Mathematics* .Marghan Publications, Chennai.
9. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
10. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai

ALLIED PRACTICAL - 2

1.PHYSICS

(Any 15 Experiments)

21. Young's modulus – non uniform bending – pin and microscope.
22. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
23. Rigidity modulus – Torsional oscillation method (without symmetric masses).
24. Determination of Co-efficient of Viscosity – Graduated Burette.
25. Surface Tension and Interfacial Tension – By drop weight method.
26. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
27. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
28. Sonometer – frequency of tuning fork.
29. Newton's Rings – Radius of Curvature.
30. Air Wedge – Determination of thickness of thin wire.
31. Spectrometer Grating – Minimum Deviation – Mercury Lines.
32. Spectrometer – Refractive Index of a liquid – Hollow Prism.
33. Potentiometer – Calibration of High Range Ammeter.
34. Potentiometer – Calibration of Low Range Voltmeter.
35. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
36. Figure of merit and voltage sensitiveness of table galvanometer.
37. Construction of AND, OR gates using diodes and NOT by transistors.
38. Zener diode – Voltage Regulation.
39. NAND / NOR as universal gate.
40. Demorgan's theorem verification.

Allied Practical

3. ZOOLOGY

I - MAJOR PRACTICAL

DISSECTIONS

Cockroach: Digestive and nervous system

Prawn: Nervous system

II - MINOR PRACTICAL

MOUNTING

1. Mouth parts of **Mosquito** and **Honey bee**

2. **Earthworm** - Body setae

3. Placoid scales of **shark**

III - SPOTTERS

Entamoeba, Sycon, Obelia, Taenia solium (entire, scolex) earthworm (entire, Pineal setae) Prawn (entire), Fresh water mussel, Sea star, Amphioxus - Entire, Amphioxus - T.S. through pharynx, Shark, Frog, Calotes, Pigeon, feathers of pigeon and Rabbit.

Sphygmomanometer, Stethoscope, Rain gauge.

REFERENCES:

3. Verma. P.S. 2011. A manual of practical Zoology - INVERTEBRATES. Chand & Co., Ltd., Ram Nagar, New Delhi.
4. Verma. P.S. 2011. A manual of practical Zoology - CHORDATES. Chand & Co., Ltd., Ram Nagar, New Delhi.

ALLIED PRACTICAL

4. BIOCHEMISTRY I & II

PRACTICAL I

Volumetric Estimation

1. Estimation of HCl using Na_2CO_3 as link and NaOH as primary standard.
2. Estimation of Iron in Ferrous Ammonium Sulphate using potassium permanganate as link solution and oxalic acid as primary standard.
3. Estimation of Glucose by Benedict's method.
4. Estimation of Glycine by formal titration.
5. Estimation of Ascorbic acid.

SKILL BASED SUBJECT

PAPER – 2

FOOD CHEMISTRY

Objective:

- To impart knowledge about Different Foods, Their Nutritive Values and Food Preservation.

UNIT-I

1.1 Cereals - Definition – Classification - Processing - Structure of Cereals - Composition and Nutritive value – Pulses - Definition - Classification - Processing - Structure of Pulses - Composition and Nutritive Value - Toxic Constituents in Pulses - Medicinal value of Cereals and Pulses.

1.2 Sugar - Structure and Properties - Nutritive value - Sugar composition in different food items.

1.3 Sugar related products - Classification and Nutritive value - Artificial sweeteners – Examples – Saccharin and Cyclamate - Advantages and Disadvantages.

UNIT-II

2.1 Vegetables and Fruits - Classification - Composition and Nutritive values.

2.2 Fungi and Algae as food - Enzymatic Browning and Non- enzymatic Browning.

2.3 Nutritive value of some common foods - Milk, Egg and Soyabeans.

UNIT-III

3.1 Beverages - Definition - Examples – Classification.

3.2 Fruit Beverages - Milk Based Beverages - Malted Beverages - Examples – Alcoholic and Non-Alcoholic Beverages – Examples.

3.3 Appetizers - Definition - Classification - Examples - Water - Functions and Deficiency.

UNIT-IV

4.1 Food Preservatives - Definition - Classification - Food Spoilage - Definition - Prevention.

4.2 Methods of Preservation - Classification - Low and High temperature – Preservatives – Examples.

4.3 Dehydration - Osmotic pressure - Food irradiation.

UNIT-V

5.1 Food Additives - Definition – Artificial sweeteners – Saccharin and Cyclamate - Classification - Their functions - Chemical substances.

5.2 Packaging of Foods – Classification - Materials used for Packaging.

5.3 Food Colours – Restricted use – Spurious Colours – Taste Enhancers – MSG – Vinegar.

Reference Books

- Food Science – B. Srilakshmi, III Edition, New Age International Publishers, 2005.
- Food Chemistry - Lilian Hoagland Meyer, CBS Publishers & Distributors, 2004.
- Food Science, Nutrition and Health – Brian A. Fox, Allan G. Cameron, Edward Arnold, London.
- Fundamentals of Foods and Nutrition - Mudambi R. Sumathi, and Rajagopal, M. V., - Wiley Eastern Ltd., Madras.
- Handbook of Food and Nutrition - M. Swaminathan - Bangalore Printing and Publishing Co. Ltd., Bangalore.

NON – MAJOR ELECTIVE
PAPER – 2
CHEMISTRY IN EVERY DAY LIFE

Objectives:

- To know the basics of Chemistry in our life
- To know about the Food Colours, Plastics, Drugs etc.,

UNIT- I

1.1 General Survey of Chemicals used in everyday life.

1.2 Cosmetics - Talcum Powder, Tooth pastes, Shampoos, Nail Polish and Perfumes -
General formulation - Preparation - Hazards of Cosmetic use.

1.3 Soaps and Detergents – Types - Preparation and Uses.

UNIT-II

2.1 Food and Nutrition - Carbohydrates, Proteins, Fats and Minerals – Examples.

2.2 Vitamins – Definitions – Classification - Sources and their Physiological importance -
Balanced diet.

2.3 Adulterants in Milk, Ghee, Oil, Coffee Powder, Tea, Asafoetida, Chilli Powder, Pulses
and Turmeric Powder - Identification.

UNIT-III

3.1 Food colours used in food - Soft drinks and its Health hazards.

3.2 Food Preservatives – Definition – Examples - Methods of preservation - Low and High
temperature.

3.3 Dehydration - Osmotic pressure - Food irradiation.

UNIT-IV

4.1 Plastics, Polythene, PVC, Bakelite, Polyesters, Resins and their Applications.

4.2 Natural Rubber - Synthetic rubbers - Vulcanisation - Preparation and its Applications.

4.3 Antipyretics, Analgesics, Anaesthetics, Sedatives – Definition - Examples and Uses.

UNIT-V

5.1 Gobar gas – Production – Feasibility and Importance of Biogas with special reference to Rural India.

5.2 Fertilizers – Definition – Classification - Urea, NPK and Super phosphates - Need - Uses and Hazards.

5.3 Sweetening agents – Sucrose and Glucose – Artificial Sweetening agents – Saccharin – Cyclamate – Advantages and Disadvantages.

Reference Books

1. Chemical Process Industries - Norris Shreve Joseph A. Brine .Jr.
2. Perfumes, Cosmetics and Soaps - W. A. Poucher (Vol 3).
3. Environmental Chemistry - A. K. DE.
4. Industrial Chemistry, B. K. Sharma- Goel publishing house Meerut.
5. Food Science - B. Srilakshmi - III Edition - New Age International Publishers, 2005.
6. Food Chemistry, Lillian Hoagland Meyer - CBS publishers & distributors, 2004.
7. Fundamental Concepts of Applied Chemistry - Jayashree Ghosh, S. Chand & Co Ltd., New Delhi – 2010.
8. Applied chemistry - K. Bagavathi Sundari - MJP Publishers (2006).

SEMESTER – V
PAPER – 5
INORGANIC CHEMISTRY – I

Objectives:

- To study about the Halogens and Related compounds.
- To give students a firm grounding in Co-ordination chemistry and Solid state Chemistry.

UNIT-I

1.1 Halogens – Group discussion - Comparative study of F, Cl, Br, I and At - Reactivities – Comparison of Fluorine with Oxygen.

1.2 Classification of Halides - Exceptional properties of Fluorine - Oxyacids of Halogens (Structure only).

1.3 Interhalogen compounds - Preparation, Properties and Geometry of AX, AX₃, AX₅ and AX₇ type of Compounds – Pseudohalogens - Cyanogen and Thiocyanogen – Comparison of Pseudohalogens and Halogens - Basic Properties of Iodine - Evidences.

UNIT-II

2.1 Coordination compounds - Definition of terms used - Classification of Ligands - Chelation and Effect of Chelation - Applications of Complexes - Coordination Number and Stereochemistry of Complexes.

2.2 IUPAC Nomenclature of Complexes - Isomerism in Complexes - Ionisation isomerism, Hydrate Isomerism, Linkage Isomerism, Ligand Isomerism, Coordination Isomerism and Polymerisation Isomerism.

2.3 Geometrical and Optical Isomerism in 4- and 6- Coordinated Complexes – Werner's theory of Coordination Compounds.

UNIT-III

3.1 Sidgwick's Theory - EAN rule - Theory of Bonding - Valence Bond Theory – Postulates of VBT – Hybridisation, Geometry and Magnetic properties - Failure of VBT.

3.2 Crystal field theory - Spectrochemical series - Splitting of d - orbitals in Octahedral, Tetrahedral and Square Planar Complexes - Crystal Field Stabilisation Energy - Calculation of CFSE In Octahedral and Tetrahedral Complexes.

3.3 Low Spin and High Spin Complexes – Explanation of Magnetic Properties, Colour and Geometry Using CFT.

UNIT-IV

4.1 Comparison of VBT and CFT.

4.2 Applications of Coordination Compounds in Qualitative and Quantitative Analysis - Estimation of Nickel using DMG and Aluminium using Oxine – Detection of Potassium ion – Separation of Copper and Cadmium ions.

4.3 Bonding, Hybridization and Structure of Carbonyls of Ni, Cr, Fe, Co, Mn, W and V.

UNIT-V

5.1 The nature of the Solid State – Amorphous and Crystalline – Differences - Close Packing in Crystals – Examples for Cubic, BCC and FCC Lattices - Bragg's law – Application of XRD to Crystal studies – Structure of NaCl, CsCl, CaF₂ and ZnS.

5.2 Band theory of Solids, Metals, Semiconductors and Insulators.

5.3 Defects in solids – Scottky Defect and Frenkel Defect – Metal Excess and Metal Deficiency Defects - Conductors in Ionic Solids – Electrical and Magnetic properties.

PAPER – 6

ORGANIC CHEMISTRY – I

Objectives:

- To effectively impart knowledge about Carbohydrates, Stereochemistry, Conformational Analysis, Nitroalkanes and Heterocyclic chemistry.
- To make the students more inquisitive in learning the Mechanistic details in Organic Chemistry through the teaching of the named reactions.

UNIT- I

1.1 Carbohydrates - Classification – Aldoses and Ketoses, Reducing and Non-reducing Sugars - Reactions of Glucose and Fructose - Osazone formation, Mutarotation and their Mechanism - Structural elucidation of Glucose and Fructose - Pyranose and Furanose forms – Haworth's method.

1.2 Determination of Ring Size- Haworth Projection Formula - Configuration of Glucose and Fructose - Epimerization - Chain lengthening and chain shortening of Aldoses - Inter conversion of Aldoses and Ketoses – Uses of Glucose.

1.3 Disaccharides and Polysaccharides - Reactions and Structural elucidation of Sucrose and Maltose - Properties, Structure and Uses of Starch and Cellulose.

UNIT- II

2.1 Stereoisomerism – Definition - Classification into Optical and Geometrical isomerism. Conditions for Optical Activity – Asymmetric centre – Chirality – Achiral molecules - Meaning of (+) and (-) and D- and L- notations – Elements of symmetry - Projection formulae - Fischer, Flying Wedge, Sawhorse and Newmann projection formulae - Notation

of optical isomers - Cahn - Ingold - Prelog rules - R, S notation of Optical isomers with one Asymmetric carbon atoms – Erythro and Threo representations.

2.2 Optical activities in Compounds not containing Asymmetric Carbon Atoms - Biphenyl, Allenes and Spiranes - Racemisation - Methods of Racemisation (By substitution and Tautomerism) – Resolution - Methods of Resolution (Mechanical, Biochemical and Conversion To Diastereomers) - Asymmetric Synthesis (Partial and Absolute Synthesis) - Walden inversion.

2.3 Geometrical isomerism - Cis - Trans, Syn - Anti and E-Z Notations - Geometrical Isomerism In Maleic and Fumaric Acids and Unsymmetrical Ketoximes - Methods of Distinguishing Geometrical Isomers using Melting Points, Dipole Moment, Dehydration, Cyclisation, Heat of Hydrogenation and Combustion.

UNIT- III

3.1 Conformational analysis - Introduction of terms - Conformations, Configuration, Dihedral Angle, Torsional Strain - Differences between Conformational isomers and Configurational isomers.

3.2 Conformational analysis of Ethane and n-Butane including energy diagrams.

3.3 Conformations of Cyclohexane (Chair, Boat and Twist-Boat forms) - Axial and Equatorial bonds - Ring flipping showing Axial and Equatorial bonds Interconversions – Conformations of Methyl Cyclohexane, Dimethyl Cyclohexane and their stability - 1,2 and 1,3 - Interactions.

UNIT- IV

4.1 Nitroalkanes – Preparation – Properties – Structure – Nitro-Acinitro Tautomerism – Uses of Nitroalkanes – Differences between Primary, Secondary and Tertiary Nitroalkanes.

4.2 Reagents and their Applications in Organic Chemistry – Anhydrous AlCl_3 , P_2O_5 , H_2/Pd - BaSO_4 , Zn/Hg - HCl and Ag_2O .

4.3 Mechanism of Aldol, Perkin and Benzoin condensations - Knoevenagel, Claisen, Wittig, Cannizzaro, Reformatsky and Michael addition reactions.

UNIT- V

5.1 Heterocyclic compounds - Huckel's rule – Aromaticity of Heterocyclic compounds - Preparation, Properties, Structure and Uses of Furan, Pyrrole and Thiophene.

5.2 Preparation and properties of Pyridine and Piperidine - Comparative study of Basicity of Pyrrole, Pyridine and Piperidine with Amines – Nucleophilic and Electrophilic substitution reactions of Pyridine.

5.3 Condensed Five and Six Membered Heterocyclic Compounds - Preparation of Indole, Quinoline and Isoquinoline – Fischer-Indole synthesis, Skraup Quinoline synthesis and Bischler-Napieralski synthesis - Electrophilic substitution reactions.

PAPER- 7
PHYSICAL CHEMISTRY – I

Credits: 4

Hours/ Week: 4

Objectives:

- To impart knowledge about the Solutions, Phase Rule and its Applications, Colligative properties, Chemical Equilibrium, Phase Rule and its Applications, Electrochemistry and its Applications.

Unit-I Solutions

1.1 Solutions of liquids in liquids - Raoult's law – Vapour pressure of ideal solutions – Activity of a component in an ideal solution – Gibbs-Duhem-Margules equation – Thermodynamics of Ideal Solutions.

1.2 Vapour pressure of Non-ideal solutions – Fractional distillation of Binary liquid solutions – Azeotropic mixtures - Distillation of immiscible liquids - Partially miscible liquids - Phenol - Water, Triethylamine – Water and Nicotine – Water systems.

1.3 Nernst distribution law – Definition - Thermodynamic derivation – Applications.

Unit-II Phase rule

2.1 Definition of the terms - Phase, Components and Degrees of freedom – Derivation of Gibbs phase rule

2.2 Applications of phase rule - One component system - Water and Sulphur system – Reduced phase rule - Two components system - Simple eutectic system – Lead-silver system, KI-water system - Freezing mixtures.

2.3 Thermal analysis and cooling curves, Compound formation with congruent melting point – Zn-Mg, FeCl_3 - Water system - Compound formation with incongruent melting point - Na-K System.

Unit-III Colligative properties and Chemical Equilibrium

3.1 Colligative properties - Lowering of vapour pressure - Osmosis and osmotic pressure - Thermodynamic Derivation of Elevation of boiling point and Depression of freezing point – Determination of molar mass – Van't Hoff factor.

3.2 Chemical Equilibrium - Law of Chemical Equilibrium - Thermodynamic derivation of Law of Chemical Equilibrium.

3.3 Van't Hoff Reaction Isotherm - Temperature Dependence of Equilibrium Constant – Van't Hoff Isochore - Le Chatelier's Principle and Its Applications.

UNIT-IV Electrochemistry - I

4.1 Specific conductance and Equivalent conductance - Measurement of equivalent conductance - Variation of Equivalent Conductance and Specific Conductance with Dilution – Ostwald's Dilution Law and Its Limitations.

4.2 Debye-Huckel's theory of Strong Electrolytes - Onsagar equation (No derivation) - Verification and Limitations - Kohlrausch law and its Applications.

4.3 Migration of ions - Ionic Mobility - Ionic Conductance - Transport Number and its determination – Hittorff's method and Moving Boundary method.

UNIT- V Electrochemistry - II

5.1 Applications of Conductometric Measurements - Determination of Degree of Dissociation of Weak Electrolytes, Ionic Product of water - Solubility Product of sparingly soluble salt - Conductometric Titrations.

5.2 Concept of pH - Buffer solutions, Buffer action - Henderson equation - Applications of Buffer Solutions.

5.3 Hydrolysis of Salts - Expressions for Hydrolysis Constant, Degree of Hydrolysis and pH of aqueous salt solutions.

ELECTIVE

PAPER – 1

A. ANALYTICAL CHEMISTRY – 1

Objective:

- To impart knowledge about Data Analysis, Purification of organic compounds, Different Spectroscopic Techniques and their Application.

UNIT – I

1.1. Data analysis – Types of errors – Correction of determinate errors - Idea of Significant Figures and their Importance with examples – Precision and Accuracy – Methods of expressing Accuracy.

1.2. Error analysis – Minimising errors – Methods of expressing Precision – Average deviation – Standard Deviation and Confidence Limit.

1.3. Purification of Solid Organic Compounds – Solvent extraction – Recrystallisation - Use of immiscible solvents – Soxhlet extraction – Crystallisation – Use of miscible solvents – Fractional Crystallisation and Sublimation.

UNIT – II

2.1 Purification of liquids – Experimental Techniques of Distillation – Fractional Distillation – Vacuum Distillation – Steam Distillation – Tests of Purity.

2.2 Gravimetric Analysis – Characteristics of Precipitating Agents – Condition of Precipitation – Types of Precipitants – Purity of Precipitate – Co-precipitation and Post precipitation – Precipitation from Homogeneous Solution – Digestion and Washing of precipitate – Ignition of precipitate – Uses of Sequestering Agents.

2.3 Definition of spectrum – Electromagnetic radiation – Quantization of different forms of energies in molecules (Translational, Rotational, Vibrational and Electronic) – Born-Oppenheimer approximation – Condition of energy of absorption of various types of spectra.

.UNIT – III

3.1 Microwave Spectroscopy – Theory of Microwave Spectroscopy – Selection Rule – Calculation of Moment of Inertia and Bond Lengths of Diatomic molecules – Effect of Isotopic Substitution.

3.2 UV – Visible Spectroscopy – Absorption laws - Calculations involving Beer- Lambert's law – Instrumentation – Photocalorimeter and Spectrophotometer – Block diagrams with description of components – Theory of Electronic Spectroscopy.

3.3 Types of Electronic Transitions – Chromophore and Auxochromes – Absorption bands and Intensity – Factors influencing Position and Intensity of Absorption Bands - Frank-Condon Principle – Applications.

UNIT – IV

4.1 IR Spectroscopy – Principle – Theory of IR spectra – Vibrational Degrees of Freedom - Modes of Vibration of Diatomic Molecules –Triatomic linear (CO_2) and Non-linear Molecules (H_2O) - Stretching and Bending vibrations – Symmetric and Asymmetric Stretching vibrations - Selection rules.

4.2 Expression for Vibrational Frequency (Derivation not needed) – Calculation of Force constant – Factors influencing Vibrational Frequencies - IR Spectrophotometer - Instrumentation – Source, Monochromator, Cell, Detectors, Recorders and Sampling Techniques.

4.3 Applications of IR Spectroscopy – Identification of Functional Groups - Interpretation of the spectra of Alcohols, Aldehydes, Ketones and Esters (Aliphatic and Aromatic) - Hydrogen bonding.

UNIT – V

5.1 Raman Spectroscopy - Rayleigh and Raman scattering – Selection rule – Raman shift - Stokes and Anti-stokes lines - Differences between Raman and IR Spectroscopy.

5.2 Raman Spectrophotometer - Instrumentation – Block diagram – Components and their Functions – Advantages of using Laser in Raman Spectroscopy – Applications – Structural elucidation in the study of Inorganic and Organic Compounds.

5.3 Rotational-Raman spectra of Non - Centrosymmetric molecules - Mutual exclusion principle (CO_2 and N_2O) - Applications – Structural diagnosis.

Reference Books

- Elements of Analytical Chemistry – R. Gopalan, P. S. Subramanian, K. Rengarajan – S. Chand and sons (1997).
- Fundamentals of Analytical Chemistry – D. A. Skoog and D. M. West, Holt Reinhard and Winstor Publications – IV Edition (1982).
- Principles of Instrumental Methods of Analysis – D. A. Skoog and Saunders, College Publications, III Edition (1985).
- Analytical Chemistry – S. M. Khopkar – New age International Publishers.
- Instrumental Methods of Chemical Analysis – Chatwal - Anand, Himalaya Publishing House (2000).
- Analytical Chemistry – R. Gopalan, Sultan Chand.
- Analytical Chemistry – S. Usharani, Macmillan.
- Instrumental Methods of Analysis – 7th Edition – H. H. Willard, L. L. Merit. J. Dean and F. A. Settle –Wadsworth Publishing Company Limited, Belmont, California, USA, 1988.
- Physico- Chemical Techniques of Analysis – P. B. Janarthanan – Vol. I & II – Asian Publishing.
- Instrumental Methods of Chemical Analysis – B. K. Sharma – Goel Publications.
- Applications of Absorption Spectroscopy of Organic Compounds - Prentice Hall, John R. Dyer.
- Spectroscopic Identification of Organic Compounds – R. M. Silverstein, G. C. Bassler and T. C. Morill – John Wiley and Sons.

PAPER – 1

B. BASICS OF COMPUTER PROGRAMMING IN C AND ITS APPLICATIONS IN CHEMISTRY

Objective:

- To introduce the basics of computers.
- To learn C language and its applications in solving problems in Chemistry.

Unit-I

1.1 Basic Computer Organisation, Processor and Memory – Main Memory, Secondary Storage Devices and Storage Hierarchy.

1.2 Software – Relationship between Hardware and Software – Types of Software.

1.3 Planning the Computer Program – Algorithm and Flowcharts - Basics of Operating Systems.

Unit-II

2.1 Computer Languages – Machine Language, Assembly Language, Assembler, Compiler, Interpreter and Programming Languages.

2.2 C language – Introduction - C Compiler - Operating Systems and Preprocessor Directives.

2.3 Variables, Constants, Operators, Input and Output Functions.

Unit-III

Control Structures – Conditional, Looping, Goto, Break, Switch and Continue Statements, Functions, Arrays And Pointers.

Unit-IV

4.1 Applications in Chemistry – Calculation of the Radius of the first Bohr orbit for an Electron.

4.2 Calculation of Half-life Time for an integral order reaction - Calculation of Molarity, Molality and Normality of a solution.

4.3 Calculation of Pressure of Ideal Gases and Van der Waal's gases - Calculation of Electronegativity of an Element using Pauling's relation.

Unit-V

5.1 Applications in Chemistry - Calculation of Empirical Formulae of Hydrocarbons - Calculation of Reduced Mass of a few Diatomic Molecules.

5.2 Determination of the Wave Numbers of Spectral lines of Hydrogen atom - Calculation of Work of Expansion in Adiabatic Process.

5.3 Calculation of pH, Solubility Product and Bond Energy using Born-Landé equation - Calculation of Standard Deviation and Correlation Coefficient.

Reference Books

- Computers in Chemistry, K. V. Raman, 8th Edition, Tata McGraw Hill Publishers, 2005.
- Programming with C, Venugopal and Prasad, 11th Edition, 1971. .
- Programming in C, E. Balaguruswamy, 2nd Edition, 1989.

PAPER – 1

C. ORGANIC SYNTHESIS

Objectives

- To know the Basics of Retrosynthesis.
- To impart knowledge about the Ring Synthesis.

UNIT-I

DISCONNECTION APPROACH

- 1.1 An introduction to Synthons and Synthetic Equivalent.
- 1.2 Disconnection Approach - Functional Group Interconversions.
- 1.3 The importance of the Order of Events in Organic Synthesis - One group C-X and Two group C-X disconnections – Chemoselectivity - Reversal of Polarity.

UNIT-II

PROTECTING GROUPS

- 2.1 Principle of Protection of Alcoholic group and Amino group.
- 2.2 Principle of Protection of Carbonyl group and Carboxyl group.
- 2.3 Activation of Functional Groups.

UNIT-III

ONE GROUP C-C DISCONNECTIONS

- 3.1 Alcohols and Carbonyl Compounds.
- 3.2 Regioselectivity and Alkene Synthesis.
- 3.3 Uses of Acetylenes and Aliphatic Nitro Compounds in Organic Synthesis.

UNIT-IV

TWO GROUP C-C DISCONNECTIONS

- 4.1 Diels-Alder Reaction - 1, 3 - Difunctionalised Compounds.
- 4.2 α , β - Unsaturated Carbonyl Compounds - Control in Carbonyl Condensations.
- 4.3 1, 5 - Difunctionalised Compounds - Michael Addition and Robinson Annulation reactions.

UNIT-V

RING SYNTHESIS

- 5.1 Saturated Heterocyclic Compounds.
- 5.2 Synthesis of 3-, 4- and 6- Membered Rings Aromatic Heterocycles in Organic Synthesis.
- 5.3 Application of the above in the Synthesis of Camphor, Longifoline, Cortisone and Reserpine.

Reference Books

- Some Modern Methods of Organic Synthesis, W. Carruthers, Cambridge University Press, UK.
- Advanced Organic Chemistry, F. A. Carey and R. J. Sundberg, Part- B, Plenum Press.
- Modern Synthetic Reactions. H. O. House and W. A. Benjamin,

ELECTIVE

PAPER – 2

A. PHARMACEUTICAL CHEMISTRY

Objective:

- To effectively impart knowledge about Various Diseases and Their Treatment, Importance of Indian Medicinal Plants and Different Types of Drugs. Preparation, Synthesis and Structural Determination are not required for the Compounds mentioned.

UNIT-I

1.1 Definition of the following terms - Drug, Pharmacophore, Pharmacology, Pharmacopoeia, Bacteria, Virus, Chemotherapy and Vaccine.

1.2 Causes, Symptoms and Treatment for Jaundice, Cholera, Malaria and Filaria - First Aid for Accidents - Antidotes for Poisoning.

1.3 Organic Pharmaceutical Aids - Their Role as Preservatives, Antioxidants, Colouring, Flavouring and Sweetening agents – Examples.

UNIT-II

2.1 Causes, Detection and Control of Anaemia and Diabetes - Diagnostic tests for Sugar, Salt and Cholesterol in Serum and Urine.

2.2 Blood - Composition of Blood and Blood Plasma – RBC – Structure and Functions - Functions of Haemoglobin – WBC - Structure and Functions - Rh Factor – Blood Coagulation – Identification and Estimation of Cholesterol in Blood - Blood Pressure – Hypertension and Hypotension - Normal, High and Low to Control.

2.3 Indian Medicinal Plants and Their Uses - Tulasi, Neem, Kizhanelli, Mango, Semparuthi, Adadodai and Thoothuvelai.

UNIT-III

3.1 Antibacterials - Sulpha drugs – Sulphanilamide Derivatives – Mode of action of Sulpha drugs - Examples - Prontosil, Sulphathiazole and Sulphafurazole – Uses - Antibiotics - Definition – Gram positive and Gram negative bacteria - Uses of Ampicillin, Streptomycin and Tetracyclines.

3.2 Antiseptics and Disinfectants - Definition and Distinction - Phenolic compounds, Chloro compounds and Cationic surfactants.

3.3 Vitamins – Definition – Classification of Vitamins – Sources and Uses – Deficiency Diseases caused by Vitamins.

UNIT-IV

4.1 Analgesics – Definition - Classification - Narcotic and Non- narcotic – Antipyretic analgesics – Mechanism of action - Morphine and its derivatives - Pethedine and Methadone - Salicylic acid derivatives – Antipyretics and Antiinflammatory Agents - Definition and Actions – Aspirin, Paracetamol, Ibuprofen - Disadvantages and Uses.

4.2 Anaesthetics – Definition – Classification - Local and General – Volatile – Uses of volatile liquids as Inhalation Anaesthetics – Chloroform - Gaseous Anaesthetics - Nitrous Oxide, Ether and Cyclopropane - Uses and Disadvantages – Intravenous Anaesthetic Agents – Thiopental sodium, Methohexitol and Propanidid.

4.3 Drugs affecting CNS - Definition, Distinction and Examples for Tranquilizers, Sedatives (Phenobarbital, Diazepam) - Hypnotics, Psychedelic Drugs – LSD, Hashish- Their effects.

UNIT-V

5.1 Antineoplastic Drugs - Causes and Types of Cancer - Treatment of Cancer – Antineoplastic Agents – Antimetabolites - AIDS - AZT, DDC.

5.2 Hormones – Definition - Classification – Physiological Functions of Insulin, Adrenaline, Thyroxin and Oxytacin.

5.3 Sex hormones – Androsterone, Testosterone, Progesterone and Estrogen - Biological functions – Disorders of Hyposecretion and Hypersecretion of Hormones.

Reference Books

1. A Text Book of Pharmaceutical Chemistry - Jayashree Ghosh - S. Chand Company Ltd, 2015.
2. Pharmaceutical Chemistry - S. Lakshmi - Sultan Chand, 2011.
3. Pharmacology and Pharmatherapeutics - R. S. Satoskar - Popular Prakashan - Vol.I and Vol. II.
4. Medicinal Chemistry - Asuthosh Kar - New Age International Publishers, 2007.
5. A Text Book of Synthetic Drugs - O. D. Tyagi - Ammol Publications.
6. Introduction to Biological Chemistry - J. Awapara, Prentice Hall.
7. A Text Book of Biochemistry - Ambika.S.
8. Biochemistry - A. L. Leninger, II Edition, Kalyani Publishers, Ludhiana, 1998.
9. Essentials of Biological Chemistry - James Fanley - East West Press.
10. Medicinal Chemistry - Gurdeep Chatwal – Himalaya Publishers House, 2012.
11. Medicinal Chemistry - Ahluwalia – Ane Books, 2008.
12. A Text Book of Pharmaceutical Chemistry – Viva Books Private Ltd., New Delhi, 2009.
13. Medicinal Plants of India – Rasheeduz Zafar – CBS Publishers and Distributors, 2000.

ELECTIVE
PAPER – 2
B. POLYMER CHEMISTRY

Objective:

- To impart Knowledge about the Types of Polymers, Polymerization Techniques, Commercial Polymers and their Applications.

UNIT-I

1.1 Introduction to Polymers – Monomers, Oligomers, Polymers and their Characteristics - Classification of Polymers – Addition and Condensation Polymers – Natural and synthetic – Linear, Branched, Cross-Linked and Network – Plastics – Elastomers – Fibres – Homopolymers and Copolymers.

1.2 Bonding in Polymers – Primary and Secondary bond forces in Polymers – Cohesive energy and Decomposition of Polymers.

1.3 Chain Growth Polymerisation – Cationic, Anionic and Free radical polymerisation – Stereoregular polymers – Ziegler Natta polymers – Step Growth Polymers.

UNIT-II

2.1 Polymerization Techniques - Bulk, Solution, Suspension and Emulsion Polymerisation - Melt Polycondensation - Polymer Processing – Calendering - Die Casting and Rotational Casting.

2.2 Molecular weight of polymers – Number average – Weight average – Sedimentation and Viscosity – Average molecular weight - Molecular weight and Degree of Polymerisation – Methods of determination of Molecular Weight – Gel permeation chromatography – Ultracentrifugation.

2.3 Reactions – Hydrolysis – Hydrogenation –Addition – Substitution –Cross linking – Vulcanisation – Cyclisation.

UNIT-III

3.1 Plastics and Resins – Definitions – Thermoplastic and Thermosetting Resins – Constituents of Plastic Fibres – Dyes, Pigments, Plasticisers, Lubricants and Catalysts.

3.2 Important Thermoplastic Resins – Acrylics, Polyvinyl and Cellulose Derivatives - Important Thermosetting Resins – Phenolic resins – Epoxy resins.

3.3 Adhesives – Shellac resins – Vegetable glues and Animal glues.

UNIT-IV

4.1 Chemistry of Commercial Polymers - General methods of Preparation and Uses of the following - Teflon, Polyethylene, PTFE, Polystyrene, Polycarbonates and PVC.

4.2 Textile fibres – Definition and Polymer requirement for fibres – Polyamides – Nylon 66 - Nylon 6 – Polyesters – Terylene – Cellulose acetate – Viscose rayon.

4.3 Natural and Synthetic Rubber – Constitution of Natural rubber – Natural Rubber – Isoprene – Synthetic Rubber - Butyl, Buna, Buna- S, SBR, Thiocol, Neoprene, Polyurethane and Silicone Rubber – Ebonite.

UNIT-V

5.1 Advances in Polymers - Biopolymers, Biomaterials, Polymers in Medical Field, High temperature and Fire Resistant Polymers – Applications of Silicones.

5.2 Conducting Polymers – Elementary idea – Examples – Polysulphur Nitriles,

Polyparaphenylene, Polypyrrole, Polythiophene, Polyaniline and Polyacetylene.

5.3 Acrylic polymers – Polymers of Acrylic Acid, Methacrylic Acid and Polyacrylates.

Reference Books

1. Text Book of Polymer Science, F. W. Bill Meyer, Jr. John, Wiley & Sons - 1984.
2. Polymer Science – V, R. Gowarikar, N. V. Viswanathan, Jayadev Sreedhar - Wiley Eastern Ltd., New Delhi - 2005
3. Polymer Chemistry, B. K. Sharma - Goel Publishing House, Meerut - 1989.
5. Polymer Chemistry – M. G. Arora, M. S. Vadar - Anmol Publications (p) Ltd., New Delhi -1998.
6. Polymer Chemistry - An introduction - M. P. Stevens, Oxford - 2002.

ELECTIVE
PAPER – 2
C. GREEN CHEMISTRY

Objective:

- To impart knowledge about Green Solvents, Green Techniques, Green Catalysts and Green Reactions.

UNIT-I Green Chemistry – Introduction

1.1 Need for Green Chemistry – Principles of Green Chemistry – Atom economy – Definition with example (Ibuprofen synthesis) – Green oxidants – Hydrogen peroxide.

1.2 Green synthesis – Evaluation of the type of the reaction – Rearrangements (100 % Atom economic) - Addition reaction (100 % Atom economic).

1.3 Organic reactions by Sonication method – Apparatus required – Examples of Sonochemical Reactions (Heck, Hunsdiecker and Wittig reactions).

UNIT-II Green Solvents

2.1 Selection of Solvents – Aqueous Phase Reactions - Diels-Alder reaction in water – Catalysis in water (Aerobic Oxidation of Alcohols catalysed by Pd (II) / Bathophenanthroline).

2.2 Reactions in ionic liquids - Simple preparation – Types – Properties and Applications – Ionic liquids in Organic Reactions (Heck reaction, Suzuki reactions, Epoxidation), Industrial (Battery) and Analytical Chemistry (Matrices for MALDI-TOF MS, Gas Chromatography Stationary Phases) – Advantages and Disadvantages.

2.3 Solid Supported Synthesis - Supercritical CO₂ – Preparation, Properties and Applications (Decaffeination, Dry cleaning) – Environmental impact.

UNIT-III Green Techniques

3.1 Microwave and Ultrasound Assisted Green Synthesis – Apparatus required – Examples

of MAOS (Synthesis of Fused Anthroquinones, Leukart reductive Amination of Ketones) – Advantages and Disadvantages of MAOS – Aldol condensation – Cannizzaro condensation - Diel's-Alder reaction – Strecker's synthesis.

3.2 Photochemical reactions using Sunlight – Photoreduction of Benzophenone to Benzopinacol using Sunlight - Photochemical alternative to Friedel- Crafts reaction.

3.3 Nanoparticles - Introduction – Types of Nanoparticles – Techniques to prepare Nanoparticles – Top down and Bottom up approaches – Common growth methods.

UNIT-IV Green Catalysis

4.1 Green Catalysis - Heterogeneous catalysis – Uses of Zeolites, Silica, Alumina, Clay supported catalysis – Biocatalysis – Enzymes and Microbes.

4.2 Phase Transfer Catalysis (PTC) – Principles, Catalysts and Lipophilicity of ions – Two phase systems – Solid-Liquid, Liquid-Liquid, Gas-Liquid – Triphase systems – Inverted PTC – Applications in Synthesis.

4.3 Micellar Catalysis, Surfactants and Synthesis in water – Principles, Materials and Synthetic Applications.

UNIT- V Green Reactions

5.1 Acetylation of Primary Amine, Base catalysed Aldol condensation (Synthesis of Dibenzalpropanone), Halogen addition to C = C bond (Bromination of Trans- Stilbene), [4+2] Cycloaddition reaction (Diels-Alder reaction between Furan and Maleic acid).

5.2 Rearrangement reaction (Benzil- Benzilic acid rearrangement), Coenzyme catalyzed Benzoin condensation (Thiamine hydrochloride catalysed synthesis of Benzoin), Pechmann condensation for Coumarin synthesis (Clay catalysed Solid State Synthesis of 7- Hydroxy- 4- methylcoumarin).

5.3 Electrophilic Aromatic Substitution Reactions (Nitration of phenol, Bromination of Acetanilide) – Green oxidation reactions (Synthesis of adipic acid, Preparation of Manganese (III) acetylacetonate) – Zeolite catalyzed Friedel-Crafts acylation.

Books for Study

- Green Chemistry: Environmental Friendly Alternatives, Rs. Sanghi and M. M. Srinivatava, Narosa Publishing House, New Delhi.
- Green Chemistry, V. Ahluwalia, Narosa, New Delhi (2011).
- Nanotechnology, S. Shanmugam, MJP Publishers, Chennai. (2010).
- A Handbook on Nanochemistry, Patrick Salomon, Dominant Publishers and Distributers, New Delhi.
- Nanobiotechnology, S. Balaji, MJP Publishers, Chennai (2010).
- Nano: The Essentials, T. Pradeep, Tata Mc-Graw Hill, New Delhi (2007).

Books for Reference

- Methods and Reagents for Green Chemistry, P. Tundo, A. Perosa and F. Zechini, John Wiley & Sons Inc., New Jercey, (2007).
- The Chemistry of Nanomaterials: Synthesis, Properties and Applications, Vol. I and II, CNR Rao, Springer (2006).
- Nanotechnology: Basic Science and Emerging Technologies, Mick Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse, Overseas Press (2005).
- Nanochemistry, G. B. Segreev, Elsevier, Science, New York, (2006)

SKILL BASED SUBJECT
PAPER – 3
APPLIED CHEMISTRY

Objective:

- To impart Knowledge about Petrochemicals, Paper Technology, Sugar Industry, Explosives, Photography and Dairy Chemistry,

UNIT I

1.1 Petroleum - Origin – Composition of Petroleum - Inorganic, Engler and Modern theories – Classification – Refining (Simple Refinery) – Cracking – Thermal and Catalytic – Knocking – Octane Rating – Antiknock Compounds – Cetane Rating – Synthetic Petrol – LPG.

1.2 Gobar Gas – Production – Feasibility and Importance of Biogas with special reference to Rural India.

1.3 Petrochemicals – Elementary study – Definition - Chemicals from Natural Gas, Petroleum, Light naphtha and Kerosene – Origin – Composition - Synthetic Gasoline.

UNIT II

2.1 Paper technology – Introduction – Manufacture of pulp – Various raw materials used for the preparation of pulp - Preparation of Sulphite pulp, Soda pulp and Rag pulp.

2.2 Various processes - Beating, Refining, Filling, Sizing and Colouring.

2.3 Manufacture of Paper – Calendering – Uses.

UNIT III

3.1 Sugar industry - Sugar industries in India – Sugarcane and sugar beet - Manufacture of cane sugar – Extraction of juice – Concentration – Separation of crystals.

3.2 Recovery of Glucose from Molasses – Defection – Sulphitation – Carbonation – Testing and Estimation of Sugar – Double Sulphitation Process.

3.3 Preparation of Bagasse – Use of Bagasse for Manufacture of Paper and Electricity -

Preparation of Alcohol from Molasses - Preparation of Absolute Alcohol - Manufacture of Wine, Beer, Methylated Spirit and Power Alcohol.

UNIT IV

4.1 Explosives – Primary, Low and High Explosives – Single compound explosives - Binary explosives – Plastic explosives – Dynamites – Blasting explosives - Preparation and Uses of Lead Azide, Nitroglycerine, Nitrocellulose, TNT, Cordite, Picric Acid and Gun Powder – Introduction to Rocket Propellants.

4.2 Photography – Chemical Principle – Preparation of Sensitive Emulsion – Exposure – Developing – Fixing and Printing – Colour photography – Xerographic copying.

4.3 Coal – Classification by rank – Proximate and Ultimate analysis – Low and High Temperature Carbonisation – Otto-Hoffmann’s by-product - Distillation of Coal Tar.

UNIT V

5.1 Milk – Definition – Physico-Chemical properties of milk - Constituents of milk and Their Physico-chemical Properties.

5.2 Chemical change taking place in Milk due to Processing Parameters - Boiling, Pasteurisation, Sterilisation and Homogenisation.

5.3 Definition and Composition of Creams, Butter, Ghee and Ice Creams - Milk Powder - Definition, Need for making powder - Principles involved in Drying process - Spray drying and Drum drying.

Reference Books

1. Fundamental Concepts of Applied Chemistry - Jayashree Ghosh - 1st Edition, S. Chand & Co. Ltd, New Delhi, 2006.
2. Milk and Milk Products - Clarence Henry Eckles, Willes Barnes Combs, Harold Macy - 4th Edition, Tata McGraw Hill Publishing Company Ltd, Reprint 2002.
3. Industrial Chemistry - B. K. Sharma - 13th Edition, Goel Publishing House, 2008.

SEMESTER – VI
PAPER – 8
INORGANIC CHEMISTRY – II

Objectives:

- To impart knowledge about Nuclear chemistry, Radioactivity, Metallurgy, Chemistry of f- Block Elements, Organometallic Compounds and Bio-inorganic Chemistry.

UNIT-I NUCLEAR CHEMISTRY

1.1 Introduction - Composition of Nucleus – Fundamental Particles of Nucleus - Nuclear Forces operating between the Nucleons - N/P ratio – Nuclear Stability - The whole number rule and Packing fraction.

1.2 Isotopes, Isobars and Isotones – Detection and Separation of isotopes

1.3 Nuclear Binding Energy - Mass defect - Simple calculations involving Mass Defect and Binding Energy per Nucleon - Magic Numbers – Liquid drop model - Shell model.

UNIT-II RADIOACTIVITY

2.1 Natural Radioactivity – Properties of Alpha, Beta and Gamma rays - Detection and measurement of Radioactivity - Radioactive series including Neptunium series – Soddy's Group Displacement Law.

2.2 Rate of disintegration and Half - Life period – Derivation - Average life period - Artificial Radioactivity - Induced Radioactivity - Uses of Radioisotopes - Hazards of radiations.

2.3 Nuclear fission - Nuclear energy - Nuclear reactors - Nuclear fusion -Thermonuclear reactions - Energy source of the Sun and Stars – Comparison of Nuclear Fission and Nuclear Fusion.

UNIT-III METALLURGY

3.1 General metallurgy and Metallurgical processes – Methods of Concentration – Gravity separation, Froth floatation process, Magnetic separation – Reduction methods – Smelting, Calcination, Goldschmidt Aluminothermic process - Purification methods – Zone refining, Van Arkel method and Electrolytic refining.

3.2 Comparative study of Ti, V, Cr, Mn and Fe group elements with special reference to Occurrence, Oxidation States, Magnetic Properties and Colour.

3.3 Occurrence and Extraction of Ti, Mo, W and Co - Preparation and Uses of Ammonium Molybdate and V_2O_5 .

UNIT-IV INNER TRANSITION ELEMENTS

4.1 General Characteristics of f- Block elements – Position of Lanthanides in the periodic table – Separation of Lanthanides (Ion exchange method).

4.2 Comparative study of Lanthanides and Actinides - Occurrence, Oxidation states, Magnetic properties, Colour and Spectra.

4.3 Lanthanide Contraction – Causes and Consequences - Comparison between Lanthanides and Actinides – Position of Actinides in the periodic table – Extraction of Thorium and Uranium

UNIT-V ORGANOMETALLIC COMPOUNDS AND BIOINORGANIC CHEMISTRY

5.1 Organometallic Compounds - Definition - Nomenclature – Classification – Organo-Lithium and Organo-Boron Compounds - Preparation, Properties, Structure and Uses.

5.2 Biological Functions of Iron, Copper and Zinc – Biologically Important Compounds – Myoglobin, Cytochrome, Haemoglobin and Ferritin.

5.3 Binary Metallic Compounds – Hydrides, Borides, Carbides and Nitrides – Classification - Preparation, Properties, Structure and Uses.

CORE PRACTICAL
PAPER – 3
GRAVIMETRIC ESTIMATION

1. Estimation of Sulphate as Barium Sulphate.
2. Estimation of Barium as Barium Sulphate.
3. Estimation of Barium as Barium Chromate.
4. Estimation of Lead as Lead Chromate.
5. Estimation of Calcium as Calcium Oxalate Monohydrate.

References

- Qualitative Inorganic Analysis, A.I. Vogel – 7th Edition, Prentice Hall.
- Quantitative Chemical Analysis, A.I. Vogel – 6th Edition, Prentice Hall.

PAPER - 9
ORGANIC CHEMISTRY – II

Objectives:

- To kindle interest in students in learning Bio-organic chemistry through the introduction of topics such as Proteins, Nucleic acids, Terpenes, Alkaloids etc.
- To generate Keen Interest and Thinking in Understanding the Mechanisms of Molecular Rearrangements and Synthetic Applications of Acetoacetic Ester, Benzene Diazonium Chloride, Grignard Reagents and Diazomethane.

UNIT- I Molecular rearrangements

1.1 Rearrangements - Classification – Anionotropic, Cationotropic and Free Radical Rearrangements - Intermolecular and Intramolecular Rearrangements – Examples – Cross over experiment – Differences between Intermolecular and Intramolecular rearrangements.

1.2 Mechanisms, Evidences, Migratory Aptitude, Intermolecular or Intramolecular nature of the following rearrangements - Pinacol-Pinacolone, Benzil-Benzilic acid and Beckmann rearrangement.

1.3 Mechanism of Hoffmann, Curtius, Baeyer-Villiger, Claisen (Sigmatropic), Fries rearrangement, Cope and Oxy-Cope rearrangements.

UNIT-II Amino acids and Polypeptides

2.1 Amino acids – Classification - Essential and Non- Essential amino acids – Acidic, Basic and Neutral Amino Acids – Alpha, Beta and Gamma- Amino acids - Preparation of alpha amino acids – Gabriel's Phthalimide synthesis, Strecker synthesis and Erlenmeyer Azlactone synthesis - Glycine, Alanine and Tryptophan.

2.2 General properties of Amino acids - Reactions of Amino acids due to Amino group and Carboxyl group - Zwitterions - Isoelectric point.

2.3 Peptides - Synthesis - Bergmann Method - Structural Determination of Polypeptides - End Group Analysis – N-Terminal and C-Terminal Amino Acids Determination.

UNIT- III Proteins and Nucleic Acids

3.1 Proteins - Definition - Classification based on Physical Properties, Chemical Properties and Physiological Functions - Primary and Secondary Structure of Proteins - Helical and Beta Sheet Structures (Elementary Treatment Only) – Denaturation of Proteins.

3.2 Nucleic acids – Nucleoproteins - Definition - Types of Nucleic Acids – RNA and DNA - Nucleoside, Nucleotide, Degradation of Nucleotide Chain - Components of RNA and DNA.

3.3 Differences between DNA and RNA - Structures of Ribose and 2- Deoxyribose – Double Helical Structure of DNA - Biological functions of Nucleic Acids - Elementary ideas on Replication and Protein Synthesis.

UNIT-IV Chemistry of Natural Products

4.1 Antibiotics – Definition – Structural elucidation of Penicillin and Chloramphenicol – Uses of Penicillin and Chloramphenicol.

4.2 Alkaloids – Classification – Isolation of alkaloids – General methods of Determination of structure of Alkaloids - Synthesis and Structural Elucidation of Piperine, Coniine and Nicotine.

4.3 Terpenoids – Definition - Classification - Isoprene rule - Synthesis and Structural elucidation of Citral, Menthol and Alpha- pinene.

UNIT- V Organo-Synthetic Reagents

5.1 Acetoacetic ester – Preparation by Claisen ester condensation – Reactions – Synthetic Applications.

5.2 Benzene diazonium chloride – Preparation from aniline – Synthetic Applications – Coupling reactions.

5.3 Grignard Reagents – Preparation – Synthetic Applications – Diazomethane – Preparation by Von-Pechmann method – Synthetic Applications.

CORE PRACTICAL
PAPER – 4
ORGANIC QUALITATIVE ANALYSIS AND PREPARATIONS

Analysis of organic compounds containing one functional group and characterisation with a derivative.

Reactions of the following Functional Groups:

Aldehyde, Ketone, Carboxylic Acid (Mono and Di), Ester, Carbohydrate (Reducing and Non-Reducing), Phenol, Aromatic Primary Amine, Amide, Nitro Compounds, Diamide and Anilide.

Organic Preparations

Acylation

1. Acetylation of Salicylic acid or Aniline.
2. Benzoylation of Aniline or Phenol.

Nitration

3. Preparation of m- Dinitrobenzene
4. Preparation of p- Nitroacetanilide

Halogenation

5. Preparation of p- Bromoacetanilide
6. Preparation of 2,4,6-Tribromophenol

Diazotisation /Coupling

7. Preparation of Methyl Orange

Oxidation

8. Preparation of Benzoic Acid from Toluene or Benzaldehyde.

Hydrolysis

9. Hydrolysis of Ethyl Benzoate (Or) Methyl Salicylate (Or) Benzamide.

Reference Books

- ❖ Vogel's Text Book of Chemical Analysis
- ❖ Practical Chemistry - A. O. Thomas - Scientific Book Center, Cannanore.
- ❖ Practical Chemistry - 3 Volumes - S. Sundaram and others.
- ❖ Text Book of Practical Organic Chemistry – A. I. Vogel, A. R. Tatchell, B. S. Furnis, A. J. Hannaford and P.W. G. Smith – 5th Edition - 1996.
- ❖ Comprehensive Practical Organic Chemistry - Preparation and Quantitative Analysis - V. K. Ahluwalia, Renu Agarwal – Universities Press – 2013.

PAPER- 10
PHYSICAL CHEMISTRY – II

Objectives:

- To impart Knowledge about Electrochemistry, Surface Chemistry, Photochemistry, Chemical Kinetics and Theories of reaction rates.

UNIT- I Electrochemistry - III

1.1 Galvanic cells - Daniel cell - Reversible and Irreversible Cells – EMF of a Cell and its Measurement - Standard Weston Cadmium Cell – Evaluation of Thermodynamic Quantities.

1.2 Derivation of Nernst equation for Electrode Potential and Cell emf –Types of reversible electrodes - Electrode reactions - Electrode potentials.

1.3 Reference electrodes - Standard Hydrogen Electrode - Standard Electrode Potential - Sign conventions - Electrochemical Series and its Applications.

UNIT- II Electrochemistry - IV

2.1 Liquid Junction Potential - Concentration cells With Transference and Without Transference.

2.2 Applications of Concentration cells - Valency of ions, Solubility and Solubility Product - Activity Coefficient of electrolytes - Determination of pH using Hydrogen, Quinhydrone and Glass electrodes – Potentiometric titrations.

2.3 Polarisation - Overvoltage – Storage Cells - Decomposition potential - Lead Storage Battery - Fuel Cells (H_2 - O_2 Cell) - Mechanism of Discharging and Recharging Fuel Cells.

UNIT- III Chemical Kinetics

3.1 Definitions of the terms – Order and Molecularity – Rate of the reaction - Derivations of expressions for Zero, First, Second and Third order rate equations - Study of kinetics by Volumetric, Polarimetric and Spectrophotometric methods - Methods of Determination of Order of a reaction.

3.2 Effect of Temperature on reaction rate - Arrhenius equation - Theories of reaction rates – Bimolecular Collision Theory – Lindmann's theory of Unimolecular Reactions.

3.3 ARRT - Thermodynamic treatment of ARRT – Eyring equation - Comparison of Collision Theory and ARRT.

UNIT- IV Surface Chemistry

4.1 Adsorption – Characteristics of adsorption – Physisorption and Chemisorption – Differences between Physical and Chemical Adsorption - Applications of Adsorption – Adsorption of Gases by Solids – Different Types of Isotherms - Freundlich adsorption isotherm - Langmuir theory of adsorption – Derivation.

4.2 Catalysis – Definition - General Characteristics of Catalytic Reactions – Acid-Base catalysis – Enzyme catalysis – Michaelis-Menton Equation – Effect of Temperature and pH on Enzyme Catalysis.

4.3 Homogeneous catalysis – Function of a catalyst in terms of Gibb's free energy of activation - Heterogeneous catalysis - Kinetics of Unicellular Surface Reactions.

UNIT- V Photochemistry

5.1 Laws of photochemistry - Grothus-Draper law, Stark-Einstein's law – Primary and Secondary processes – Quantum yield and its determination.

5.2 Qualitative description of Fluorescence, Phosphorescence, Luminescence, Chemiluminescence, Bioluminescence and Photosensitized Reactions.

5.3 Kinetics of Photochemical Reactions - $\text{H}_2\text{-Cl}_2$ and $\text{H}_2\text{-Br}_2$ reactions - Photodimerisation of Anthracene

REFERENCE BOOKS

INORGANIC CHEMISTRY

1. Inorganic Chemistry – P. L. Soni - Sultan Chand (2006).
2. Principles of Inorganic Chemistry - B. R. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
3. Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D. Madan - S. Chand Publications (2008).
4. Inorganic Chemistry: Principles of Structure and Reactivity - J. E. Huheey, E. A. Keiter, R. I. Keiter and O. K. Medhi – 2006.
5. Concise Inorganic Chemistry - J. D. Lee - III edition - Von Nostrand.
6. Industrial Chemistry - B. K. Sharma - Goel Publications (1983).
7. Industrial Chemistry R. K. Das - Kalyani Publications, New Delhi (1982).
8. Coordination Chemistry - S. F. A. Kettle - ELBS (1973).
9. Coordination Chemistry - K. Burger - Butterworthy (1973).
10. Vogel's Handbook of Quantitative Inorganic Analysis - Longman.
11. Text Book of Qualitative Inorganic Analysis - A. I. Vogel - III edition (1976).
12. Source Book on Atomic Energy – S. Glasstone- East-West Press Pvt. Ltd. (1967).
13. Nuclear and Radiochemistry - John Wiley and Sons (1964).
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15. Advanced Inorganic Chemistry - Cotton and Wilkinson - V Edition - Wiley and Sons (1988).
16. Text Book of Inorganic Chemistry – R. Gopalan – Universities Press – 2012.
17. Modern Inorganic Chemistry – R. D. Madan - S. Chand Publications, Reprint, 2014.

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1. Organic Chemistry - R. T. Morrison and Boyd – Pearson – 2010.
2. Organic Chemistry - I. L. Finar - Volume I and II - Pearson Education.
3. Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.
4. Advanced Organic Chemistry - Bahl and Arun Bahl - S. Chand and Co. Ltd. – 2012.

5. Stereochemistry, Conformations and Mechanisms - Kalsi – 2nd Edition, Wiley Eastern Ltd., Chennai – 1993.
6. Organic Chemistry of Natural Products - Volume I and II - O. P. Agarwal - Goel Publishing House
7. A Guide Book to Mechanisms in Organic Chemistry - Peter Sykes - Pearson Education - 2006.
8. Stereochemistry of Organic Compounds - D. Nasipuri - New Age International Publishers..
9. Chemistry of Natural Products - Gurdeep Chatwal- Himalaya Publishing House.
10. Reactions and Reagents - O. P. Agarwal- Goel Publishing House.
11. Organic Reaction Mechanisms - Gurdeep Chatwal- Himalaya Publishing House.
12. A Text Book of Organic Chemistry, K. S. Tewari, N. K. Vishnoi, S. N. Mehrotra - Vikas Publishing House - 2011.
13. Modern Organic Chemistry- M. K. Jain and S. C. Sharma- Vishnoi Publications, 2014.
14. Reaction, Mechanism and Structure - Jerry March - John Wiley and Sons, NY -1992.
15. Organic Chemistry - Bruice - Pearson Education.
16. Text Book of Organic Chemistry – C. N. Pillai – Universities Press – 2009.
17. Organic Reaction Mechanisms - Parmar and Chawla – S. Chand & Co.
18. Organic Chemistry – I. L. Finar - 6th Edition, Pearson Education, 2008.
19. A Guide Book to Mechanisms in Organic Chemistry – Peter Sykes - Pearson Education, 2006
20. Stereochemistry of Carbon Compounds- E. I. Eliel – Tata Mcgrow Hill Education – 2000.
21. Organic Chemistry - T. W. Graham Solomon, C. B. Fryhle – S. A. Snyder – John Wiley & Sons – 2014.
22. Advanced Organic Reaction Mechanism (Problems and Solutions) – N. Tewari – Books and Allied (P) Ltd – 2005.
23. Advanced Organic Stereochemistry (Problems and Solutions) – N Tewari - Books and Allied (P) Ltd – 2010.

PHYSICAL CHEMISTRY

1. Principles of Physical Chemistry - B. R. Puri, Sharma and Madan S. Pathania, Vishnal Publishing Co., - 2013.
2. Text Book of Physical Chemistry - P. L. Soni, O. P. Dharmarha and U. N Dash - Sultan Chand & Co., – 2006.
3. Physical Chemistry - Negi and Anand – Eastern Wiley Pvt.Ltd..
4. Physical Chemistry - Kundu and Jain - S. Chand & Co.
5. Physical Chemistry - K. L. Kapoor - Macmillan - 4 volumes.
6. Elements of Physical Chemistry - Glasstone and Lewis - Macmillan.
7. Text book of Physical Chemistry - S. Glasstone - Macmillan (India) Ltd.
8. Fundamentals of Physical Chemistry - Maron and Landor - Colier - Macmillan.
9. Physical Chemistry - G. W. Castellan - Narosa publishing house - 2004.
10. Physical Chemistry - Walter J. Moore - Orient Longman – 1972.
11. Numerical Problems on Physical Chemistry, Gashal - Books and Allied (P) Ltd.,
12. Universal General Chemistry, C.N.R. Rao, Macmillan.
13. Group Theory and its Chemical Applications - P. K. Bhattacharya - Himalaya Publishing House.
14. Text book of Physical Chemistry – M. V. Sangaranarayanan, V. Mahadevan, Universities Press - 2011.
15. General and Physical Chemistry – Dr. A. Arunabhasan, Books of Allied (P) Ltd., - Ghosal – 2009.

CORE PRACTICAL
PAPER – 5
PHYSICAL CHEMISTRY EXPERIMENTS

1. Kinetics

Determination of the Order of the following reactions

- a) Acid catalysed Hydrolysis of an Ester (Methyl or Ethyl acetate)
- b) Saponification of an Ester (Methyl or Ethyl Acetate)
- c) Iodination of Acetone.

2. Molecular weight of a solute - Rast's method using Naphthalene or Diphenyl as Solvents.

3. Heterogeneous equilibria

- a) *Phenol-Water system – CST

- b) Effect of impurity – 2 % NaCl or Succinic acid solutions on Phenol -Water system -

Determination of the Concentration of the given solution

4. Determination of the Transition Temperature of the given salt hydrate. $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$, $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$, $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$

5. Electrochemistry

Conductivity

- a) Determination of Cell Constant and Equivalent Conductivities of the solutions of two different concentrations.
- b) Conductometric titration of a Strong Acid against a Strong Base.

6. Potentiometric titration of a Strong Acid against a Strong Base.

7. Colorimetry- Determination of unknown concentration using Photoelectric colorimeter.

8. Determination of pKa of acetic acid using pH Meter.

***Need not be given in examination.**

Students must write Short Procedure / Formula with explanation in Ten Minutes for evaluation during the university practical examination.

ELECTIVE

PAPER – 3

A. ANALYTICAL CHEMISTRY – II

Objective:

- To impart knowledge about Different Chromatographic and Spectroscopic Techniques.

UNIT – I

1.1 Chromatography – Principles and Techniques of Column, Paper and Thin Layer Chromatography – Column Chromatography – Preparation of Column - Adsorption - Adsorbents – Elution – Recovery of Substances.

1.2 TLC - Choice of Adsorbent and Solvents – Preparation of Chromatogram and Applications - R_f value - Paper Chromatography – Solvents used – Factors affecting R_f value – Separation of Amino Acid Mixtures – Radial Paper Chromatography - Applications.

1.3 Ion exchange chromatography – Principle – Experimental Techniques – Types of Resins – Requirement of a Good Resin – Action of Ion Exchange Resins – Experimental Techniques and Applications – Separation of Zinc- Magnesium, Cobalt - Nickel and Cadmium - Zinc ions.

UNIT – II

2.1 High Pressure Liquid Chromatography and Gas Chromatography – Principle and Applications.

2.2 Gas Chromatography – Mass Spectrophotometer (GC-MS) - Liquid Chromatography - Mass Spectrophotometer (LC-MS) - Principle and Applications.

2.3 Polarography – Principle – DME – Advantages and Disadvantages – Ilkovic equation and its significance (No Derivation) - Polarography as an Analytical tool in Quantitative and Qualitative Analysis – Amperometric Titrations.

UNIT – III

3.1 NMR Spectroscopy – Principle of Nuclear Magnetic Resonance – Basic Instrumentation.

3.2 Number of Signals – Chemical Shift – Shielding and Deshielding – Factors influencing Chemical Shift - Spin-Spin Coupling and Coupling constants - TMS as NMR standard.

3.3 Splitting of Signals – NMR Spectra of simple Organic Molecules – Applications in Structural Elucidation.

UNIT – IV

4.1 Mass Spectroscopy – Basic principles of Mass Spectrum - Instrumentation – Molecular ion peak- Base peak - Metastable peak - Isotopic peak and their Uses.

4.2 Fragmentation – Factors affecting Cleavage Patterns - Nitrogen rule – Ring rule – McLafferty rearrangement - Determination of Molecular Formulae with examples.

4.3 Mass spectrum of simple organic compounds – Identification – Alcohols, Aldehydes and Aromatic hydrocarbons.

UNIT – V

5.1 ESR Spectroscopy – Condition – Selection Rule for Transition - Theory of ESR Spectra – Basic Instrumentation - ESR Spectrometer – Components and their Functions - Hyperfine splitting – ESR Spectra of simple radicals – CH_3 , CD_3 , Naphthalene radical ions only – Applications in structural elucidation.

5.2 Thermoanalytical methods – Principle involved in Thermogravimetric analysis (TGA) and Differential Thermal Analysis (DTA) – Instrumentation- Discussion of Various Components with Block Diagram.

5.3 Characteristics of TGA ($\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) and DTA curves – Factors Affecting TGA and DTA Curves – Thermometric Titrations – Principle and Applications.

Reference Books

1. Analytical Chemistry – S. M. Khopkar – New Age International Publishers – 1998.
2. Analytical Chemistry – R. Gopalan – Sultan Chand & Sons – 2002.
3. Chemical Analysis: An Instrumental Approach – A. K. Srivastava and P. C. Jain.
4. Spectroscopic Identification of Organic Compounds – R. M. Silverstein, G. C. Basseler & T. C. Morill.
5. Organic Spectroscopy – W. Kemp.
6. Spectroscopic Methods in Organic Chemistry – D. Williams & I. Fleming.
7. Fundamentals of Molecular Spectroscopy – 4th Edition, C. N. Banwell and E. M. McCash – Tata McGraw Hill Publishers, New Delhi - 2006.
8. Applications of Absorption Spectroscopy of Organic Compounds – John R. Dyer.
9. Introduction to Molecular Spectroscopy – Barrow.
10. Spectroscopy of Organic Compounds - P. S. Kalsi.
11. Instrumental Methods of Chemical Analysis – B. K. Sharma – Goel Publications – 2000.
12. Fundamentals of Analytical Chemistry: An introduction – D. A. Skoog, D. M. West – Thomson – 2004.
13. Analytical Chemistry: Theory and Practice – U. N. Dash.
14. Vibrational Spectroscopy - D. N. Sathyanarayanan – New Age International Publishers – 2000.
15. Fundamentals of Spectroscopy – Y. R. Sharma – S. Chand – 2008.
16. Fundamentals of Molecular Spectroscopy – 4th Edition – C. N. Banwell and E. M. McCash – Tata McGraw Hill, New Delhi – 2006.
17. Elementary Organic Spectroscopy – Principles and Chemical Applications – Y. R. Sharma, S. Chand & Company Private Limited, V Revised Edition – 2013.

ELECTIVE PAPER – 2
B. TEXTILE CHEMISTRY

Objective:

- To impart knowledge about the Production, Properties and Applications of Natural and Synthetic Fibres, Colour and Constitution, Classification of Dyes and Concept of Dyeing in Textile Industry.

UNIT – I

1.1 General Classification of Fibres – Chemical structure – Production – Properties – Count, Denier, Tex, Staple Length, Spinning Properties, Strength, Elasticity and Creep.

1.2 Applications of the following Natural Cellulose Fibres (Cotton and Jute).

1.3 Natural Protein Fibres (Wool and Silk) – General characteristics.

UNIT – II

2.1 Chemical Structure, Production and properties of the following Synthetic Fibres - Man-made Cellulose Fibres (Rayon and Modified cellulose fibres).

2.2 Polyamide Fibres (Different types of Nylons) - Preparation – Nylon degradation – Polyester Fibres – Preparation - Degradation – Polyacrylonitrile fibre - Preparation and Properties – Viscose fibre - Preparation and Properties.

2.3 Identification tests for Cellulose, Cotton, Wool, Silk, Rayon, Acrylic, Viscose, Polyamide and Polyester Fibres.

UNIT – III

3.1 Impurities in Raw Cotton and Grey Cloth, Wool and Silk.

3.2 General principles of the Removal, Scouring - Purpose, Alkali Scouring and Acid Scouring – Bleaching (Methods - Hypochlorite, Peroxide and Bleaching Powder) - Desizing (Hydrolytic and Enzymatic), Kier Boiling and Chemicking.

3.3 Dyeing of Polyester and Blends – Functions of Dispersing agents - Fibre swelling – Carrier dyeing - High temperature dyeing - Selection of dyestuff.

UNIT – IV

4.1 Colour and Constitution – A general treatment – Chromophores – Auxochromes - Bathochromes and Hypsochromes.

4.2 Classification of dyes – Acidic, Basic, Direct, Mordant, Azoic, Ingrain, Vat and Reactive Dyes - Classification as per Chemical constitution – Azo dyes – Triphenyl Methane Dyes, Phthalein Dyes, Indigo and Anthraquinone Dyes.

4.3 Structure, Preparation and Uses – Methyl Orange, Phenolphthalein and Malachite Green.

UNIT – V

5.1 Dyeing - Dyeing of Wool and Silk – Fastness properties of dyed materials.

5.2 Dyeing of Nylon, Terylene and other Synthetic Fibres – Finishing – Finishes given to Fabrics – Mechanical finishes on Cotton, Wool and Silk.

5.3 Method used in process of Mercerizing – Anticrease and Antishrink finishes – Water Proofing.

References

- Chemical Technology of Fibrous Materials - F. Sadov, M. Horchagin and A. Matetshy, Mir Publishers.
- The Identification of Textile Fibres - Bruno Nuntak.
- Introduction to Textile Science - 3rd edition, Maryory L. Joseph.
- Textile Chemistry – Vol. II, R. H. Peters, Elsevier, Amsterdam.
- Dyeing and Chemical Technology of Textile Fibres – 5th Edition, E. R. Trotman, Charles Griffin & Co Ltd.
- Chemistry of dyes & Principles of Dyeing – V. A. Shenai, Sevak Publications.
- Scouring and Bleaching, E. R. Trotman, Charles Griffin & Co Ltd.
- Text Book of Applied Chemistry - K. Kapur.
- A Students Text Book of Textile Science – A. J. Hall.

ELECTIVE
PAPER – 3
C. NANO CHEMISTRY

Objectives:

- To introduce the Basics of Nanotechnology.
- To learn the Instrumental Techniques used in Characterisation of Nanomaterials.

UNIT-I Basics of Nanochemistry

Introduction – Definition – Length scales – Importance of Nanoscale and its Technology – Self Assembly of Materials – Self Assembly of Molecules – Porous solids, Nanowires, Nanomachines and Quantum Dots.

UNIT-II Nanoparticles

Introduction – Types of Nanoparticles – Preparation, Properties and Uses of Gold, Silicon, Silver, Zinc Oxide, Iron Oxide, Alumina and Titania Nanoparticles.

UNIT-III Synthetic Techniques

Techniques to Synthesise Nanoparticles – Top down and Bottom up Approaches – Common Growth Methods – Characterisation of Nanoparticles – Applications and Toxic effects of Nanomaterials.

UNIT-IV Nanomaterials

Preparation, Properties and Applications of Carbon Nanotubes, Nanorods, Nanofibres and Nanoclays.

UNIT-V Instrumental Techniques

Electron Microscopes – Scanning Electron Microscopes (SEM) – Transmission Electron Microscopes (TEM) – Scanning Probe Microscopy – Atomic Force Microscopy (AFM) – Scanning Tunneling Electron Microscope (STEM) – Basic Principles only.

Books for Study

- Nanotechnology, S. Shanmugam, MJP Publishers, Chennai (2010).
- A Handbook on Nanochemistry, Patrick Salomon, Dominant Publishers and Distributors, New Delhi.
- Nanobiotechnology, S. Balaji, MJP Publishers, Chennai (2010).

Books for Reference

- The Chemistry of Nanomaterials: Synthesis, Properties and Applications, Vol. I and II, CNR Rao, Springer (2006).
- Nanotechnology: Basic Science and Emerging Technologies, Mick Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse, Overseas Press (2005).
- Nanochemistry, G. B. Segreev, Elsevier, Science, New York, (2006).
- Nano: The Essentials, T. Pradeep, Tata Mc-Graw Hil Publishers, New Delhi (2007).
- Text Book of Nanoscience and NanoTechnology, P. Shankar Baldev Raj, B. B. Rath and James Murday – 2014.

SKILL BASED SUBJECT
PAPER – 4
AGRICULTURE AND LEATHER CHEMISTRY

OBJECTIVE:

- To learn about Soil fertility and Productivity, Soil Chemistry, Insecticides, Leather Industry and Treatment of Tannery Effluents.

Unit-I Soil Chemistry

1.1 Soil – Introduction - Classification - Properties of Soil – Physical properties – Components – Structure and Texture - Soil-Water, Soil-Air and Soil-Temperature.

1.2 Chemical properties - Soil Minerals, Soil Colloids, Soil Reaction and Buffering – Analysis of Soil - Soil pH – Determination of Soil pH – Effect of pH on Plants – Buffering of soil - Soil acidity, Soil salinity and Soil alkalinity.

1.3 Soil Fertility – Carbon and Nitrogen cycle - Acid, Alkaline and Saline soils – Their Formation - Reclamation – Liming agents.

UNIT-II Fertilisers and Manures

2.1 Fertilisers – Definition - Classification – Requirements of a Good fertiliser - Nitrogen fertiliser – Urea – Preparation and Uses – Potash fertiliser – KCl, K₂SO₄ and KNO₂ - Preparation and Uses – Phosphorus fertiliser – Phosphatic slag, Superphosphate of lime and Triple Superphosphate - Preparation and Uses- NPK fertiliser - Advantages– Role of Micronutrients.

2.2 Manures – Compost – Composting - Methods of Composting - Farmyard Manure, Vermicompost, Composted Coconut Coir Pith, Press mud and Poultry manure – Applications.

2.3 Types of pollutions caused by Fertilisers - Ill effects of Fertilisers and their Control.

UNIT-III Insecticides and Fungicides

3.1 Insecticides – Definition - Classification of Insecticides - Stomach poisons - Contact poisons and Fumigants - Insecticides - Organic Insecticides - DDT - Gammexane - Malathion – Parathion.

3.2 Fungicides – Inorganic Fungicides – Sulphur compounds – Copper compounds – Mercuric compounds – Organic Fungicides – Dithiocarbamates – Dithane M – Bordeaux mixture.

3.3 Herbicides - Rodenticides - Pesticides in India - Adverse Environmental Effects of Pesticides.

UNIT- IV Leather Chemistry

4.1 Introduction - Constituents of Animal Skin - Preparing Skins and Hides – Leather processing – Process before Tannage – Flaying, Curing, Drying, Pickling, Cleaning and Soaking - Liming and Degreasing.

4.2 Manufacture of Leather - Leather Tanning methods - Vegetable Tanning – Chemistry of Chrome Tanning and Mineral Tanning – Deliming.

4.3 Dyeing of Leather and Fat Liquoring - Leather Finishing - Oil Tanning - By products.

UNIT- V Tannery Effluents

5.1 Tannery effluents - Pollution and its control - Water pollution and Air pollution - Waste Management.

5.2 Treatment of Tannery Effluents - Primary, Secondary and Tertiary treatment - Pollution Prevention.

5.3 Effect of Tannery Effluents on Agriculture – Organic Amendments - Reclamation of Tannery Effluents Affected Soil.

Reference Books

- Industrial Chemistry by B. K. Sharma - Goel Publishing House, Meerut.
- Applied Chemistry by K. Bagavathi Sundari, MJP Publishers, 2006.
- Fundamental Concept of Applied Chemistry by Jayashree Ghosh, S. Chand & Company Ltd.,
- The Nature and Properties of Soils - IX Edition - Nyle. C. Bready - S. Chand.
- Soils and Soil Fertility - Louis M. Thompson - and Frederick. R. Troch - Tata Mc Graw Hill Publishing Co.
- Text Book of Soil Science - T. D. Biswas and S. K. Mukerjee - II Edition.
- Soil Science - A. Sankara.
- Fundamentals of Leather Science - Wood roffe Publications of CLRI - Chennai.
- Nature and Properties of Soils - Harry, O. Buckman.

SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS
PRACTICAL – I
VOLUMETRIC ANALYSIS

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Procedure: 10 Marks

Error upto 2 % : 50

 2.1 – 3 % : 40

 3.1 – 4 % : 30

 4.1 – 5 % : 20

 >5 % : 10

For incomplete or wrong calculation deduct 20 % of total marks scored.

For no calculation deduct 40 % of total marks scored.

For each arithmetic error deduct 1 mark.

CORE PRACTICAL – II
INORGANIC QUALITATIVE ANALYSIS AND PREPARATION

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Preparation: 20 (Quantity- 15 Marks; Quality- 5 marks)

Analysis: 40 Marks.

Each radical with procedure: 10 Marks

(Spotting for each radical - 5 Marks; Fixing the group - 5 Marks)

PRACTICAL - III

GRAVIMETRIC ANALYSIS

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Procedure: 10 Marks

Error upto 2 % : 50

 2.1 – 3 % : 40

 3.1 – 4 % : 30

 4.1 – 5 % : 20

 >5 % : 10

- a. Among the duplicate results, the value more favorable to the candidate must be taken.
- b. When no duplicate result is given deduct 5 marks.
- c. If the two results differ by more than 2 % deduct 5 marks.
- d. For each independent arithmetical error deduct 1 mark.
- e. For incomplete or wrong calculation deduct 20 %.
- f. For no calculation deduct 40 %.
- g. If the experiment is not completed due to an accident, award 5 marks.

PRACTICAL - IV

ORGANIC ANALYSIS

Internal assessment: 25 Marks

External assessment: 75 marks

Total: 100 marks

Record: 15 Marks

Preparation: 15 (quantity: 10 & quality: 5)

Analysis: 45

Preliminary reaction: 4

Aliphatic/ Aromatic: 4

Saturated/ Unsaturated: 4

Tests for elements: 9

Functional groups: 10

Confirmatory tests: 10

Derivative/Coloured reaction: 4

PHYSICAL CHEMISTRY PRACTICALS

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 Marks

Record: 15 Marks

Experiment: 45 Marks

Manipulation, Tabulation and Calculation: 15 Marks

1) Kinetics

Graph : 10 Marks

Below a factor of 10 : 35

By a factor of 10 : 25

More than a factor of 10 : 15

2) Molecular weight

Error upto 10 %: 45

20 %: 35

30 %: 25

> 30 %: 15

3) Effect of electrolyte on CST

Graph: 10

Error upto 10 %: 35

20 %: 25

30 %: 15

> 30: 10

4) Transition temperature

Graph: 10

Error upto 2°C difference: 35

7°C difference: 25

> 7°C difference: 15

5) Conductance

Equivalent conductance: 25 marks

Error upto 10 % : 25

Upto 15 % : 15

>15 % : 10

Cell constant : 20 marks

Error upto 10 % : 20

Upto 15 % : 15

>15 % : 10

6) Conductometric titration

Graph: 10

Upto 2 % : 35

2.1 to 3 % : 30

3.1 to 4 % : 25

4.1 to 5 % : 20

> 5% : 15

THIRUVALLUVAR UNIVERSITY**B.Sc. COMPUTER SCIENCE****DEGREE COURSE****CBCS PATTERN****(With effect from 2017 - 2018)****The Course of Study and the Scheme of Examinations**

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|------------------|-------------|----------------------|--------|--|---------------|--------------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper - 1 | 6 | 6 | Digital Logic & Programming in C | 25 | 75 | 100 |
| 4 | III | Core Practical | Practical-1 | 3 | 2 | Programming in C Lab | 25 | 75 | 100 |
| 5 | III | ALLIED 1 | Paper-1 | 7 | 4 | (to choose any one) 1. Mathematics I 2. Mathematical Foundations I | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 22 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core Theory | Paper-2 | 6 | 6 | C++& Data Structures | 25 | 75 | 100 |
| 10 | III | Core Practical | Practical-2 | 3 | 2 | C++ and Data Structure lab | 25 | 75 | 100 |
| 11 | III | Allied 1 | Paper-2 | 7 | 6 | (to choose any one) 1. Mathematics II 2. Mathematical Foundations II | 25 | 75 | 100 |
| 12 | IV | Soft skill | | 2 | 1 | Soft skill | 25 | 75 | 100 |

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|-----------------------|-------------|----------------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| 13 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-3 | 3 | 3 | Java Programming | 25 | 75 | 100 |
| 17 | III | Core Practical | Practical-3 | 3 | 3 | Java Programming Lab | 25 | 75 | 100 |
| 18 | III | Allied II | Paper-3 | 4 | 4 | (to choose any one) 1. Physics I 2. Statistical Methods and their Applications | 25 | 75 | 100 |
| 19 | III | Allied II | Practical | 3 | 0 | Physics / Statistics Practical | 0 | 0 | 0 |
| 20 | IV | Skill Based Subject I | Paper-1 | 3 | 3 | Design & Analysis of Algorithm | 25 | 75 | 100 |
| 21 | IV | Non-Major Elective I | Paper-1 | 2 | 2 | Introduction to Information Technology | 25 | 75 | 100 |
| | | | | 30 | 23 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 22 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 23 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 24 | III | Core Theory | Paper-4 | 3 | 3 | Database Management Systems | 25 | 75 | 100 |
| 25 | III | Core Practical | Practical-4 | 3 | 3 | RDBMS Lab | 25 | 75 | 100 |
| 26 | III | Allied II | Paper-4 | 4 | 4 | (to choose any one) 1. Physics II | 25 | 75 | 100 |

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|-------------------------------|-----------------|----------------------|--------|---|---------------|--------------|-------|
| | | Course Title | | | | | | | |
| | | | | | | 2. Statistical Methods and their Applications II | | | |
| 27 | III | Allied Practical | Practical | 3 | 2 | Physics / Statistics practicals | 25 | 75 | 100 |
| 28 | IV | Skill Based Subject II | Paper-2 | 3 | 3 | Computer Organisation and Architecture | 25 | 75 | 100 |
| 29 | IV | Non- Major Elective II | Paper-2 | 2 | 2 | Internet and its Applications | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |
| | | | | | | | | | |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 30 | III | Core Theory | Paper-5 | 6 | 3 | Mobile Application Development | 25 | 75 | 100 |
| 31 | III | Core Theory | Paper-6 | 6 | 3 | Operating System | 25 | 75 | 100 |
| 32 | III | Core Theory | Paper – 7 | 4 | 2 | Data Communication & Network | 25 | 75 | 100 |
| 33 | III | Core Practical | Practical- 5 | 4 | 3 | Mobile Applications Development - Lab | 25 | 75 | 100 |
| 34 | III | Core Practical | Practical- 6 | 4 | 3 | Operating System - Lab | 25 | 75 | 100 |
| 35 | III | Elective I | Paper-1 | 3 | 3 | 1. Data Mining 2. Computer Graphics 3. Information Security | 25 | 75 | 100 |
| 36 | IV | Skill Based Subject III | Paper-3 | 3 | 3 | Software Engineering | 25 | 75 | 100 |
| | | | | 30 | 20 | | 175 | 525 | 700 |
| | | | | | | | | | |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 37 | III | Core Theory | Paper-8 | 7 | 5 | Cloud Computing | 25 | 75 | 100 |
| 38 | III | Core Theory | Paper-9 | 6 | 4 | Open Source Programming | 25 | 75 | 100 |
| 39 | III | Core | Practical- | 4 | 3 | ASP .NET Lab | 25 | 75 | 100 |

| S.NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------|------|------------------------|-------------|----------------|--------|--|---------------|-----|-----|
| | | Course Title | | | | | | | |
| | | Practical | 7 | | | | | | |
| 40 | III | Core Practical | Practical-8 | 4 | 3 | Open Source Programming - Lab | 25 | 75 | 100 |
| 41 | III | Elective II | Paper-2 | 3 | 3 | 1. Software Testing 2. Mobile Computing 3. Microprocessor | 25 | 75 | 100 |
| 42 | III | Elective III | Paper-3 | 3 | 3 | 1. Internet of Things 2. System Software 3. Multimedia Systems | 25 | 75 | 100 |
| 43 | IV | Skill Based Subject IV | Paper-4 | 3 | 3 | ASP .NET | 25 | 75 | 100 |
| 44 | V | Extension Activities | | 0 | 1 | | 100 | 0 | 100 |
| | | | | 30 | 25 | | 275 | 525 | 800 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|--------------------------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100+100 (I + III SEM) | 200 |
| | Allied (Even Semester) | 2 | 6+4 | 10 | 100+100 (II + IV SEM) | 200 |
| | Allied Practical | 1 | 2 | 2 | 100 | 100 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core | 9 | (3-6) | 35 | 100 | 900 |
| | Core Practical | 8 | (2-3) | 22 | 100 | 800 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 43 | | 140 | | 4300 |

THIRUVALLUVAR UNIVERSITY

B.Sc. COMPUTER SCIENCE

SYLLABUS UNDER CBCS

(with effect from 2017 - 2018)

SEMESTER I

PAPER – 1

Digital Logic & Programming in C

Objective:

Provide basic knowledge on Digital Electronics to understand the working principles of Digital computer and to develop programming skill using C language.

UNIT I: Number systems and Boolean algebra

Number Systems - Decimal, Binary, Octal, Hexadecimal and their inter conversions, - Binary Arithmetic - 1's complement, 2's complement and 9's complement .Binary codes - BCD, Excess-3, Graycode.

Boolean Algebra: Boolean Laws - Simplification of Boolean Functions - Logic gates and Truth Table – Universal Gates (NAND and NOR) - The K-map method up to five variables, don't care conditions, POS & SOP forms.

UNIT-II: Combinational and Sequential Circuits

Combinational Logic: Half/Full adder/subtractor, code conversion, Multiplexers, de multiplexers, encoders, decoders, Combinational design using MUX & DEMUX. BCD adder, magnitude comparator.

Sequential logic: Flip flops (RS, Clocked RS, D, JK, JK Master Slave)-Counters & types Synchronous and Asynchronous counters- Registers, Shift registers and their types.

UNIT –III: C Basics and Control constructs

C fundamentals- Operators- Constants- Expression – Library functions- Decision making and branching- Switch- FOR, WHILE, DO WHILE loops-continue-break

Unit IV: Arrays, Functions and Structures

Arrays-Multi dimensional arrays- User defines functions- Call by Value and reference-Recursion- Storage classes- Structures and Union –Self referential structures

Unit – V: Pointers and Files

Pointers- Pointer operations and Arithmetic- File management in C : File opening and closing- - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

Text Book:

1. Morris Mono M. “**Digital Logic and Computer Design**”, PHI Latest Pub. Ed. (Unit I and 2)
2. ReemaThareja,” **Programming in C** “ Oxford University Press 2014

Reference Book

1. Albert Paul Malvino, Donald P Leach, **Digital principles and applications** TMH, 1996.
2. Balagurusamy,” Programming in C” TMH

CORE PRACTICAL – I
PROGRAMMING IN C - LAB

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5. ${}^n P_r$, ${}^n C_r$ in a single program using function
6. Matrix Addition, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

ALLIED

1. MATHEMATICS – I

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots-Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians - Concepts of polar co-ordinates - Curvature and radius of curvature in Cartesian co-ordinates and in polar co-ordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
3. P.R.Vittal (2003) *Allied Mathematics* .Marghan Publications, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai.

2. MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}, \lim_{x \rightarrow 0} \frac{\sin x}{x}, \lim_{x \rightarrow 0} \frac{\tan x}{x}, \lim_{x \rightarrow 0} \frac{e^x - 1}{x}, \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n, \lim_{n \rightarrow 0} (1 + n)^{1/n}$$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian& Others, Analytical Geometry 2 Dimension - Emerald publication 1992 Reprint.
4. Manicavachagompillay&Natarajan. Analytical Geometry part I - Two Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER II
CORE THEORY PAPER – 2
C++ AND DATA STRUCTURE

Objective: To develop Object oriented programming skills using C++ and to introduce data structure concepts.

UNIT-I: Object Oriented Concepts and C++

C++ Fundamentals - Operators, Expressions and Control Structures: If,If..Else, Switch - Repetitive Statements- for,while,do..while - Input and Output in C++ - manipulators-manipulators with parameters. - Pointers and arrays

UNIT-II: Functions and Classes

Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading. Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

UNIT – III: Inheritance, Polymorphism & Files

Inheritance : Single Inheritance - Multilevel inheritance - Multiple inheritance - Hierarchical Inheritance - Hybrid Inheritance - Polymorphism - Working with Files : Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - Updating a File - Error Handling during File Operations .

UNIT-IV: Fundamental Data Structures

Definition of a Data structure - primitive and composite Data Types, Stacks (Array) - Operations –Linked Stack-Operations- Applications of Stack (Infix to Postfix Conversion).

Queue (Array)- operations-Linked Queue- Operations- - Singly Linked List - Operations, Application of List (Polynomial Addition)-. Doubly Linked List - Operations.

UNIT-V : Trees and Graphs

Trees: Binary Trees –Binary Search Tree- Operations - Recursive Tree Traversals- Recursion. Graph - Definition, Types of Graphs, Graph Traversal –Dijkstras shortest path- DFS and BFS.

Text Books

1. Mastering in C++, K.R.Venugopal, Raj Kumar, T.Ravisankar – McGraw Hill, 2011.
2. C++ Plus Data Structure by Nell Dale, Narosa Publications, 2000

Reference Books:

1. Reema Thareja, Object Oriented Programming with C++, Oxford University Press, 2015
2. Balagurusamy, C++ programming, TMH.
3. Fundamentals of Data Structures in C++ by Ellis Horowitz, Sartaj Sahni and Dinesh Mehtha, Second Edition, University Press
4. Data Structures using C++ by Varsha H.Patil. Oxford University Press, 2012

PRACTICAL – II
C++ & DATA STRUCTURE - LAB

1. Implementing classes, object, constructors and member functions for calculating area and perimeter of a circle.
2. Implementing function overloading (Find area/volume of rectangle, circle, sphere, cylinder, cone etc).
3. Implementing operator over loading(Addition, subtraction, multiplication of matrices)
4. Implementing single, multiple, hierarchical inheritance.
5. Implementing sequential file operations using error handling functions.
6. Implementing PUSH, POP operations of stack using Arrays.
7. Implementing add, delete operations of a queue using Arrays.
8. Implementing Infix to postfix conversion of an expression using stack
9. Implementing Binary search tree recursive traversals (in-order, pre-order, post-order).
10. Implementing Polynomial addition using linked list.

ALLIED - 2

1. MATHEMATICS – II

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume - Fourier series for functions in $(0, 2\pi)$ and $(-\pi, \pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Gauss, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
3. P.R.Vittal(2003). *Allied Mathematics* .Marghan Publications, Chennai.
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai

2. MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermitian, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

- (i) Cramer's rule.
- (ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

$$\frac{1}{ax^2+bx+c}, \frac{1}{\sqrt{ax^2+bx+c}}, \frac{px+q}{ax^2+bx+c}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \frac{px+q}{ax^2+bx+c}$$

integrations using simple substitutions integrations involving trigonometric functions of the form

$$\frac{1}{a+b\cos x}, \frac{1}{a^2\sin^2 x + b^2\cos^2 x}, \text{ Integration by parts.}$$

UNIT-IV

Properties of definite integrals. Reduction formulae for

$\int x^n e^{ax} dx$, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane curves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram & Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian & Others, Analytical Geometry 3 Dimension – Emerald publication 1992 Reprint.
4. Manicavachagompillay & Natarajan. Analytical Geometry part II - three Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER III
CORE THEORY PAPER – 3
JAVA Programming

Objectives:

To improve Object Oriented Programming gathered already through an independent platform.

Unit – I: BASICS, ESSENTIALS, CONTROL STATEMENT AND CLASSES & OBJECTS

Computer and its Languages – Stage, Origin and Features for Java - JDK–OOP; Java Essentials: Program – API - Variables& Literals - Data Types - String Class – Operators - Type conversion - Constants - Scope – Comments - Keyboard Input; Control Statements: Conditional Statements – Looping Statements - Break and Continue Statements; Classes and Objects: Modifiers - Arguments - Constructors - Packages and import - Static Class - Overloaded Methods and Constructors - Returning Objects – to String() - this reference –Enumeration - Garbage Collection.

Unit – II: ARRAYS, INHERITANCE, INTERFACES AND PACKAGES

Arrays - Three or More Dimensions; Inheritance: Basics - Calling the Super class Constructor - Overriding Super class Methods - Inheritance from Subclasses – Polymorphism -Abstract Classes and Methods - Interfaces: Fields - Multiple inheritance - Interface inheritance; Packages: Creating packages – Accessing package from other packages- Access Specifier.

Unit – III: STRING HANDLING, EXCEPTION HANDLING AND MULTI THREADING

String Handling: Basics - Operations –String Methods - String Buffer class - String Builder – to String method -String Tokenizer class. Exception Basics: try and catch block - Multiple catch block - Nested try - throws keyword - Throw vs Throws - Final Vs Finally Vs Finalize - Method Overriding - Custom Exception - Multithreading: Life Cycle - Methods in Thread - thread application – Thread priority – Synchronization - Inter-thread communication - Suspending, Resuming, and Stopping Threads;

Unit – IV: APPLLET AND GUI APPLICATION

Applets: Basis - Lifecycle - Applet classes - Application – Graphics; AWT-I: GUI Programming - AWT classes - Windows fundamentals- Creating Windows - Dialog Boxes - Layout Managers - Radio Buttons and Check Boxes – Borders-Swing

Unit – V: JAVA DATABASE CONNECTIVITY

JDBC - Types of Drivers- Architecture- Classes and Interfaces - Developing JDBC Application - New Database and Table with JDBC - Working with Database Metadata.

Text Book

1. S.Sagayaraj, R.Denis, P.Karthik & D.Gajalakshmi, “Java Programming“, Universities Press, 2017

References

1. Patrick Naughton and Herbert Schildt. “The Complete Reference JAVA 2”. 3rd Edition. Tata McGraw-Hill Edition, 1999.
2. Muthu C. “Programming with JAVA”. 2nd Edition. Vijay Nicole Imprints, 2011.
3. Ken Arnold Gosling and Davis Holmen. “The Java Programming Language”. 3rd Edition. Addition Wesley Publication.

Core Practical

Practical 3- JAVA Programming LAB

List of Practical's

1. Implementing Package, inheritances and interfaces
2. Implementing Flow, Border and Grid Layouts
3. Implementing Dialogs , Menu and Frame
4. Implementing User defined Exception Handling
5. Implementing Multithreading
6. Implementing I/O Stream File handling
7. Implementing a Calculator using Swing
8. CRUD operation Using JDBC
9. Client Server using TCP and UDP Socket
- 10. GUI application with JDBC**

ALLIED - 3

1. PHYSICS - I

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak,Cambridge,University Press(1999).

ALLIED

2. STATISTICAL METHODS AND THEIR APPLICATIONS I

Objective

To understand and computing statistical Methods by which to develop the programming Skills.

UNIT-I

Introduction - scope and limitations of statistical methods - classification of data - Tabulation of data - Diagrammatic and Graphical representation of data - Graphical determination of Quartiles ,Deciles and Percentiles.

UNIT-II

Measures of location : Arithmetic mean, median, mode, geometric mean and Harmonic mean and their properties.

UNIT-III

Measures of dispersion : Range, Quartile deviation, mean deviation, Standard deviation, combined Standard deviation, and their relative measures.

UNIT-IV

Measures of Skewness Karl Pearson's, Bowley's, and kelly's and co-efficient of Skewness and kurtosis based on moments.

UNIT-V

Correlation - Karl Pearson - Spearman's Rank correlation - concurrent deviation methods.

Regression Analysis: Simple Regression Equations.

Note : The proportion between theory and problems shall be 20:80

Books for Reference:

1. Fundamental of Mathematical Statistics - S.C. Gupta & V.K. Kapoor - Sultan Chand
2. Statistical Methods - Snedecor G.W. & Cochran W.G. oxford & +DII
3. Elements of Statistics - Mode . E.B. - Prentice Hall
4. Statistical Methods - Dr. S.P. Gupta - Sultan Chand & Sons

Skill Based Subject –Paper 1

DESIGN AND ANALYSIS OF ALGORITHMS

Objective: To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT -I: ALGORITHM AND ANALYSIS

What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms.

UNIT - II: DIVIDE AND CONQUER

General Method - Binary Search - Finding the Maximum and Minimum-Merge Sort - Quick Sort - Selection Sort- Stassen's Matrix Multiplications.

UNIT - III: THE GREEDY METHOD

The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines - Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.

UNIT - IV: DYNAMIC PROGRAMMING

The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem

UNIT - V: TRAVERSAL, SEARCHING & BACKTRACKING

Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-Queens Problem – Sum of Subsets- Graph Colouring- Hamiltonian Cycles

TEXT BOOK

Fundamentals of Computer Algorithms, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Galgotia Publications, 2015.

REFERENCE BOOKS:

1. Introduction to Algorithms, Cormen T.H., Leiserson C.E. and Rivest R.L., PHI 1998.
2. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education, 2nd Edition.

Non- Major Elective-1 Paper-1
Introduction to Information Technology

Objectives:

To enable the student to be proficient with Information Technology with a better knowledge of Computer

UNIT – I Introduction to Computers:

Definition - Characteristics of a Computer - Classification of Computers - Basic Anatomy of the Computer - Applications / Uses of Computers in different fields

UNIT – II Input and Output Devices:

Input Devices - Output Devices - Data Representation - Programming Languages / Computer Languages - Software: System Software - Application Software

UNIT – III Data Communication and Computer Networks:

Data Communication - Computer Network - The Uses of a Network - Types of Networks - Network Topologies- Transmission Media: Guided Transmission Media - Wireless Transmission

UNIT – IV Internet and its Applications:

History of Internet - Uses of Internet - Advantages of Internet - ISP - Internet Services - IP Address - Web Browser - URL - DNS - Internet Explorer - Types of internet connections - E-mail - Search Engine.

UNIT – V Operating System:

Evolution of operating systems - Function of Operating System - Classification of Operating –System - Example of Operating System – DOS –Windows – UNIX - Linux

TEXT BOOKS:

1. Alexis Leon and Mathews Leon, “Fundamentals of Information Technology”, Vikas Publishing House Pvt. Ltd.
2. Introduction to Information Technology, P.Rizwan Ahmed, Second Edition, Margham Publications, 2016
3. Introduction to Information Technology, PelinAksoy, Laura DeNardis, Cengage Learning India Private Limited.

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SEMESTER IV
CORE THEORY PAPER – 4
DATABASE MANAGEMENT SYSTEM

Objective: To incorporate a strong knowledge on databases to students

UNIT - I Database Basics

Introduction: Flat File – Database System – Database – Actionable for DBA. The Entity – Relationship Model: Introduction – The Entity Relationship Model. Data Models: Introduction – Relational Approach – The Hierarchical Approach – The Network Approach.

UNIT – II Relational Algebra

Structure of Relational Databases – Fundamental Relational Algebra Operations – Additional Relational Algebra Operations - Extended Relational Algebra Operations - Null Values - Modification of the Database - The Tuple Relational Calculus – The Domain Relational Calculus

UNIT – III Normalization

Normalization: Introduction - Normalization – Definition of Functional Dependence (FD) – Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT – IV Structured Query Language

Structured Query Language: Features of SQL – Select SQL Operations – Grouping the Output of the Query – Querying from Multiple Tables – Retrieval Using Set operators – Nested Queries. T-SQL – Triggers and Dynamic Execution: Transact-SQL..

UNIT – V Procedural Language

Procedural Language- SQL: PL/SQL Block Structure – PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor – Processing Explicit Cursor – Implicit Cursor – Exception Handlers – Sub Programs in PL/SQL – Functions – Precaution While Using PL/SQL Functions – Stored Procedure – Object Oriented Technology.

Text Book

1. Rajesh Narang, “Database Management Systems”, PHI Learning Private Limited, New Delhi, sixth printing, 2010.

Reference

1. S.K. Singh, “Database Systems – Concepts, Design and Applications”, Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008
2. Database System Concepts , Abraham Silberchatz, Henry F Korth , S.Sudarshan, McGraw-Hill - 5th Edition - 2006.

Core Practical

Practical 4- RDBMS LAB

1. Table creation and simple Queries
2. Queries using Aggregate Function and Set Operations
3. Table creation with various Joins
4. Nested Sub queries and correlated Sub queries
5. View creation and manipulation
6. PL/SQL program for cursor
7. PL/SQL program for packages
8. PL/SQL program for triggers and its type
9. PL/SQL program for procedures and functions

ALLIED - 2

1. PHYSICS II

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davission and Germer's Experiment – G.P. Thomson's Experiment – Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell –Bravais lattice- structures of simple cubic-BCC and FCC- co ordination number, packing factor calculation for the above structures –Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology–limitations.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
9. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
10. Renewable & Sustainable energy sources – Agarwal.

ALLIED

2. STATISTICAL METHODS AND THEIR APPLICATIONS II

Objective

To understand and computing statistical Methods by which to develop the programming Skills.

UNIT-I

Curve fitting by the methods of least squares -

$$Y = a x + b, Y = a x^2 + b x + c, Y = a x^b, Y = a e^{bx}$$

UNIT-II

Sample Space - events - probability - Addition and Multiplication Theorem - conditional probability - Baye's Theorem. Mathematical expectation Addition and Multiplication theorem, Chebychev's Inequality.

UNIT-III

Standard distributions - Binomial, Poisson, Normal distribution and fitting of these distributions.

UNIT-IV

Test of Significance- small sample and large sample test based on mean, S.D. correlation and proportion - confidence interval.

UNIT-V

Analysis of variance - One and Two way classifications - Basic principle of design of Experiments - Randomisation, Replication and Local control - C.R.D., R.B.D. and L.S.D.

Books for Reference:

1. Fundamental of Mathematical Statistics - S.C. Gupta & V.K. Kapoor - Sultan Chand
2. Fundamental of Applied Statistics - S.C. Gupta & V.K. Kapoor – Sultan Chand
3. Statistical Methods - Snedecor G.W. & Cochran W.G. oxford & +DII
4. Elements of Statistics - Mode . E.B. – Prentice Hall

ALLIED PRACTICAL

1. PHYSICS

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Rigidity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
8. Sonometer – frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer Grating – Minimum Deviation – Mercury Lines.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT by transistors.
18. Zener diode – Voltage Regulation.
19. NAND / NOR as universal gate.
20. Demorgan's theorem verification.

ALLIED PRACTICAL

2. STATISTICAL METHODS AND THEIR APPLICATIONS - Practical

ALLIED PRACTICAL

1. Formation of uni-variate and bi-variate frequency distribution
2. Diagrams and Graphs
3. Measures of Location
4. Measures of Dispersion
5. Skewness and Kurtosis
6. Correlation and Regression
7. Curve Fitting : $y = ax+b$, $y=ax^2+bx+c$, $y=ax^b$, $y=ae^{bx}$
8. Fitting of distributions - Binomial, Poisson, Normal
9. Test of significance small sample and large sample tests
10. Analysis of Variance: one way classification, Two way classification and Design of Experiments - C.R.D, R.B.D & L.S.D

BOOKS FOR REFERENCE:

1. Statistical Methods by S.P. Gupta, Sultan chand & Sons
2. Fundamental of Applied Statistics - S.C. Gupta & V.K. Kapoor

Note:

Use of Scientific Calculator shall be permitted for Practical Examination. Statistical Table may be provided to the students at the Examination Hall.

Skill Based Subject II –Paper 2
Computer Organisation and Architecture

Objective: To enable the student to have a better understanding of architecture of computer and prepare the student for higher level of programming

UNIT - I

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions – Input-Output and Interrupts.

UNIT - II

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT - III

Introduction – General Register Organization – Instruction Formats – Addressing Modes.

UNIT – IV

Peripheral Devices – I/O interface – Asynchronous Data Transfer – Modes of Transfer - Direct Memory Access – Input Output Processor (Excluding IBM and Intel IOPs).

UNIT - V

Auxiliary Memory – Main Memory – Auxiliary Memory - Associative Memory – Cache Memory -Virtual Memory.

TEXT BOOK

1. Morris Mano M. Computer System Architecture. New Delhi :Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings . Computer Organization and Architecture. 8th edition. Pearson publication, 2010
2. Morris Mano. Digital Logic and Computer Design. New Delhi :Prentice Hall of India Private Limited, 2001

NON MAJOR ELECTIVE II PAPER II

INTERNET AND ITS APPLICATIONS

Objective: To equip students to basics of Internet usage and prepare them for digital world

UNIT - I Internet Basics

Introduction to Computers Programming Language types History of Internet
Personal computers History of World Wide Web- Micro software .NET Java-Web
resources.

UNIT - II Web Browsers

Web Browsers - Internet Explorer - connecting to Internet Features of Internet
explorer6 Searching the Internet- online help and tutorials - File Transmission Protocol
(FTP) Browser settings.

UNIT - III E-Mail

Attaching a file, Electronic mail creating an E-mail id sending and Receiving
mails - attaching a file - Instance messaging - other web browsers.

UNIT - IV HTML

Introduction to HTML headers – Linking - Images-special characters and line
breaks unordered lists- simple HTML programs.

UNIT - V Digital Cash

E-marketing consumer tracking Electronic advertising search engine – CRM -
credit card payments Digital cash and e-wallets micro payments- smart card

Text book

Internet and World Wide Web Third edition H.M.Deitel, P.J. Deitel and
A.B.Goldberg - PHI Reference

The Internet- Complete Reference Harley hahn, Tata McGraw Hill

SEMESTER V

CORE THEORY PAPER – 5

MOBILE APPLICATIONS DEVELOPMENT

Objective:

This course aims to provide the students with a detailed knowledge on Mobile Application and Development and covers Android programming from fundamentals to building mobile applications for smart gadgets.

UNIT I Introduction to Mobile Applications:

Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android — Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT II Android development:

Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT III Android Services:

Simple services – Binding and Querying the service – Executing services.- Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT IV Android User Interface:

Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert dialogs-Spinners-rating bar-progress bar.

UNIT V Publishing and Internationalizing mobile applications :

Live mobile application development: Game, Clock, Calendar, Convertor, Phone book. App Deployment and Testing: Doodlz app – Tip calculator app – Weather viewer app.

Text Books

Barry Burd, “Android Application Development – All-in-one for Dummies”, 2nd Edition, Wiley India, 2016.

Reference:

1. Paul Deitel, Harvey Deitel, Alexander Wald, “ Android 6 for Programmers – An App-driven Approach”, 3rd edition, Pearson education, 2016.
2. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGraw Hill Education, 8th reprint, 2015.
3. <http://www.developer.android.com>

OPERATING SYSTEM

Objective: Enable the student to get sufficient knowledge on various system resources.

Unit – I Operating System Basics

Basic Concepts of Operating System - Services of Operating System-Classification of Operating System- Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

Unit –II Operating System Scheduling

CPU Scheduling: Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling;-Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock- Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

Unit- III Memory management

Memory Management - Basic Concept of Memory - Address Binding; Logical and Physical Address Space- Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

Unit – IV Swapping

Swapping- Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory- Demand Paging - Transaction Look aside Buffer (TLB) - Inverted Page Table- Page Replacement Algorithms

Unit –V File Management

File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

Text Books:

Abraham Silberschatz Peter B. Galvin, G. Gagne, “Operating System Concepts”, Sixth Edition, Addison Wesley Publishing Co., 2003.

Reference

1. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson
2. Willam-Stalling “Operating System” Fourth Edition, Pearson Education, 2003.

CORE THEORY PAPER – 7

DATA COMMUNICATION & NETWORKS

Objective:

To equip students to basics of Data Communication and prepare them for better computer networking

UNIT I

Introductory Concepts - Network hardware - Network software – Network Architecture - Physical layer - Guided transmission media - Cable television.

UNIT II

Data Link Layer - Design issues - Channel allocation problem - Multiple access protocols - Ethernet - Wireless LAN - 802.11 architecture.

UNIT III

Network Layer : Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.

UNIT IV

Transport Layer - Transport service - Elements of transport protocols - User Datagram Protocol - Transmission Control Protocol.

UNIT V

Application Layer - DNS - Electronic mail - World Wide Web - Multimedia - Network security.

TEXT BOOK

1. Tannenbaum, A.S., 2003 : Computer Networks, Prentice Hall.

REFERENCES

1. Stallings, William, 2008: Local and Metropolis Area Networks: An Introduction, Macmillan Publishing Co.
2. Black: Data Network, Prentice Hall of India.
3. W. Stallings, "Data and Computer Communication", Pearson Education, Fifth Edition, 2001

Mobile Applications Development – Lab

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation
11. Grid View
12. Internal Storage - Files
13. SQLite - Database
14. Google Map
15. Permissions

Core Practical – 6
Operating System Lab

1. Implementing the Process system calls.
2. Implementing I/O system calls.
3. Implementing IPC using message queues.
4. Implementing CPU& scheduling algorithm for first come first serve scheduling.
5. Implementing CPU scheduling algorithm for shortest job first scheduling.
6. Implementing perform priority scheduling.
7. Implementing CPU scheduling for Round Robin Scheduling.
8. Implementing pipe processing.
9. Implementing first fit, best fit algorithm for memory management.
10. A program to simulate producer-consumer problem using semaphores.
11. A Shell Program to find factorial of a given number
12. A shell program to generate Fibonacci number

Elective – 1 Paper – 1

A. DATA MINING

Objective: Enable the student to get sufficient knowledge on various system resources.

UNIT - I: Data Mining Basics

Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT - II: Data Models

Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Meta Data.

UNIT - III: Data Editing

Data Pre-Processing and Characterization: Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT - IV: Classification

Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT - V: Analysis

Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

TEXT BOOKS:

1. PaulrajPonnaiah, “Data Warehousing Fundamentals”, Wiley Publishers, 2001.
2. Jiawei Han, MichelineKamber, “Data Mining: Concepts and Techniques”,Morgan Kaufman Publishers, 2006.

REFERENCES:

1. Usama M. Fayyad, Gregory Piatetsky Shapiro, Padhraí Smyth, Ramasamy Uthurusamy, "Advances in Knowledge Discover and Data Mining", the M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002
3. Alex Berson, Stephen Smith, Kurt Thearling, "Building Data Mining Applications for CRM", Tata McGraw Hill, 2000.
4. Margaret Dunham, "Data Mining: Introductory and Advanced Topics", Prentice Hall, 2002.
5. Daniel T. Larose John Wiley & Sons, Hoboken, "Discovering Knowledge in Data: An Introduction to Data Mining", New Jersey, 2004

B. COMPUTER GRAPHICS

Objectives: To equip students to basics of computer drawing and prepare them for computer modelling of objects

UNIT – I : OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES

Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Deices- Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms

UNIT – II : ATTRIBUTES AND TWO DIMESIONAL TRANSFORMATIONS

Line Attributes- Curve Attributes-Color And Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation

UNIT – III : TWO DIMENSIONAL VIEWING AND CLIPPING

The Viewing Pipeline- Window To Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky-Sutherland Hodgeman Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification Of Input Devices- Interactive Picture Construction

UNIT – IV : THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING

Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -

UNIT – V : VISIBLE SURFACE DETECTION METHODS

Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method -Area Sub Division Method - Octree Methods - Ray Casting Method

TEXT BOOK:

Computer Graphics(C version) , Donald Hearn and M.Pauline Baker, Pearson- 2nd Edit. 2012.

REFERENCE BOOKS:

1. Interactive Computer Graphics—A top down approach using Open GL, Edward Angel , Pearson, 5th Edition.
2. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning, Indian Edition,2009

C. INFORMATION SECURITY

Objective: To enable the student to understand various methodology available for securing information

UNIT I Information Security Basics

INTRODUCTION -History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II Security Investigation

SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III Security Analysis

SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV Security Models

LOGICAL DESIGN-Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V Security Physical Design

PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

Text Book

1. Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2003

Reference

1. Micki Krause, Harold F. Tipton, “ Handbook of Information Security Management”, Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGraw-Hill, 2003
3. Matt Bishop, “Computer Security Art and Science”, Pearson/PHI, 2002.

Skill Based Subject 3 Paper – 3

SOFTWARE ENGINEERING

Objective:

This course introduces the concepts and methods required for the construction of large software intensive systems.

UNIT-I:

Introduction - Evolving Role of Software - Changing Nature of Software – Software Myths; A Generic View of Process: Layered Technology - Process Models: Waterfall Model - Evolutionary Process Models.

UNIT-II:

Requirements Engineering: Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modelling Concepts.

UNIT-III:

Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model Creating an Architectural Design: Software Architecture - Data Design - Architectural Design - Mapping Data Flow into Software Architecture; Performing User Interface Design: Golden Rules.

UNIT-IV:

Testing Strategies: Strategic Approach to Software Testing- Test Strategies for Conventional and Object Oriented Software - Validation Testing - System Testing -Art of Debugging. Testing Tactics: Fundamentals - White Box- Basis Path - Control Structure - Black Box Testing Methods

UNIT-V:

Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation - Project Scheduling - Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

TEXT BOOK:

Roger S Pressman, "Software Engineering - A Practitioner's Approach", Sixth Edition, McGraw Hill International Edition, New York: 2005.

REFERENCES:

1. Ian Sommerville, "Software Engineering", 7th Edition, Pearson Education, 2006.
2. Mall Rajib, "Software Engineering", 2/E, PHI, 2006.

SEMESTER VI

CORE THEORY PAPER – 8

CLOUD COMPUTING

Objective:

To enable the students to learn the basic functions, principles and concepts of cloud Systems.

UNIT I: UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT II: DEVELOPING CLOUD SERVICES

Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III: CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events.

UNIT IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT V: SECURITY IN THE CLOUD

Security Overview - Cloud Security Challenges and Risks - Software-as-a-Service Security- Security Governance - Risk Management - Security Monitoring - Security Architecture Design - Data Security - Application Security - Virtual Machine Security - Identity Management and Access Control - Autonomic Security.

TEXT BOOK:

1. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.
4. Kumar Saurabh, “Cloud Computing – insights into New-Era Infrastructure”, Wiley India, 2011.
5. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud” O'Reilly

CORE THEORY PAPER – 9

OPEN SOURCE PROGRAMMING

Objective:

To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, CSS and Linux

UNIT I: INTRODUCTION TO HTML 5, JAVA SCRIPT, PHP AND CSS

Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas -The HTML5 Canvas- HTML5 Audio and Video- Introduction to CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors.

UNIT-II: LINUX

Introduction : Linux Essential Commands – File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNI- III: MYSQL

Introduction to MY SQL – The show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative detail – Table Joins – Loading and Dumping a Database.

UNIT-IV: PHP

PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control -statement – Array – Functions.

UNIT – V PHP

Basic Form Processing – File and Folder Access – Cooking – Sessions – Database Access with PHP – MySQL - MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

Text Books

1. “Learning PHP, MySQL, Java Script, CSS and HTML5”, Robin Nixon, O’Reilly Publications, 3rd Edition, 2014.
2. Steven Holzner, “HTML Black Book”, Dreamtech Press &Paraglyph Press Publishers, 2007

Reference Books

Open Source Software, P.Rizwan Ahmed, Margham Publication, Chennai, 2015

Core Practical
PRACTICAL – VII
ASP.NET Lab

1. Implement Validation Controls
2. Write a Program to implement ad rotator control
3. Write a Program to implement state management techniques
4. Write a Program to implement view State and Session State.
5. Write a Program to displaying data with the grid view
6. Write a Program to implement ASP.Net Server Side Controls.
7. Write a Program to implement ASP.Net Master Pages, Themes and Skins.
8. Write a Program working with forms using ASP.Net
9. Write a Program working with pages using ASP.Net.
10. Write a Program to access data sources through ADO.NET

Core Practical
PRACTICAL – VIII
Open Source Programming Lab

1. Create a web page with Frames and Tables.
2. Create a web page incorporating CSS (Cascading Style Sheets)
3. Write a shell program to find the factorial of an integer positive number
4. Write a shell program for checking whether a given string is a palindrome or not.
5. Create a simple calculator in Java script.
6. Write a JavaScript program to scroll your name in the scroll bar.
7. Develop a program and check message passing mechanism between pages.
8. Develop a program and check file system functions, date & time functions.
9. Create a student database table in MYSQL and manipulate records (insert, delete, update) records in a web browser.
10. Develop a program using cookies and session.

Elective II PAPER – 2

(A) SOFTWARE TESTING

Objective: To make the student more proficient with error free software development

UNIT-I PRINCIPLES OF TESTING

A test in time - The cat and the saint - Test the tests first - The Policemen on the bridge - Phase of software project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation - Process model to represent different phases - Life cycle models.

UNIT-II BLACK BOX AND WHITE BOX TESTING

White box testing - Challenges - Static testing - Structural testing - Black box testing.

UNIT-III INTEGRATION, SYSTEM AND ACCEPTANCE TESTING

Integration testing - Types - Phase of testing - Scenario testing - Defect bash - System and Acceptance testing: Overview - Functional vs. Non-Functional testing - Functional system testing - Non-functional testing-Acceptance testing.

UNIT-IV PERFORMANCE AND REGRESSION TESTING

Introduction - Factors Governing - Methodology for Performance testing - Tools and Process for Performance Testing - Regression Testing - Types of Regression testing - How to do Regression Testing?

UNIT-V INTERNATIONALIZATION AND ADHOC TESTING

Introduction to Internationalization - Primer on Internationalization - Test phases for Internationalization testing - Enabling testing - Locale testing - Internationalization Validation- Fake language testing - Language testing - Localization testing - Tools used for Internationalization - Challenges and Issues - Overview of Ad Hoc testing - Buddy, Pair, Exploratory, Iterative, Agile and Extreme Testing - Defect Seeding.

TEXT BOOK:

1. Srinivasan Desikan, Gopalaswamy Ramesh, “Software Testing: Principles and Practices”, Pearson Publications, 2006.

REFERENCES:

1. Renu Rajani, Pradeep Oak, “Software Testing- Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
2. Boris Beizer, “Software Testing Techniques”, Dream Tech Press, Second Edition, 2003.

(B) MOBILE COMPUTING

Objective: To impart good knowledge of wireless communication to students

UNIT I : WIRELESS COMMUNICATION FUNDAMENTALS

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II : TELE COMMUNICATION NETWORKS & WIRELESS LAN

Telecommunication systems – GSM – GPRS - Satellite Networks ,Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a -802.11b standards – HIPERLAN – Blue Tooth.

UNIT III: MOBILE NETWORK LAYER & TRANSPORT LAYER

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics. Traditional TCP, Mobile TCP

UNIT IV: APPLICATION LAYER

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts

UNIT V: DATABASE ISSUES

Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCE BOOKS:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, 2003..

(C)MICROPROCESSORS AND ITS APPLICATIONS

Objective:

To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.

Unit-I: 8085 MICROPROCESSOR AND ARCHITECTURE

Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts

Unit II: PROGRAMMING THE 8085

Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions

Unit-III: 8086 MICROPROCESSOR AND ARCHITECTURE

Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes.

Unit-IV: PROGRAMMING THE 8086

8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives

Unit-V: INTERFACING PERIPHERALS

8255 PPI , 8253/8254 PIT, 8237 DMAC,8259 PIC, 8251 USART.

TEXT BOOK

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S. Gaonkar, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I,II and V)
2. Microprocessors and Interfacing, Douglas V. Hall, Tata McGraw Hill, 2nd Ed. (for Units III and IV)

REFERENCE BOOKS:

1. Assembly Language Programming the IBM PC ,Alan R. Miller, SubexInc, 1987.
2. Advanced Microprocessors and Peripherals, Ray A K ,Bhurchandi K M , TMH.

Elective III PAPER – 3

(A) Internet of Things

Objective: To prepare the student for better application of internet technology.

Unit – I IoT Introduction

Introduction to Internet of Things: Definition – Characteristics of IOT – Physical Design of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – Iot Functional Blocks – IoT Communication Models – IoT Communication APIs – IoT Enabling Technologies

Unit – II Domain Specific IoT - 1

Domain Specific IoT – I : Smart Lighting – Smart Appliances – Intrusion Detection – Smoke / Gas Detection – Smart Parking – Smart Roads – Structural Health Monitoring – Surveillance – Emergency Response – Weather Monitoring –

Unit – III Domain Specific IoT II

Domain Specific IoT – II : Air Pollution Monitoring – Noise Pollution Monitoring – Forest Fire Detection – River Flood Detection – Smart Grids- Smart Vending Machines – Route Generation & Scheduling – Fleet Tracking – Shipment Monitoring –

Unit – IV Domain Specific IoT III

Domain Specific IoT – III: Remote Vehicle Diagnostics – Smart Irrigation - Green House Control – Machine Diagnosis & Prognosis – Indoor Air Quality Monitoring – Health & Fitness Monitoring – Wearable Electronics

Unit – V IoT and M2M

IoT And M2M: M2M – Difference Between Iot And M2M – SDN And NFV For IoT – IoT System Management With NETCONF – YANG : Need For Iot Systems Management – SNMP- Network Operator Requirements – NETCONF – YANG-IoT Systems Management With NETCONF - YANG

Text Books:

1. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam

Dunkels, Morgan Kuffmann.

Reference

1. Internet of Things, P.Rizwan Ahmed, Margham Publications, Chennai.
2. Designing the Internet of Things, Adrian McEwen (Author), Hakim Cassimally

(B) System Software

Objective: To make the student to become more proficient with system programming

Unit – I LANGUAGE PROCESSORS

Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

UNIT II ASSEMBLERS AND MACRO

Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

UNIT III COMPILER I

Scanning: Finite State Automate – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

UNIT IV COMPILER II AND INTERPRETERS

Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

UNIT V LINKERS

Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

TEXT BOOK

D.M. Dhamdhere, “System Programming And Operating Systems”, New Delhi: Tata McGraw-Hill Publishing Company Limited, 1993.

(C) Multimedia Systems

Objective :

This course presents the Introduction to Multimedia, Images & Animation and enable the students to learn the concepts of Multimedia.

UNIT I Introduction to Multimedia:

Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools Sound and Graphics : Digital Sound – Editing and Mixing sound files – MIDI creation – Tracking Procedure – Interactive and Non Interactive Graphics – High Resolution Graphics – Difference between TV and Computer Display.

UNIT II Video and Animation:

Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing and Warping – Two Dimensional and Three dimensional animation – Animation Tools – Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking System – Motion Capturing System.

UNIT III Creating Presentation:

Script Writing and creating interactive and non-interactive presentation – Linear and Non Linear Editing – Authoring Tools – File Formates SOUND, VIDEO, ANIMATION, Presentation Images. Multimedia Programming: Text Links – Hyper Text system – Form Creation – File storing - Error Trapping.

UNIT IV Sound Links:

Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE, MIDI file processing. Animation: Color Palette – Events – ROPs.

UNIT V Imaging Special Visual Effects:

Bitmap – Brushes – Dissolve –Hotspot Editor – Scrolling. Media Control Interface: Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

Text Books :

1. Kaliyaperumal Karthikeyan, “Introduction to Multimedia System”, LAP Lambert Academic Publishing, 2011
2. TayVaughan, “Multimedia Making It Work Eighth Edition”, Tata McGraw-Hill Publishing Company, 2011
3. ParagHavaladarand Gerald Medioni, “Multimedia Systems”, Cengage Learning, 2011
4. S. K. Bansal, “Multimedia Systems”, Aph Publishing Corporation, 2011

Skilled Based Subject IV

ASP .NET

UNIT I : ASP.NET Basics

Introduction to ASP.NET: .NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle. Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

UNIT II: Form

Form validation: Client side validation, Server side validation, Validation Controls: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control. State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State.

UNIT III: ADO.NET

Architecture of ADO .NET, Connected and Disconnected Database, Create Database, Create connection Using ADO.NET Object model, Connection Class, Command Class, Data Adapter Class, Dataset Class, Display data on data bound controls and Data Grid.

UNIT IV: Database accessing

Database accessing on Web Applications: Data Binding Concept with web, Creating Data Grid, Binding standard web server controls, Display data on web form using Data Bound Controls.

UNIT V: XML

Writing Datasets to XML, Reading datasets with XML. WEB services: Remote method call using XML, SOAP, Web service description language, Building and Consuming a web service, Web Application deployment.

Textbook:

Professional ASP.NET 1.1 Bill Evjen , Devin Rader , Farhan Muhammad, Scott Hanselman , Srivakumar

REFERENCE BOOKS:

1. Introducing Microsoft ASP .NET 2.0 Esposito PHI
2. Professional ADO.NET BipinJoshi,Donny Mack, Doug Seven , Fabio Claudio Ferracchiati, Jan D NarkiewiczWrox
3. Special Edition Using ASP.NET Richard Leineker Person Education
4. The Complete Reference ASP.NET Matthew MacDonald TMH
5. ASP.NET Black Book Dream Tech

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SCIENCE

B.Sc. PHYSICS

DEGREE COURSE

CBCS PATTERN

(With effect from 2017 – 2018)

The Course of Study and the Scheme of Examinations

| S. NO. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|-----------------------|-------------|----------------|--------|---|---------------|-----------|-------|
| | | Course Title | | | | | | | |
| SEMESTER I | | | | | | | CIA | Uni. Exam | Total |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 6 | Properties of Matter and Acoustics | 25 | 75 | 100 |
| | III | Core Practical | Practical-1 | 3 | 0 | | 0 | 0 | 0 |
| 4 | III | Allied-1 | Paper-1 | 4 | 4 | Chemistry I or Biochemistry I | 25 | 75 | 100 |
| | IV | Allied Practical | Practical-1 | 3 | 0 | | 0 | 0 | 0 |
| 5 | IV | Environmental Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| | | | | 30 | 20 | | 125 | 375 | 500 |
| | | | | | | | | | |
| SEMESTER II | | | | | | | CIA | Uni. Exam | Total |
| 8 | I | Language | Paper-2 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 9 | II | English | Paper-2 | 4 | 4 | English | 25 | 75 | 100 |
| 10 | III | Core Theory | Paper-2 | 6 | 5 | Thermal Physics and Statistical Methods | 25 | 75 | 100 |
| 11 | III | Core Practical | Practical-1 | 3 | 3 | Any 16 Experiments given in syllabus | 25 | 75 | 100 |
| 12 | III | Allied-1 | Paper-2 | 4 | 4 | Chemistry II or Biochemistry II | 25 | 75 | 100 |
| 13 | IV | Allied Practical | Practical-1 | 3 | 2 | | 25 | 75 | 100 |
| 14 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 15 | IV | Soft Skill | | 2 | 1 | Soft Skills | 25 | 75 | 100 |
| | | | | 30 | 25 | | 200 | 600 | 800 |

| S. NO. | Part | Study Components | | Ins. Hrs /week | Credit | Title of the Paper | | Maximum Marks | |
|--------------|------|-------------------------|-------------|----------------|--------|---------------------------------------|-----|---------------|-------|
| | | Course Title | | | | | | | |
| | | | | | | | | | |
| SEMESTER III | | | | | | | CIA | Uni. Exam | Total |
| 16 | I | Language | Paper-3 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 17 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 18 | III | Core Theory | Paper-3 | 3 | 3 | Electricity and magnetism | 25 | 75 | 100 |
| 19 | III | Core Practical | Practical-2 | 3 | 0 | | 0 | 0 | 0 |
| 20 | III | Allied-2 | Paper-3 | 7 | 4 | Mathematics I | 25 | 75 | 100 |
| 22 | IV | Skill Based Subject | Paper-1 | 3 | 3 | Electrical Appliances | 25 | 75 | 100 |
| 23 | IV | Non-Major Elective | Paper-1 | 2 | 2 | Renewable Energy Sources | 25 | 75 | 100 |
| | | | | 30 | 20 | | 150 | 450 | 600 |
| | | | | | | | | | |
| SEMESTER IV | | | | | | | CIA | Uni. Exam | Total |
| 24 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 25 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 26 | III | Core Theory | Paper-4 | 3 | 3 | Mechanics | 25 | 75 | 100 |
| 27 | III | Core Practical | Practical-2 | 3 | 3 | Any 16 Experiments given in syllabus | 25 | 75 | 100 |
| 28 | III | Allied-2 | Paper-4 | 7 | 6 | Mathematics II | 25 | 75 | 100 |
| 30 | IV | Skill Based Subject | Paper-2 | 3 | 3 | Electronics Appliances | 25 | 75 | 100 |
| 31 | IV | Non-Major Elective | Paper-2 | 2 | 2 | Basic Physics | 25 | 75 | 100 |
| | | | | 30 | 25 | | 175 | 525 | 700 |
| SEMESTER V | | | | | | | CIA | Uni. Exam | Total |
| 32 | III | Core Theory | Paper-5 | 6 | 6 | Optics | 25 | 75 | 100 |
| 33 | III | Core Theory | Paper-6 | 6 | 5 | Atomic Physics and Spectroscopy | 25 | 75 | 100 |
| 34 | III | Core Theory | Paper-7 | 6 | 5 | Basic Electronics | 25 | 75 | 100 |
| 35 | III | Core Practical | Practical-3 | 3 | 0 | General | 0 | 0 | 0 |
| 36 | III | Core Practical | Practical-4 | 3 | 0 | Electronics | 0 | 0 | 0 |
| 38 | III | Elective I | Paper-1 | 3 | 3 | Group (A) or (B) or (C) | 25 | 75 | 100 |
| 39 | IV | Skill Based Subject III | Paper - 3 | 3 | 3 | Astro Physics | 25 | 75 | 100 |
| | | | | 30 | 22 | | 125 | 375 | 500 |
| SEMESTER VI | | | | | | | CIA | Uni. Exam | Total |
| 34 | III | Core Theory | Paper-8 | 5 | 4 | Nuclear Physics and Radiation Physics | 25 | 75 | 100 |

B.Sc. Physics: Syllabus (CBCS)

| S. NO. | Part | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|--------|------|----------------------|-------------|----------------|--------|--|---------------|-----|-----|
| | | Course Title | | | | | | | |
| | III | Core Theory | Paper-9 | 5 | 4 | Relativity, Quantum Mechanics and Mathematical Physics | 25 | 75 | 100 |
| 35 | III | Core Theory | Paper-10 | 5 | 4 | Solid State Physics | 25 | 75 | 100 |
| 36 | III | Core Practical | Practical-3 | 6 | 3 | Any 20 Experiments given in syllabus | 25 | 75 | 100 |
| 37 | III | Core Practical | Practical-4 | | 3 | Electronics | 25 | 75 | 100 |
| 40 | III | Elective | Paper-2 | 3 | 3 | Group (A) or (B) or (C) | 25 | 75 | 100 |
| | III | Elective | Paper-3 | 3 | 3 | Group (A) or (B) or (C) | 25 | 75 | 100 |
| | IV | Skill based Subject | Paper-4 | 3 | 3 | Instrumentation Techniques | 25 | 75 | 100 |
| | V | Extension Activities | | - | 1 | | 100 | - | 100 |
| | | TOTAL | | 30 | 28 | | 300 | 600 | 900 |

| Part | Subject | Papers | Credit | Total credits | Marks | Total Marks |
|----------|------------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd Semester) | 2 | 4 | 8 | 100 | 200 |
| | Allied (Even Semester) | 2 | 4 | 10 | 100 | 200 |
| | Allied Practical | 1 | 2 | 2 | 100 | 100 |
| | Electives | 3 | 3 | 9 | 100 | 300 |
| | Core Theory | 10 | (3-7) | 45 | 100 | 1000 |
| | Core Practical | 4 | 3 | 12 | 100 | 400 |
| Part IV | Environmental Science | 1 | 2 | 2 | 100 | 100 |
| | Soft skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Lang. & Others/NME | 2 | 2 | 4 | 100 | 200 |
| | Skill Based | 4 | 3 | 12 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

ELECTIVE SUBJECTS

Students can choose any one of the groups (Elective I, II & III)

GROUP A

Elective 1: Digital Electronics

Elective 2: Applied Electronics

Elective 3: Microprocessor and its Applications – 8085

GROUP B

Elective 1: Materials Science

Elective 2: Applied Electronics

Elective 3: Laser and Fibre Optic Communication

GROUP C

Elective 1: Fundamentals of Nano Materials and its Characterization

Elective 2: Applied Electronics

Elective 3: Medical Physics

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SCIENCE

B.Sc. PHYSICS

SYLLABUS

UNDER CBCS

(With effect from 2017 - 2018)

SEMESTER I

PAPER – 1

PROPERTIES OF MATTER AND ACOUSTICS

UNIT – I: ELASTICITY

Hooke's law – Stress-strain diagram – Elastic moduli – Relation between elastic constants – Poisson's Ratio – Expression for Poisson's ratio in terms of elastic constants – Work done in stretching and work done in twisting a wire – Twisting couple on a cylinder – Determination of Rigidity modulus by static torsion – Torsional pendulum – Determination of Rigidity modulus and moment of inertia and q , n , σ by Searles method.

UNIT – II: BENDING OF BEAMS

Bending of beams – Expression for bending moment – Cantilever – Expression for depression at the loaded end – oscillations of a Cantilever – Expression for time period – Determination of Young's modulus by cantilever oscillations Non-uniform bending – Determination of young's modulus by Koenig's method – Uniform bending – Expression for elevation – Experiment to determine young's modulus using pin and microscope method.

UNIT – III : FLUIDS

Surface Tension: Synclastic and anticlastic surface – Excess of pressure – Application to spherical and cylindrical drops and bubbles – variation of surface tension with temperature – Jaegar's method-Applications of surface tension.

Viscosity : Viscosity – Rate flow of liquid in a capillary tube – Poiseuille's formula – Determination of coefficient of viscosity of a liquid – Variations of viscosity of a liquid with temperature- lubrication- Applications of viscosity.

SOUND

UNIT – IV : WAVES AND OSCILLATIONS

Simple harmonic motion – free, damped, forced vibrations and resonance – Fourier's Theorem – Application to saw tooth wave and square wave – Intensity and loudness of sound – Decibels – Intensity levels – musical notes – musical scale.

Acoustics of buildings : Reverberation and time of reverberation – Absorption coefficient – Sabine's Formula – measurement of reverberation time – Acoustic aspects of halls and auditoria.

UNIT – V: ULTRASONICS

Ultrasonic waves – Production – Piezo electric crystal method – Magnetostriction Method – Properties – Deductions – Attenuation – Diffraction – Acoustic Grating – Velocity of ultrasonics in liquids – application of ultrasonics – Medical, Industrial and Scientific – Non destructive testing (NDT) – Classification of ultrasonic testing – Pulse echo method – Sources of ultrasound – clinical applications of different scans.

Books for study:

1. Properties of matter by Murugesan R, S Chand & Co. Pvt. Ltd., New Delhi.
2. Properties of matter by Brij Lal & Subramaniam, N Eurasia Publishing Co., New Delhi, 1989.
3. Text book of sound by Brij Lal & Subramaniam, N Vikas Publishing House, New Delhi, 1982.
4. Text book of sound by M N Srinivasan – Himalaya Publications (1991).
5. Science and Technology of Ultrasonics by Baldevraj, Narosa [2004].

Books for reference:

1. Elements of Properties of Matter by Mathur D S, Shymmlal Charitable Trust, New Delhi, 1993.
2. Fundamentals of General Properties of Matter by Gulati H R, R Chand & Co. New Delhi, 1982.
3. Waves & Oscillations by Subrahmanyam N & Brij Lal, Vikas Publishing House Pvt. Ltd., New Delhi, 1994.
4. A Textbook of Sound by Khanna D R & Bedi R S, Atma Ram & Sons, Jew Delhi 1985.
5. Fundamentals of Physics, 6th Edition by D Halliday, R Resnick and J Walker, Wiley NY 2001.
6. Physics, 4th Edition vols, I, II & II Extended by D Halliday, R Resnick and K S Krane, Wiley NY 1994.
7. CRC Handbook of Physics & Chemistry, 80th ED., CR5 Press, NY, 1999.
8. The Feynman Lectures on Physics, Vols. I, II and III, by R P Feynman, RB Leighton and M Sands, Narosa, New Delhi, 1998.

ALLIED

PAPER – 1

CHEMISTRY – I

OBJECTIVE:

- Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1 General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Flux, Slag - Definition - Reduction methods - Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

2.1 Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3 Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation - Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons – Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3 , PCl_5 , SF_6 and XeF_6 .

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1 Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking – Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

ALLIED - 1
PAPER - 1
BIOCHEMISTRY I

UNIT-I: Chemistry of Carbohydrates

Definition and Classification of carbohydrate. Monosaccharides - occurrence, structure; physical and chemical properties, linear and ring forms (Haworth formula) for glucose and fructose. Disaccharides - occurrence, structure; physical and chemical properties of sucrose and lactose. Polysaccharides - occurrence, structure, physical and chemical properties of starch.

UNIT-II: Chemistry of amino acids

Definition and classification of amino acids. Reaction with ninhydrin, common properties of amino acids, amphoteric nature, isoelectric point, isoelectric pH and Zwitter ion.

UNIT-III: Chemistry of Proteins

Classification based on solubility, shape and size. Physical properties: salting in and salting out, denaturation, peptide bond. Structure of protein: primary, secondary, tertiary and quaternary structure.

UNIT-IV: Chemistry of Lipids

Definition, classification and functions of lipids. Occurrence, chemistry and biological functions of simple lipids, compound lipids (e.g. phospholipids) and derived lipids: steroids (e.g. cholesterol). Physical property-emulsification. Chemical property-saponification. Functions of bile acids and bile salts.

UNIT-V: Chemistry of Nucleic acids

Definition - nucleoside, nucleotide and polynucleotide. Double helical model of DNA and its biological functions. Structure, types and functions of RNA: tRNA, mRNA and rRNA. Differences between DNA and RNA.

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Rober K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan , MJP Publishers,Chennai-5.

SEMESTER II

PAPER – 2

THERMAL AND STATISTICAL PHYSICS

UNIT – I : TRANSMISSION OF HEAT

Conduction in solids : Thermal conduction – thermal conductivity of a good conductor – theory and determination – Forbe’s method – thermal conductivity of a poor conductor – theory and determination – Lee’s disc method – Derivation of Wiedmann – Franz law and its limitations – practical applications of conduction of heat.

Black body radiation : Stefan – Boltzmann law – determination of Stefan’s constant – laboratory method – distribution of energy in the spectrum of a black body – results – Planck’s quantum theory of radiation – solar constant – temperature of the Sun – Solar Spectrum.

UNIT – II: LOW TEMPERATURE PHYSICS

Joule – Kelvin effect – liquefaction of hydrogen – liquefaction of helium – Kammerling – Onne’s method – Helium I and II – Lambda point – production of low temperatures – adiabatic demagnetization – practical applications of low temperature – refrigerators and air-conditioning machines – super fluidity – application of super fluidity – elementary ideas and applications – Superconductivity – Type I and II superconductors – Meissner effect – applications of superconductors – superconducting magnets.

UNIT – III: THERMODYNAMICS I

Thermodynamics Potentials – Zeroth law, First and Second law of thermodynamics – Carnot’s theorem – thermodynamic scale of temperature – Perfect gas scale of temperature – internal combustion engines – Otto engine and Diesel engine – working and efficiency.

UNIT - IV: THERMODYNAMICS II

First latent heat equation (Clausius-Clapeyron equation) – effect of pressure on melting point and boiling point – second latent heat equation – Third law of thermodynamics – concepts of entropy – temperature entropy diagram – entropy of perfect gas – Maxwell’s thermo dynamical relations – derivation – applications – i) Clausius – Clapeyron equation, ii) Specific heat Relation.

UNIT – V: STATISTICAL PHYSICS

Phase space, Micro and Macro – canonical – Ensembles – Different types of ensembles – Definition of Probability – Relation between entropy & probability – Degrees of Freedom – Statement of theorem of equipartition of energy – Classical Statistics – Group Velocity and Phase velocity – Maxwell – Boltzmann law-distribution of velocity-Quantum statistics-Fermi-Dirac distribution law-Bose-Einstein distribution law-comparison of three statistics.

Books for study:

1. Heat and thermodynamics – Brijlal and Subramaniam, S Chand & Co.
2. Heat and thermodynamics – J B Rajam, S Chand & Co., New Delhi.
3. Thermal Physics – R Murugesan and Kiruthiga Sivaprasad, S Chand & Co., New Delhi.

Books for Reference:

1. Heat and thermodynamics – D S Mathur, S Chand & Co., New Delhi
2. Elements of Statistical Mechanics – Gupta and Kumar, Pragati Prakashan, Meerut.
3. Statistical Mechanics – Sathya Prakash and J P Agarwal, Kedar Nath & Ram Nath & Co., Meerut.
4. Introduction to Solid State Physics – C Kittel, Prentice Hall of India.

CORE PRACTICAL – I

(Any 16 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Young's modulus – non uniform bending – optic lever.
3. Young's modulus cantilever – depression – dynamic method – Mirror Scale and Telescope.
4. Rigidity modulus – torsional pendulum – without masses.
5. Rigidity modulus and moment of inertia – torsional pendulum – with identical masses.
6. Surface tension and interfacial surface tension – drop weight method.
7. Coefficient of viscosity of liquid – graduated burette – Radius of capillary tube by mercury pellet method.
8. Comparison of viscosities – (η_1/η_2).
9. q , n , σ by Searle's method.
10. Rigidity modulus – Static torsion – Mirror scale and telescope.
11. Compound Pendulum – Determination of 'g' and 'k'.
12. Thermal conductivity of a bad conductor – Lee's disc method.
13. Thermal conductivity of a good conductor-Forbe's method.
14. Specific heat of liquid – Newton's law of cooling.
15. Sonometer – frequency of tuning fork.
16. Sonometer – RD of a solid and liquid.
17. Focal length – R and μ of a long focus convex lens.
 - i Auto collimation method
 - ii Auxillary Lens Method
18. Focal length – R and μ of a concave lens.
 - i Combination Method
 - ii Auxillary Lens Method
19. Spectrometer – solid prism- μ of material of prism.
20. Spectrometer- Hollow prism - μ of a liquid.
21. Potentiometer – Calibration of low range voltmeter.
22. Potentiometer – Internal resistance.
23. Post office box – temperature coefficient of resistance.

ALLIED
PAPER – 2
CHEMISTRY – II

OBJECTIVE:

- Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biological functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions - Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1 Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- R_f value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

ALLIED
PAPER - 2
BIOCHEMISTRY II

UNIT-I: Metabolism

Glycolysis, TCA cycle and its energetics, HMP shunt pathway. Deamination, transamination reaction, transaminase enzymes, Urea cycle.

UNIT-II: Metabolic Disorders

Diabetes mellitus, Glycogen storage diseases, Glycosuria, Ketosis, Jaundice, Phenyl ketonuria, Alkaptonuria. Dehydration: definition, causes, symptom and prevention.

UNIT-III: Enzymes

Definition, classification of enzymes with one example. Mechanism of enzyme action - Lock and key mechanism, Induced Fit theory. Michaleis-Menton equation. Enzyme inhibition: competitive, uncompetitive and non competitive. Biological functions of enzymes.

UNIT-IV: Molecular Biology

Central dogma of molecular biology. DNA and RNA act as genetic material. Replication: Definition, types, mode of action of replication, mechanism of replication. General mechanism of transcription and translation. Genetic code.

UNIT-V: Vitamins

A brief outline of source, requirement, biological function and deficiency of Vitamins (fat soluble and water soluble vitamins).

References:

1. Lehninger Principles of Biochemistry-David L. Nelson, Michael M. Cox, Macmillan worth Publishers.
2. Harper's Biochemistry-Robert K. Murray, Daryl K. Grammer, McGraw Hill, and Lange Medical Books. 25th edition.
3. Fundamentals of Biochemistry-J.L. Jain, Sunjay Jain, Nitin Jain, S. Chand & Company.
4. Biochemistry-Dr. Amit Krishna De, S. Chand & Co., Ltd.
5. Biochemistry-Dr. Ambika Shanmugam, Published by Author.
6. Biomolecules-C. Kannan, MJP Publishers, Chennai-5.

**SEMESTER III
PAPER – 3**

ELECTRICITY AND MAGNETISM

UNIT – I : ELECTROSTATICS

Gauss' Law – Electric Field due to uniformly charged sphere – Electric Intensity - Electrostatic potential – electric potential as line integral of electric field – relation between electric potential and electric field in vector form – capacitance – capacitance of a spherical and cylindrical capacitor – energy of a charged capacitor – loss of energy due to sharing of charges - Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics - Parallel plate capacitor completely filled with dielectric.

UNIT – II : CURRENT ELECTRICITY & TRANSIENT CURRENT

Carey Foster bridge – theory – determination of temperature coefficient of resistance – calibration of ammeter and voltmeter using a potentiometer.

Growth and decay of current in a circuit containing resistance and inductance. Growth and decay of charge in circuit containing resistance and capacitor – measurement of high resistance by leakage – growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation.

UNIT – III : THERMO ELECTRICITY

Seeback, Peltier and Thomson effects – laws of thermoelectric circuits – Peltier coefficient – Thomson coefficient – application of thermodynamics to a thermocouple and expressions for Peltier and Thomson coefficients - thermo electric power and thermo electric diagrams.

UNIT – IV : ELECTRO MAGNETIC INDUCTION

Faraday's laws of electromagnetic induction in vector form – Lenz's law - determination of self-inductance by Anderson's bridge method and absolute mutual inductance by BG – Ruhmkorff's induction coil – induction coil and its uses – Coefficient of coupling – Earth inductor - Eddy Currents - Energy stored in a magnetic field.

UNIT – V : MAGNETISM

Magnetostatics: Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law.

Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials.

Books for study:

1. R Murugesan – Electricity and magnetism, 8th Edn, 2006, S Chand & Co., New Delhi.
2. M Narayanamurthy & N Nagarathnam, Electricity & Magnetism 4th Edn, National Publishing Co., Meerut.
3. Duggal and Chhabra, Electricity and Magnetism.
4. Brijlal, N Subramanyan and Jivan Seshan, Mechanics and Electrodynamics [2005], Eurasia Publishing House [Pvt.] Ltd., New Delhi.

Books for reference:

1. Sehgal D L, Chopra K L, Sehgal N K – Electricity and Magnetism, Sultan Chand & Sons, New Delhi. Brijlal and Subramanian, Electricity and Magnetism, 6th Edn., Ratan & Prakash, Agra.
2. David J Griffiths, Introduction to Electrodynamics, 2nd Edn. 1997, Prentice Hall of India pvt. Ltd., New Delhi.
3. Electricity & Magnetism by K K Tewari, S Chand & Co., 3rd Edition, 2001.

**ALLIED
MATHEMATICS – I**

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots-Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians -Concepts of polar co-ordinates-Curvature and radius of curvature in Cartesian co-ordinates and in polar co-ordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
3. P.R.Vittal (2003) *Allied Mathematics* .Marghan Publications, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics Vol-I, II* S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai.

SKILLED BASED SUBJECT

PAPER – 1

ELECTRICAL APPLIANCES

UNIT – I

Resistance and its types – capacitance and its types – Colour codes-inductance and its units – Transformers – Electrical Charge – Current – Electrical Potential

UNIT - II

Ohm's law – Galvanometer, Ammeter, Voltmeter and Multimeter Analog and Digital - Electrical Energy – Power – Watt – kWh – Consumption and electrical power.

UNIT – III

AC and DC – Single phase and three phase connections – RMS and peak values, House wiring – Star and delta connection – overloading – earthing – short circuiting – Fuses – Colour code for insulation wires

UNIT - IV

Inverter – UPS – generator and motor – types – different types of windings – circuit breaker-Electrical switches and its types.

UNIT – V

Electrical bulbs – Fluorescent lamps – Street Lighting – Flood lighting – Electrical Fans – Wet Grinder – Mixer – Water Heater – Storage and Instant types, electric iron box, microwave oven – Stabilizer, fridge.

Books for study:

1. A text book in Electrical Technology – B L Theraja – S chand & Co.
2. A text book in Electrical Technology – A K Theraja.
3. Performance and design of AC machines – M G Say ElBS Edn.

NON – MAJOR ELECTIVE

PAPER – 1

RENEWABLE ENERGY SOURCES

Unit - I: Conventional Energy Sources

The fossil fuels - commercial energy sources and their availability – various forms of energy – renewable and conventional energy system – comparison – Coal, oil and natural gas – applications– Merits and Demerits – fuel cells.

Unit - II: Solar Energy

Renewable energy sources – solar energy – nature and solar radiation – components – solar heaters – crop dryers – solar cookers – water desalination (block diagram) Photovoltaic generation – merits and demerits

Unit - III: Biomass energy fundamentals

Biomass energy – classification – photosynthesis – Biomass conversion process

Unit - IV: Biomass Utilization

Gobar gas plants – wood gasification – advantages & disadvantages of biomass as energy source

Unit - V: Other forms of energy sources

Geothermal energy – wind energy – Ocean thermal energy conversion – energy from waves and tides (basic ideas)

Books for Study:

“Renewable energy sources and emerging Technologies”, by D.P. Kothari, K.C. Singal & Rakesh Ranjan, Prentice Hall of India pvt. Ltd., New Delhi (2008)

Books for Reference:

“Renewable Energy sources and their environmental impact” – S.A. Abbasi and Nasema Abbasi PHI Learning Pvt. Ltd., New Delhi (2008).

SEMESTER IV

PAPER – 4

MECHANICS

UNIT – I : DYNAMICS

Rigid body – moment of inertia – radius of gyration – moment of inertia of a solid cylinder, cylindrical shell, solid sphere, spherical shell - Compound pendulum – theory – equivalent simple pendulum – reversibility of centers of suspension and oscillation

UNIT – II : STATICS AND HYDROSTATICS

Centre of pressure – centre of pressure of a vertical rectangular lamina and vertical triangular lamina- laws of floatation- meta centre and metacentric height of a ship- production of low pressure- rotary pump- diffusion pump- pirani gauge

UNIT – III : ROCKETS AND SATELLITES

Rockets and Satellites – Basic Principles of rocket motion – Rocket Equation, thrust and acceleration – Escape velocity multistage rockets – liquid, solid and cryogenic – propellant rockets

– space shuttle - Orbital velocity – launching of a satellite, types of satellite orbits.

UNIT – IV : CLASSICAL MECHANICS I

Lagrangian formulation of classical mechanics – Mechanics for a system of particles – Generalised co-ordinates – transformation equations – configuration space – Principles of virtual work – D'Alembert's principle – Lagrange's equation – Applications of Lagrange's equation – Simple pendulum.

UNIT – V : CLASSICAL MECHANICS II

Hamiltonian formulation of classical mechanics – phase space – Hamiltonian function – Hamilton's canonical equations of motion – Applications of Hamilton's equations of motion – Simple pendulum.

Books for study:

1. Mechanics and mathematical methods by R Murugeshn, S Chand. Elements of mechanics by Gupta.
2. Dynamics by Naranamurthi, National Publishing Company, Chennai. Classical Mechanics by Gupta Kumar and Sharma.
3. Classical Mechanics by B D Gupta and Sathya Prakash, Kedar Nath Ram Nath & Co.,

Books for Reference:

1. Mechanics by D S Mathur.
2. Classical Mechanics by Goldstein, Narosa.
3. Mechanics and Properties of Matter, C.L. Arora, S. Chand & Co.

CORE PRACTICAL – II

(Any 16 Experiments)

1. Young's modulus uniform bending Pin and microscope.
2. Young's modulus uniform bending Scale and Telescope.
3. Sonometer – AC frequency – steel and brass wires.
4. Melde's String – Frequency of the vibrator – Both modes.
5. Spectrometer – μ of a prism – i-d curve.
6. Spectrometer – grating – N and λ – Normal incidence method.
7. Spectrometer – grating – N and λ – Minimum deviation method.
8. Air wedge – thickness of a thin wire.
9. Carey Foster's bridge – Temperature coefficient of resistance.
10. Potentiometer – Calibration of high range ammeter.
11. Potentiometer – resistance and specific resistance of a wire.
12. Figure of merit of a galvanometer – Table Galvanometer.
13. BG – Figure of merit – Charge sensitiveness.
14. BG – Comparison of capacitances.
15. BG – Comparison of emf of two cells.
16. m and B_H – Tan C – deflection magnetometer and vibration magnetometer.
17. Low range power pack – using two diodes.
18. Transistor Characteristics – CE / CB modes.
19. Zener diode as a Voltage regulator.
20. IC Voltage regulator using 7805.

ALLIED MATHEMATICS – II

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume -Fourier series for functions in $(0, 2\pi)$ and $(-\pi, \pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types , Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient ,divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Gauss, Stoke's and Green's theorems(without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
3. P.R.Vittal(2003). *Allied Mathematics* .Marghan Publications, Chennai.
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai

SKILL BASED SUBJECT

PAPER – 2

ELECTRONIC APPLIANCES

UNIT – I

Passive devices – Resistors – types – characteristics – colour coding – capacitors – type – characteristics – colour coding star and delta connection of a resistors and capacitors.

UNIT - II

chokes – Transformers – testing of diodes, transistors and ICs – CRO – Waveforms and Lissajoue's figures – A/F and R/F oscillators – usage of bread board.

UNIT – III

Semiconductor diode – Zener diode – Transistor – Transistor configurations – diode rectifier – half wave and full wave – Bridge rectifier – Diode voltage doublers and multiplier.

UNIT – IV

Regulated power supply, Zener diode voltage regulator (Series and Shunt type) IC Voltage regulators: fixed positive – fixed negative – adjustable.

UNIT – V

Basic concepts of radio transmitter and receiver – Basic concepts of TV Transmitter and receiver – TV antennas: Resonance antennas and their characteristics – Dipole Antenna – Folded dipole – Yagi antenna – Yagi antenna design – Dish Antenna – DTH system – Mobile communication system - MODEM.

Books for study:

1. Principles of Electronics by V K Metha, S Chnd & Co., 5th edition 2001.
2. Functional Electronics by Ramanan.
3. Elements of Electronics by Bagde and Singh.
4. Monochrome and Colour TV by Gulati.
5. Basic Electronics, 6th Edition by B Grob, McGraw Hill NY 1989.

NON MAJOR ELECTIVE

PAPER – 2

BASIC PHYSICS

UNIT – I: MECHANICS

Force – Weight – Work – Energy – Power – Horsepower – Centrifuge – Washing Machine.

UNIT – II: HEAT

Variation of boiling point with pressure – Pressure cooker – Refrigerator – Air Conditioner – Principle and their capacities – Bernoulli Principle – Aero plane.

UNIT – III: SOUND AND OPTICS

Sound waves – Doppler effect – Power of lens – Long sight and short sight – Microscope – Telescope – Binocular - Camera.

UNIT – IV: GEO PHYSICS AND MEDICAL PHYSICS

Earthquake – Richter scale – thunder and lightning – Lightning arrestors – Cosmic showers – X-rays– Ultrasound scan – CT scan – MRI scan.

UNIT – V: SPACE SCIENCE AND COMMUNICATION

Newton's law of gravitation – Weather forecasting and communication satellites – Indian Satellites– Electromagnetic spectrum – Radio Waves – AM and FM transmission and reception.

Books for study:

1. The Learner's Series – Everyday Science – Published by INFINITY BOOKS, New Delhi.
2. The Hindu speaks on Science, Vol I & II, Kasturi & Sons, Chennai.

Books for Reference:

1. Fundamentals of Physics by D. Halliday, R. Resnick and J. Walker, 6th Edition, Wiley, NY (2001).
2. Physics, Vols I, II, III by D. Halliday, R. Resnick and K.S. Krane, 4th Edition, Wiley, New York (1994).
3. The Feynmann Lectures on Physics Vols, I, II, III by R.P. Feynmann, R.B. Leighton & M. Sands, Narosa, New Delhi (1998).

SEMESTER V

PAPER – 5

OPTICS

UNIT – I : GEOMETRICAL OPTICS

Spherical aberration in lenses – Methods of minimizing spherical aberration – Condition for minimum spherical aberration in the case of two lenses separated by a distance – Chromatic aberration in lenses – Condition for achromatism of two thin lenses (in contact and out of contact)

– coma – astigmatism – Ramsden's and Huygen's eyepieces – Constant deviation spectrometer – Calculation of characteristic wave number of spectral lines.

UNIT – II : INTERFERENCE

Theory of thin films – Air wedge – Determination of diameter of a thin wire by air wedge – Michelson's Interferometer – Theory – Applications – wave length, thickness of thin transparent material and resolution of spectral lines – Brewster's fringes – Refractive index of gases – Jamin's & Rayleigh's Interferometers.

UNIT – III : DIFFRACTION

Fresnel's diffraction – Diffraction at circular aperture, straight edge and single slit – Plane diffraction grating – theory and experiment to determine wavelength – normal incidence – oblique incidence – Fraunhofer's diffraction – Missing orders – Overlapping spectra Rayleigh's criteria – Resolving power of telescope, prism, microscope and grating.

UNIT – IV : POLARIZATION

Introduction to polarisation – Double refraction – Huygen's explanation of double refraction in uniaxial crystal – Dichroism – Polaroids and their uses Plane, elliptically and circularly polarized light – Production and detection – Optical Activity – Fresnel's explanation of optical activity – Specific Rotatory Power – Determination using Laurent's Half Shade Polarimeter – Kerr effect and Faraday effect.

UNIT – V : FIBRE OPTICS

Introduction – Structure of an optical fibre - Classification of fibres based on Refractive index and number of modes of transmission – Theory of transmission of electromagnetic wave through fibres – Acceptance angle - Numerical aperture – absorption and scattering losses – optical fibre communication system - Application of optical fibres as wave guide and sensors.

Books for study:

1. Optics by Subramaniam N & Brij Lal, S Chand & Co. Pvt. Ltd., New Delhi, 1990.
2. Optics by Khanna D R & Gulati H R, S Chand & Co. Pvt. Ltd., New Delhi, 1979.
3. Optics and Spectroscopy by Murugesan, S Chand & Co. Pvt. Ltd., New Delhi.
4. Optical fiber communications –Principles and Practice by John M Senior, Second edition, Prentice Hall, Pearson New Delhi.
5. Optical fiber communications by Gerd Keiser, Second edition, McGraw Hill

Books for Reference:

1. Fundamentals of Optics by Jenkins Francis and White E Harvey, McGraw Hill Inc., New Delhi, 1976.
2. Optical Physics by Lipson. S G, Lipson H and Tannhauser D S, Cambridge University Press (1995).
3. Fundamental of Optics by Raj M G, Anmol Publications Pvt. Ltd., (1996), New Delhi.
4. Fundamentals of Physics, 6th Edition, by D Halliday, R Resnick and J Walker. Wiley NY 2001.
5. Physics, 4th Edition Vols I, II & II Extended by D Halliday, R Resnick and K S Krane, Wiley, Ny, 1994.
6. CRC Handbook of Physics & Chemistry, 80th Ed., CRS Press, Ny, 1999.
7. The Feynman Lectures on Physics, Vols. I, II and III by R P Feynman, R B Leighton and M Sands, Narosa, New Delhi 1998.
8. Fibre Optic Communication System, Govind P. Agarwal, John –Willey & Sons.

PAPER – 6**ATOMIC PHYSICS AND SPECTROSCOPY****UNIT – I : DISCHARGE PHENOMENON THROUGH GASES**

Moving of a charge in transverse electric and magnetic fields – specific charge of an electron – Dunnington's method – Magnetron method – Positive rays – Thomson parabola method – Aston and Dempster's mass spectrograph.

UNIT – II : ATOMIC STRUCTURE

Vector atom model – Pauli's exclusion principle – explanation of periodic table – various quantum numbers – angular momentum and magnetic moment – coupling schemes – LS and JJ coupling – spatial quantisation – Bohr magneton – Stern and Gerlach experiment.

Spectral terms and notations – selection rules – intensity rule and interval rule – fine structure of sodium D lines – alkali spectra – fine structure of alkali spectra – spectrum of Helium.

UNIT – III : IONISATION POTENTIAL AND SPLITTING OF ENERGY LEVELS

Excitation and ionization potential – Davis and Goucher's method – Zeeman effect – Larmor's theorem – Debye's explanation of normal Zeeman effect – Anomalous Zeeman effect – theoretical explanation. Lande's 'g' factor and explanation of splitting of D_1 and D_2 lines of sodium – Paschen back effect-theory – Stark effect (qualitative treatment only).

UNIT-IV: INFRARED AND RAMAN SPECTROSCOPY

The energy of a Diatomic molecule - The simple harmonic oscillator - The Diatomic vibrating rotator - The vibration - rotation spectrum of carbon monoxide - Techniques and Instrumentation (outline).

Quantum theory of Raman effect - Molecular Polarizability - Pure rotational Raman spectra of linear molecules - Vibrational Raman spectra - Structured determination from Raman and Infrared spectroscopy - Techniques and Instrumentation (outline).

UNIT V: LASER PHYSICS

Lasers: Population inversion, Laser pumping, Resonators - Vibrational modes of resonators, number of modes/unit volume - Open resonators, Control resonators, Q Factor, Losses in the cavity, Threshold condition, Quantum yield. Ruby Laser – 3 level system, Pumping power, Spiking U^{3+} in CaF_2 laser, four level laser, Neodymium laser - Nd:YAG, Applications of Lasers in Industry, Medicine & Communication.

Books for study:

1. Modern physics by R Murugesan, S Chand & Co., New Delhi - 2004.
2. Atomic and Nuclear physics by N Subramanian and Brij Lal, S Chand & Co. - 2000.
3. Atomic physics by J B Rajam.
4. Spectroscopy by Gupta & Kumar
5. Spectroscopy by Banewell
6. Laser Fundamentals, by William T. Silfvast, Cambridge University Press,

Books for Reference:

1. Atomic physics by A B Gupta and Dipak Ghosh – Books and Allied Publishers.
2. Modern physics by J H Hamilton and Yang, McGraw Hill Publication 1996.
3. Concepts of Modern physics by A Beiser, Tata McGraw Hill, New Delhi 1997.
4. Fundamentals of physics, 6th edition, by D Halliday, R Resnick and J Walker, Wiley NY 2001.
5. Laser and Non Linear Optics by B.B.Laud, New Age international.
6. Laser systems and applications by Niyand Choudhary and Richa Verma, PHI, New Delhi

PAPER – 7

BASIC ELECTRONICS

UNIT – I : SEMICONDUCTOR THEORY DEVICES AND CHARACTERISTICS

Classification of solids in terms of forbidden energy gap Fermi level – Fermi-Dirac function – Carrier concentration intrinsic and extrinsic semi conductors – effect of temperature on Fermi level – PN junction diode – Zener diode – Tunnel diode – photo diode – PIN – APD – Photo transistor – JFET construction and working – types of JFET – biasing – V-I characteristics in common source mode – JFET as amplifier.

UNIT – II : RECTIFIERS AND AMPLIFIERS

Half-wave, Full-wave and bridge rectifier – Two port representation of a transistor – h -parameters – AC equivalent circuit using h -parameters – analysis of an amplifier using h -parameters – Expressions for current gain, voltage gain input impedance, output impedance and power gain for common emitter only. RC coupled amplifier – frequency response curve – classification of amplifiers – class A power amplifier – Push-pull, class B power amplifier – Darlington pair - Emitter follower.

UNIT – III : FEEDBACK OSCILLATORS

Voltage gain of a feedback amplifier – Barkhausen criterion – Hartley, Colpitt's, phase shift and Weinbridge oscillators – expressions for frequency of oscillations and condition for sustained oscillations in each case – crystal oscillator – frequency stability.

UNIT – IV : WAVE SHAPING CIRCUITS AND MULTI VIBRATORS

Clipping and clamping circuits – biased clipper – integrating and differentiating circuits. Multivibrators – Astable – Mono stable and bi-stable multivibrators-Schmitt trigger.

UNIT – V : RADIO COMMUNICATION AND TELEVISION

Principles of transmission and reception – Modulation – types of modulation – amplitude modulation – frequency modulation and phase modulation – theory and mathematical analysis for AM, FM and PM – detector – AM Detector – FM Discriminator – AM and FM transmitter and receiver – RADAR – Range equation – Applications of RADAR.

Books for study:

1. Principles of electronics by V K Mehta, S Chand & Co., 5th edition 2001. Elements of electronics by Bagde and S P Singh.
2. Functional electronics by Ramanan. Monochrome and Colour TV by Gulati.
3. Basic and applied electronics by M Arul Thalpathi, Comptek, Publishers, Chennai 2005.
4. Electronic Communication systems, by George Kennedy, Bernard Davis , S R M Prasanna, 5th edn, Tata McGraw Hill, India

Books for reference:

1. Electronic principles by Malvino.
2. Electronic devices and circuits by Allen Mottershed.
3. Monochrome and colour TV Gulati.
4. Basic Television and videosystems by B Grob.
5. Solid State Electronics by Manna, Tata McGraw Hill.
6. Basic electronics, 6th Edition by B Grob, McGraw Hill, NY 1989.
7. Introduction to Radar systems, by Merrill I Skolnik, McGraw Hill.

SKILL BASED SUBJECT

PAPER – 3

ASTRO PHYSICS

UNIT – I: ASTRONOMICAL INSTRUMENTS

Optical telescope - reflecting telescope - types of reflecting telescope - advantages of reflecting telescopes - radio telescope - astronomical spectrographs - photographic photometry - photoelectric spectrometry- detectors and image processing.

UNIT – II : SPACE

Introduction – Hubble’s Law – Big bang theory – Shape of Universe – Expanding universe in space – Galaxies – Types of Galaxies – Spiral, Elliptical and Irregular Galaxies – Clusters of Galaxies – Milky Way – Quasars.

UNIT – III : STARS

Birth of Stars – Colour and Age – Life of Stars – Red giant stars – White dwarf star – Neutron Star – Black hole – Supernovae – Constellations - Zodiac.

UNIT – IV : SOLAR SYSTEM

Introduction – Sun – Structure of Sun – Nuclear reactions in sun – Sun spot and solar flares – Earth – Structure of earth – Atmosphere – Moon and its structure – Inner planets – Outer planets – Asteroids – Meteors – Meteorites - Comets.

UNIT – V : SPACE DISTANCE, UNITS AND CO-ORDINATES

Cislunar space – Translunar space – Inter planetary distance – Interstellar space – Inter galactic space – Light Year – Astronomical Unit – Astronomical Map. Astronomical Systems – Astronomical co-ordinates – Celestial Sphere – Celestial Equators – Celestial Poles - Celestic.

Books for study:

1. Baidyanath Basu / An introduction to Astrophysics / second printing, Prentice Hall of India Private limited New Delhi – 2001
2. Hewish. A / Physics of the universe / CSIR publication, New Delhi, 1992.
3. Biman Basu / Inside Stars / CSIR Publication, New Delhi, 1992.
4. Biman Basu / Cosmic Vistas / National Book Trust of India, 2002.
5. Krishnasamy K.S. / Astro Physics a modern perspective / New Age International / New Delhi.
6. Murugesan. R / Modern Physics / S. Chand & Co. / New Delhi, 2003.

Books for reference:

1. Mohan Sundara Rajan / Space today / National Book Trust of India, 2000.
2. William K. Hartmann / The Cosmic Voyage through time and space / Wadsworth Publishing company, California, 1990.

SEMESTER VI

**PAPER – 8
NUCLEAR AND RADIATION PHYSICS**

UNIT – I : NUCLEAR STRUCTURE

Nuclear spin – determination of magnetic dipole moment, electric quadrupole moment, parity of nuclei, isospin, theories of nuclear composition, proton and electron hypothesis, proton – neutron hypothesis, nuclear forces – meson theory of nuclear forces.

Liquid drop model – Bethe – Weizacker's mass formula – application to alpha decay – Bohr – Wheeler theory – Shell model – evidences – theory of energy level diagram – spin orbit interaction
– magic numbers – nuclear stability.

UNIT – II : NUCLEAR DECAY

Radioactive disintegration – law of successive disintegration – transient and secular equilibrium – radioactive series – Geiger – Nuttal law – Age of earth – alpha particle disintegration energy – alpha particle spectra – theory of alpha decay (qualitative treatment). Beta ray spectra – origin – neutrino theory of beta decay – electron capture – gamma rays – determination of wavelength by Dumond – crystal spectrometer – nuclear isomerism.

UNIT – III : PARTICLE ACCELERATORS AND DETECTORS

Cyclotron – synchrocyclotron – Betatron – electron synchrotron – proton synchrotron (Bevatron) GM counter – ionization chamber – bubble chamber – scintillation counter – photographic emulsion techniques.

UNIT – IV : RADIATION PHYSICS

Nuclear fission – Chain reaction – four-factor formula – reactor theory – critical size of a reactor – general aspect of reactor design – reactor shielding – reactor control – classification of reactors – pressurized heavy water reactor – fast breeder reactor – Radiation hazards – biological effects of radiation – radiation sickness – radiation units and operational limits – radiation survey meters – pocket dosimeter – control of radiation hazards – radiation therapy – radioisotopes used for therapy – nuclear medicine – industrial applications – food preservatives.

UNIT – V : ELEMENTARY PARTICLES

Classification – types of interaction – symmetry and conservation laws – hadrons – leptons – baryons – mesons – strangeness – hyperons – antiparticles – antimatter – basic ideas about quarks – types of quarks.

Books for study:

1. Modern physics by R Murugesan S Chand & Co.
2. Introduction to Modern Physics by Rich Meyer, Kennard, Coop Tata McGraw Hill Publishing Co.
3. Atomic and nuclear physics by Littlefeld & Thorley.
4. Modern physics by R Murugesan & Kiruthiga, Sivaprasath S Chand & Co. (2006).

Books for reference:

1. Nuclear Physics S N Ghoshal – S Chand & Co. Edition 2003.
2. Nuclear Physics D G Tayal – Himalayan Publishing House.
3. Elements of Nuclear Physics – M L Pandya & R P S Yadav Kedar Nath Ram Nath (2000).
4. Nuclear Physics – Irving Keplan.
5. Nuclear Physics – J B Rajam, S Chand Publishing Co.

PAPER – 9

RELATIVITY, QUANTUM MECHANICS & MATHEMATICAL PHYSICS

UNIT – I : RELATIVITY

Frames of reference – Michelson – Morley experiment – Significance of negative result – postulates of special theory of relativity – Lorentz transformation equations – Length contraction – Time dilation – Relativity of simultaneity – Law of addition of velocities – variation of mass with velocity – relativistic kinetic energy equations – postulates of general theory of relativity – gravitational red shift.

UNIT – II : WAVE MECHANICS

Matter waves – de Broglie wavelength – wave velocity and group velocity – Heisenberg's Uncertainty principle – proof of Uncertainty principle for one dimensional wave packet – Postulates of wave mechanics – properties of wave functions – operator formalism – eigen functions – eigen values – expectation values.

UNIT – III : SCHRODINGER EQUATIONS AND ITS APPLICATIONS

Schrodinger equation – time dependent and time independent – application of Schrodinger equations – linear harmonic oscillator – zero point energy – particle in a one dimensional box – barrier penetration and tunnelling effect – rigid rotator – hydrogen atom.

UNIT – IV : MATHEMATICAL PHYSICS

Gauss divergence theorem – Stoke's theorem – Green's theorem – applications of vectors to hydrodynamics.

Orthogonal curvilinear coordinates – spherical polar coordinates – differential operators in terms of orthogonal curvilinear coordinates – expressions for gradient, div, curl and ∇^2 in Cartesian, spherical and cylindrical coordinates.

UNIT – V : SPECIAL FUNCTIONS

Beta and gamma functions – problems – relation between beta and gamma functions – Bessel's differential equations – Legendre's differential equations – Hermite's differential equations – Laguerre's differential equations – series solutions – Dirac delta functions - properties.

Books for study:

1. Quantum Mechanics by V. Devanathan, Narosa, Chennai, 2005.
2. Modern Physics by R Murugesan, Kiruthiga, Sivaprasath S Chand & Co. (2007).
3. Quantum Mechanics by V K Thangappan, Wiley Eastern.
4. A Text Book of Quantum Mechanics by P M Mathews and Venkatesan, McGraw Hill. Mathematical Physical by Sathya Prakash.
5. Mechanics and Mathematical Methods by Murugesan, S Chand Publishing & Co.

Books for reference:

1. Mathematical Physics by B D Gupta.
2. Quantum Mechanics by Ghatak and Loganathan, McMillan.
3. Basic Quantum Mechanics by A Ghatak, McMillan India (2002).

PAPER – 10

SOLID STATE PHYSICS

Unit - I

Crystallography: Distinction between crystalline and amorphous solids – Different features of the crystal – Crystal lattice – Basis – Primitive and Unit cell – Number of lattice points per unit cell - Seven Classes of Crystals - Bravais lattices – Miller indices – Elements of Symmetry – Structure of KCl and NaCl crystal - Diamond Structure – Atomic Packing – Atomic radius – Lattice constant and density- Crystal structure (sc; hcp; fcc; bcc.)

Unit - II

Types of Bonding in Crystals - Ionic, Valence, Metallic, vanderwaal's and Hydrogen Bonding – Optical properties of solids – Specific heat capacity of solids – Dulong and Petit's law – Einstein's and Debye's theory – Explanation for the Occurrence of Super Conductivity - General Properties of Superconductors - Types of Superconductors – Meissner effect - Application of Superconductors.

Unit - III

Diffraction of x-Rays by Crystals - Bragg's Law In one Dimension - Experimental Method in x- Ray Diffraction - Laue Method, Rotating Crystal Method - Powder Photograph Method - von Laue's equations. Point Defects, Line Defects - Surface Defects - Volume Defects - effects of Crystal Imperfections.

Unit - IV

Different Type of Magnetic materials - Classical Theory of Diamagnetism (Langevin's Theory) - Langevin's Theory of Paramagnetism - Weiss Theory of Paramagnetism - Qualitative Explanation of Heisenberg's Internal Field and Quantum Theory of Ferromagnetism.

Unit - V

Fundamental Definitions in Dielectrics - Different types of Electric polarization - Frequency and Temperature Effects on Polarization - Dielectric Loss - Local Field on Internal Field Clausius-Mosotti Relation - Determination of Dielectric Constant Dielectric Breakdown - Properties of Different Types of Insulating Materials.

Books for Study:

1. Solid State Physics Gupta and Kumar
2. Modern Physics R Murugesan
3. Material Science by M. Arumguarn, Anuradha Publishers.
4. Material Science and Engineering by V.Raghavan, PHI
5. Introduction to Solids by Azaroff, TMH.
6. Concepts of Modern Physics by Beiser, Tata Mc.Graw Hill, 5th Edition, 1997.

Books for Reference:

1. Introduction to Solid State Physics by Kittel, Wiley and Sons, 7th Edition.
2. Solid State Physics A J Dekker

CORE PRACTICAL – III

(Any 20 Experiments)

1. Bifilar Pendulum – Parallel Threads – Verification of Two Theorems.
2. Young's modulus – Koenig's method - non uniform bending.
3. Young's modulus – Koenig's method - uniform bending.
4. Newton's rings – R_1 , R_2 and – μ of material a convex lines.
5. Spectrometer i – I' Curve.
6. Spectrometer – narrow angled prism – angle of deviation – normal incidence and normal emergence – refractive index.
7. Dispersive power of a prism.
8. Dispersive power of a grating.
9. Spectrometer – Cauchy's constants.
10. Lasers – Determination of Numerical aperture of a fiber
11. Lasers - diffraction at a straight wire – determination of thickness of the wire.
12. Field along the axis of circular coil – deflection magnetometer – M and B_H – Null Method.
13. Field along the axis of circular coil – Vibrating magnetic needle - B_H .
14. EMF of a thermocouple – Mirror galvanometer – Direct deflection method.
15. Potentiometer – emf of a thermocouple.
16. Potentiometer – calibration of high range voltmeter.
17. Potentiometer – Conversion of galvanometer into voltmeter.
18. Potentiometer – Conversion of galvanometer into ammeter.
19. BG – absolute capacitance of a capacitor.
20. BG – comparison mutual inductances.
21. BG – High resistance by leakage.
22. BG – internal resistance of a cell.
23. Hartley Oscillator.
24. Colpitt's oscillator.
25. RC Coupled single stage amplifier (without feedback).

CORE PRACTICAL – IV

ELECTRONICS

1. FET – Characteristics.
2. UJT – Characteristics.
3. UJT – Relaxation oscillators.
4. Differentiating and integrating circuits – using op-amp.
5. NAND, NOR as universal gates.
6. Verification of De Morgan's Theorems.
7. Transistor – Phase shift oscillator.
8. Transistor – Wien bridge oscillator.
9. Emitter Follower.
10. Op – Amp – Voltage follower, adder, subtractor, averager (inverting mode).
11. Op – Amp – Inverting amplifier with frequency gain response.
12. Half adder and Full adder – using NAND gate only.
13. Half subtractor and Full subtractor – using NAND gate only.
14. RS, Clocked RS, and D Flip Flops using NAND gate only.
15. Four bit ripple counter – 7473 / 7476.
16. Shift Register – Four bit left / right – 7473 / 7476.
17. Microprocessor – 8 bit addition, Subtraction – using BCD & Hexadecimal.
18. Number conversion – 8 bit – BCD to binary, Binary to BCD, Hex to ASCII using 8085.
19. Square and Square root of Hex numbers – 8 bit – using 8085.
20. Microprocessor – Sum of N elements

SKILL BASED SUBJECT

PAPER – 4

INSTRUMENTATION TECHNIQUES

UNIT – I : ELECTRICAL INSTRUMENTATION

AC bridges – Measurement of Inductance by Maxwell's Inductance Bridge – Measurement of Capacitance by De Sauty's Bridge – Measurement of Mutual Inductance by carry Foster bridge – ac differential voltmeter – dc differential voltmeter – Analog multimeter.

UNIT – II : ELECTRONIC INSTRUMENTATION

Analog to Digital converters – Dual slop ADC and Successive approximation ADC – Digital counter (four bit) – Digital voltmeter – Digital Frequency Meter – Digital Multimeter – Digital Thermometer.

UNIT – III : ANALYTICAL INSTRUMENTATION

CRO – measurement of time period and frequency – Distortion analyzer – Wave analyzer – Spectrum analyzer – IR spectrometer – UV spectrometer – Fast Fourier Transform (FFT) analyzer – Ultrasound scanner.

UNIT – IV : BIO-MEDICAL INSTRUMENTATION

Bioelectric potentials – resting and action potential – Half cell potential – surface needle and micro electrodes – principle, description, function and recording of ECG, EMG and EEG artificial pace maker – simulators – heart lung machine – kidney machine – pH meter – laser blood flow meter.

Strain gauge and measurement of strain – Measurement of pressure using electrical transducer – Measurement of seismic vibration using seismic transducer – Piezo – electric accelerometer – Measurement of temperature using semiconductor device – Radiation measurement by GM counter.

Books for study:

1. Arumugam M / Biomedical instrumentation / Anuradha Publications, Kumbakonam / 2011.
2. Sawhney A K / A course in Electrical and Electronics Measurements and Instrumentation / Dhanpat Rai & Co., Delhi / 2003.
3. Alan S Morris / Measurement & Instrumentation Principles / Elsevier / 2006.
4. Anand M.M.S. / Electronics Instruments and Instrumentation Technology / PHI, New Delhi / 2006.

ELECTIVE SUBJECTS

Students can choose any one of the groups (Elective I, II & III)

GROUP A

Elective 1: Digital Electronics

Elective 2: Applied Electronics

Elective 3: Microprocessor and its Applications – 8085

GROUP B

Elective 1: Materials Science

Elective 2: Applied Electronics

Elective 3: Laser and Fibre Optic Communication

GROUP C

Elective 1: Fundamentals of Nano Materials and its Characterization

Elective 2: Applied Electronics

Elective 3: Medical Physics

ELECTIVE

GROUP A

PAPER – 1

DIGITAL ELECTRONICS

UNIT – I : DIGITAL FUNDAMENTALS AND LOGIC GATES

Number systems – decimal, binary, octal and hexadecimal system – Conversion from one number system to another. Codes – BCD code – Excess 3 code, Gray code – ASCII code - Binary arithmetic – Binary addition – subtraction – unsigned binary numbers – sign magnitude numbers – 1's and 2's complement – Binary multiplications and division - AND, OR circuits using diodes and transistors – NOT using transistors – NAND, NOR and EXOR – functions and truth tables. NAND & NOR as universal gates.

UNIT – II : BOOLEAN ALGEBRA AND SIMPLIFICATION OF LOGIC CIRCUITS

Laws and theorems of Boolean algebra – De Morgan's theorems and their circuit implications - Simplification of Boolean equations – Karnaugh map – pairs, quads, octets – 2,3 and 4 variables - Arithmetic building blocks – Half adder – Full adder – parallel binary adder – Half subtractor – Full subtractor – The adder-subtractor – digital comparator – parity checker / generator.

UNIT – III : DATA PROCESSING CIRCUITS AND SEQUENTIAL LOGICS

Multiplexers – Demultiplexers – Decoders – 1 of 16 decoder BCD to decimal decoder – seven segment decoder – Encoders – Flip Flops – RS Flip Flop – Clocked RS Flip-flop – D flip-flop – JK flip-flop – JK master slave flip-flop – T type flip-flop.

UNIT – IV : SHIFT REGISTERS AND COUNTERS

Types of registers – serial in serial out – serial in parallel out – parallel in serial out – parallel in parallel out – ring counter – asynchronous counter – decoding gates – omitted states – modulus counters – BCD counter – up down counter – synchronous counter – combination counters – decade counter – cascaded counters.

UNIT – V : D/A AND A/D CONVERTERS

Introduction – variable resistor network – binary ladder – D/A converter – D/A accuracy and resolution – A/D converter – simultaneous conversion – A/D accuracy and resolution.

Books for study:

1. Malvino and Leech, (2000), Digital Principles and Application, 4th Edition, Tata McGraw Hill, New Delhi.
2. Millman and Halkias, (1972), Integrated Electronics, International Edition, McGraw Hill, New Delhi.
3. Arul Thalapapathi, Fundamentals of digital computers, Comptek publishers, Chennai, 1995.

Books for Reference:

1. Computer architecture and logic design by T C Bartee, McGraw Hill, 1991.2.
2. Solid state electronics by 1 Agarwal and Anit Agarwal.
3. Digital integrated electronics by Herbert Taub and Donald Schilling, McGraw Hill.
4. Anokh Singh and A K Chhabra, (2005), Fundamentals of Digital Electronics and Microprocessors, 2nd revised and enlarged Ed., S Chand & Co. Ltd., New Delhi.
5. Digital fundamentals – Floyd – Pearson Education 8th Edition 2004 S Chand Publications.

PAPER – 2

APPLIED ELECTRONICS

UNIT – I : SPECIAL DEVICES AND APPLICATIONS

FET – Characteristics – parameter FET as amplifier – FET as VVR – MOSFET – Depletion and enhancement – UJT characteristics – UJT as relaxation oscillator – SCR characteristics – SCR as half wave rectifier and full wave rectifier. SCR as static current switch – Firing of SCR using UJT.

UNIT – II : OPERATIONAL AMPLIFIER AND APPLICATIONS

OPAMP – Parameters – Inverting and Non-inverting amplifier – gain – Miller effect – Virtual ground – Offset voltage – offset current – PSRR – CMRR.

OPAMP – Sign and Scale changer – adder, subtractor and averager – Integrator and differentiator – DC voltage follower – ac voltage follower –

UNIT – III : OTHER APPLICATION OF OPAMP

OP AMP logarithmic amplifier – antilogarithmic amplifier – Logarithmic multiplier – Logarithmic divider. Comparator – Schmitt trigger – astable multivibrator – monostable multivibrator – Bistable multivibrator.

UNIT – IV : 555 TIMER AND PLL

555 block diagram and work monostable operation – Astable operation – Schmitt trigger. Phase – Locked Loops (PLL) : Basic principles – Phase Detector.

Comparator – Analog phase detector – Digital phase detector – voltage controlled oscillator (VCO).

UNIT – V : D/ A AND A/D CONVERTER

Weighted resistor D/A converter – 4-bit R-2R ladder DAC – Analog to Digital converter – Stair case ADC – tracking or servo ADC – Successive approximation ADC – Flash ADC
Duel slope ADC.

Books for Study:

1. Basic and Applied Electronics by M. Arul Thalpathi – Comtec Publisher Chennai – 2005.
2. Digital principles and applications – Malvino Leach – 4th Edn. – Tata McGraw Hill 1992.
3. Integrated Electronics by Jacob Millman and Christos C. Halkias – McGraw Hill International 1971.
4. Linear Integrated Circuits by D. Roy Choudhury and Shail Jain – New age international (P) Ltd. OP-AMPS and linear integrated circuits – by Ramakant A. Gayakward – Printice Hall of India 1994.

Books for Reference:

1. Digital Computer electronics by Albert Paul Malvino – TMH Edition 1992.
2. Electronics – Analog and Digital – IJ Jagrath – Prentice – Hall of India – New Delhi – 1999.
3. Operational amplifier and linear integrated circuits – Prentice Hall Inc. N.J. 1977.

PAPER - 3

MICROPROCESSOR AND ITS APPLICATIONS - 8085

UNIT – I : MICROPROCESSOR ARCHITECTURE AND ITS OPERATIONS

Microprocessors – Architecture of 8085 – pin out configurations of 8085 – Bus organization and timings: buses – buffer – address bus, data bus, multiplexing address / data bus and control & status signals – ALU – registers in 8085 – flags – decoding and execution of instruction – Interrupts and its types.

UNIT – II : PROGRAMMING MODEL OF 8085

Classification of instructions and format – 8-bit data transfer, arithmetic, logical and branch instructions – Addressing modes – 16 bit data transfer and memory related instructions – stack and subroutine instructions – comparison of stack and subroutine instructions – Logical rotate and compare instructions – RIM and SIM interrupt instructions – 8-bit code conversion: Binary to BCD, BCD to binary, binary to ASCII, ASCII to binary.

UNIT – III : TIME DELAY, DESIGN OF COUNTERS AND MEMORY INTERFACE

Counters – time delay using one and pair of registers – Instruction timings of 8085 – T-states – delay routines and delay calculations.

Memory interface : 2K x 8, 4K x 6 ROM and RAM interface – timing diagram for memory read and memory write cycles – instructions cycle, machine cycle.

UNIT – IV : INTERFACING I/O DEVICES

Interfacing concepts – peripheral I/O instructions – interfacing input and output using decoders – interface of LED output display for binary data – Memory mapped I/O – LED display of binary data – comparison of peripheral I/O and memory mapped I/O.

UNIT – V : INTERFACING DATA CONVERTERS AND PERIPHERAL DEVICES

Concepts of D/A and A/D converters and circuits – illustration of interfacing 8-bit D/A - successive approximation A/D converters – interfacing of programmable peripheral device 8255 – Programming 8255A MODE zero – interfacing with ports of 8255 with LED's to run various counters.

Books for study:

1. Microprocessor Architecture, Programming and Applications with the 8085 – R.S. Goankar, 3rd Edn. Prentice Hall.
2. Fundamental of Microprocessor – 8085 – Architecture, Programming and interfacing – V. Vijyendra, S. Viswanathan, Pvt. Ltd., 2003.

Books for reference:

1. Digital computer electronics: an introduction to microcomputers – Malvino, 2nd Edn., Tata McGraw Hill.
2. Fundamental of Microprocessor and Microcomputers – B. Ram.
3. Computer System Architecture – Moris Mano, 3rd Edn., Prentice Hall India.
4. Introduction to Microprocessors : Software, Hardware, Programming – Lance A. Leventhal, Prentice Hall India.

ELECTIVE

GROUP B

PAPER – 1

MATERIALS SCIENCE

UNIT – I : MATERIALS SCIENCE

Classification of materials – Properties of Engineering materials – Materials Structure – Types of Bonds – Bonds Formation – Ionic Bond – Covalent Bond – Metallic Bond – Comparison of Bonds – Secondary Bonds.

UNIT – II : PHASE DIAGRAM AND TRANSFORMATION

Basic terms – Solid Solution – Hume – Rothery's rule – Intermediate Phase – Phase Diagrams – Gibb's Phase Rule – Time – Temperature cooling curves – Construction of Phase Diagrams – The Lever Rule – Equilibrium Binary System – Eutectic System – Mechanism of Phase Transformation.

UNIT – III : VACUUM AND OXIDATION

History of vacuum technology – units of Vacuum – Kinetic aspects of Gases – Application of Vacuum – Gas flow in vacuum systems – production of vacuum – Measurement of vacuum – Thermal conductivity gauges – Penning Gauge – Oxidation – Oxidation Resistant Materials.

UNIT – IV : NON-DESTRUCTIVE TESTING (NDT)

NDT and its advantages – Defects in materials – Selection of the NDT Method – Visual Inspection – Basic Principle – Liquid Penetration Testing – Physical Principle – Magnetic Particle Testing (MPT) – Principle of MPT – Sensitivity – Limitation – Eddy Current Testing (ECT) – Principle – Instrument for ECT – Applications – Limitations – Radiography – Basic Principle – Application – Limitations.

UNIT – V : ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS

Dielectrics – Polarization – Temperature and frequency effects – Electric Breakdown – Ferroelectric materials – Electrostriction – Piezoelectricity – Uses of Dielectrics – Magnetic Properties – Classification – Magnetostriction – Soft and Hard Magnetic Materials.

Books for study:

1. Materials Science by G.K.Narula, K.S. Narula, V.K. Gupta, Tata McGraw Hill Publishing, 1994.
2. Materials Science and Engineering by V. Raghavan, Prentice Hall of India, 2004.

Books for reference:

1. Practical Non-Destructive Testing by Baldevraj, T. Jayakumar, M. Thanvasimuthu, Narosa Publishing House, Chennai, 2002.
2. Testing of Metallic Materials by A.V.K. Suryanarayana, B.S. Publications, Giriraj lane, Sultan Bazar, Hyderabad – 95, 2003.

PAPER – 2

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FET – Characteristics – parameter FET as amplifier – FET as VVR – MOSFET – Depletion and enhancement – UJT characteristics – UJT as relaxation oscillator – SCR characteristics – SCR as half wave rectifier and full wave rectifier. SCR as static current switch – Firing of SCR using UJT.

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3. Operational amplifier and linear integrated circuits – Prentice Hall Inc. N.J. 1977.

PAPER – 3

LASER AND FIBRE OPTIC COMMUNICATION

UNIT – I: LASER PHYSICS

Basic Principle of Laser – Einstein Coefficients – Condition for light amplification – Population Inversion – Threshold Condition – Line Shape Function – Optical Resonators – Three level and four level systems.

UNIT – II: TYPES OF LASERS AND OUTPUT MODULATION METHODS

Solid State Lasers – Ruby and Nd-YAG Laser – Gas Lasers – He-Ne and Co₂ lasers – semiconductor lasers – Hetero junction Lasers – Liquid Dye Lasers – Q switching and mode locking.

UNIT – III: APPLICATIONS OF LASER

Application of laser in industry – cutting and welding – Drilling – Surface Hardening – Medical applications – Laser as diagnostic and therapeutic tool – Holography – Theory of recording and reconstruction – application of Holography.

UNIT – IV: OPTIC FIBERS

Fiber optic revolution – basic characteristics of optical fiber – acceptance angle – numerical aperture – propagation of light through optical fiber – theory of mode formation – classification of fibers – step index and graded index fibers – single mode and multi mode fibers – losses in fibers – fabrication techniques of fibers.

UNIT – V: FIBER OPTIC COMMUNICATION

Source and detectors for fiber optic communication – Laser and LED – Analog and digital modulation methods – Principle of optical detection – Pin APD photo detectors – Noise – Design consideration of a fiber optic communication system.

Books for study:

1. Laser theory and applications by K. Thyagarajan and Ajoy Ghatak, Cambridge University Press, 1999.
2. Introduction to Fiber optics by K. Thyagarajan and Ajoy Ghatak, Cambridge University Press, 1999.
3. Optical Fiber Communications by John M. Senior, Cambridge University Press, 1996.
4. Fiber-Optic Communication Systems, Govind P. Agarwal, John-Wiley & Sons,

Books for Reference:

1. An Introduction to laser : Theory and Applications by M. N. Avadhanulu, S. Chand and Co., New Delhi 2001.
2. P.K. Palanisamy, Physics for Engineering, Scitech Publishing Pvt. Ltd., Chennai

ELECTIVE

GROUP C

PAPER – 1

FUNDAMENTALS OF NANO MATERIALS AND CHARACTERIZATION

UNIT – I : INTRODUCTION TO NANOTECHNOLOGY

Definition of Nanoscale system – Feymann theory of Nanotechnology – types of nanotechnology – Molecular Nanotechnology – Molecular and atomic size – Surface and dimensional space – opportunities at the Nanoscale.

Unit – 2: NANO PROPERTIES

Forces between atoms and molecules, particles and grain boundaries – Vander Waals and electrostatic forces between surface – Nano and Mesopores – size dependent variation in magnetic, electronic transport, resistivity, optical and etc – Misnomers and misconception of Nanotechnology.

Unit – 3 : QUANTUM CONFINEMENT

Quantum confinement in one dimension – Quantum walls – Quantum confinement – In two dimensions – Quantum wires – Quantum confinement in three dimensions – Quantum dots – Super lattices band – Band offsets – Quantum dot layers.

Unit – 4: SYNTHESIS OF NANOMATERIALS AND ITS CHARACTERIZATION

Basic approaches of synthesis nanomaterials – Bottom up and top down process – fundamental of sol – gel process – Sol – Gel synthesis methods for oxides – Mechanical milling – thermal evaporation – XRD with Debye Scherrer formula – SEM- TEM – FTIR – UV.

Unit – 5: APPLICATION OF NANOMATERIALS

Implications of Drug delivery – Polymeric Nanoparticles as Drug carriers and controlled release implant devices – Magnetic Data Storage – Magneto optics and magneto – optic recording – Nano Sensors – Physical sensor and chemical sensors.

Books for Study & Reference:

1. Nanotechnology : Basic Science and Emergic Technologies – Mick Wilson, Kamli Kannangara, Geoff smith , Michelle Simmons, Burkhard Raguse, overseas press (2005)
2. Nanotechnology : A Gentle introduction to the next big idea, Mark A. Rather, Daniel Rather, Mark Rather, prentice Hall PTR; 1st edition (2002)
3. Robert W. Kel Sall, Mark Geoghenan, In W. Hamley, Nano Scale Science and technology, John Wiley and sons, 2005 ISBN 0470850868.
4. Recent advances I the liquid phase synthesis of inorganic nanoparticles Brain L. Cushing, Valdimir L. Kolesnichenko, Charles J. O* Connor, Chem Rev 104 (2004)3893- 3946.
5. Nano composite science and technology, Palical M. Ajayan, Linda S. Schadles, Paul V. Braues, Wiley – VCH Verlag WEileim (2003).
6. www.eng.vcedu/Ngbeaucag/calsses/XRD/Neutron_diffraction_atLNL.pdf
7. Nano particulates as Dring Carriers , Edited by Vladimir P. Torchilin, Imperiacal college press, North Einstein university, USA (2006), ISBN 1 – 86094 – 630 – 5.
8. Magnetic materials: Fundamental and device applications Nichola. Ann spaldin, Cambridge University press (2003) ISBN 0521016584.

PAPER – 2

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3. Operational amplifier and linear integrated circuits – Prentice Hall Inc. N.J. 1977.

PAPER – 3

MEDICAL PHYSICS

UNIT – I: X – RAYS

Electromagnetic spectrum – production of x- rays – s-rys spectra – Brehmsstrahlung – Characteristic x-ray – X-ray tubes – Coolidge tube – x-ray tube design – tube cooling – stationary mode – Retting anode x-ray tubes – Tube rating – quality and intensity of x-ray. X-ray generator circuits – half wave and full wave fectionification.

UNIT – II: RADIATION PHYSICS

Radiation units – exposure – absorbed dose – rad gray – kera relative biological effectivenss – effective dose – slevert - inverse square law – Interaction of radiation with matter – linear attenuation coefficient. Radiation Detectors.

UNIT – III: MEDICAL IMAGING PHYSICS

Radiological imaging – Radiography – Filters – grids – cassette – X-ray film – film processing – fluoroscopy – computed tomography scanner –principle function display – generations – mammography. Ultrasound imaging – magnetic resonance imaging – thyroid uptake system – Gamma camera [Only Principle, function and display]

UNIT – IV: RADIATION THERAPHY PHYSICS

Radio therapy – kilo voltage machines – deep therapy machines – tele-cobalt machines – Medical linear accelerator. Basic of Teletherapy units – deep x-ray, telecobalt units, medical linear accelerator – radiation protection – external beam characteristics – phantom –does maximm and build up – bolus – percentage depth dose – tissue – air ration – back scatter factor.

UNIT – V: RADIATION PROTECTION

Principles of radiation protection – protective materials – radiation effects – somatic, genetic stochastic and deterministic effect, Personal monitoring devices – TLD film badge – pocket dosimeter.

Book for Study:

1. Basic Radiological Physics Dr. K. Thayalan – Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003)
2. Christensen's Physics of Diagnostic Radiology : Curry, Dowdey and Murrey – Lippincot Williams and Wilkins (1990)
3. Physics of Radiation Therapy : FM Khan – Williams and Wilkins, Third edition (2003)
4. The essential physics of Medical imaging : Bushberg, Seibert, Leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002)
5. HE Johns and Cunningham – The Physics of Radiology.

Books for Reference :

1. Nuclear medicine Physics : Chandra – Lippincot Williams and Wilkins (1998)
2. The Physics of radiology : John R. Gunning and Johns – Charles C Thomas USA (1990)
3. Medical Imaging Physics : William R Hendee – Mosby , 3rd edition (1992)
4. Advanced Medical Radiation Dosimetry : Govindarajan KN Prentice – Hall of India Pvt. Ltd. New Delhi (1992)
5. Eric Hall Radio Biology for the Radiologist – Lippincott Williams & Wilkins.
6. The modern Technology of Radiation oncology – Jake VanDyk – Medical Physics Publishing.

**ALLIED
PHYSICS - I**

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak,Cambridge,University Press(1999).

**ALLIED
PHYSICS II**

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davission and Germer's Experiment – G.P. Thomson's Experiment – Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell –Bravais lattice- structures of simple cubic-BCC and FCC- co ordination number, packing factor calculation for the above structures –Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology– limitations.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
9. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
10. Renewable & Sustainable energy sources – Agarwal.

ALLIED PRACTICAL

PHYSICS

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Rigidity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
8. Sonometer – frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer Grating – Minimum Deviation – Mercury Lines.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT by transistors.
18. Zener diode – Voltage Regulation.
19. NAND / NOR as universal gate.
20. Demorgan's theorem verification.

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SOCIAL WORK

DEGREE COURSE UNDER CBCS

(with effect from 2017-2018)

The course Structure and the Scheme of Examination

| S. No | Part | Study Components | | Ins. Hr / Week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|------------------|---------|----------------|--------|-----------------------------|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | | |
| 1 | I | Language | Paper-1 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 2 | II | English | Paper-1 | 6 | 4 | English | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-1 | 6 | 4 | Introduction to Social Work | 25 | 75 | 100 |
| 4 | III | Core Theory | Paper 2 | 6 | 4 | Indian Social Problems | 25 | 75 | 100 |
| 5 | III | Allied | Paper-1 | 4 | 3 | Structure of Indian Society | 25 | 75 | 100 |
| 6 | IV | Environ. Studies | | 2 | 2 | Environmental Studies | 25 | 75 | 100 |
| Total | | | | 30 | 21 | | 150 | 450 | 600 |
| SEMESTER II | | | | | | | | | |
| 7 | I | Language | Paper-2 | 6 | 4 | Tamil / Other Languages | 25 | 75 | 100 |
| 8 | II | English | Paper-2 | 6 | 4 | English | 25 | 75 | 100 |
| 9 | III | Core | Paper-3 | 5 | 4 | Direct Methods of Social | 25 | 75 | 100 |

| S. No | Part | Study Components | | Ins. Hr / Week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------|---------------------|---------|----------------|--------|--------------------------------|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| | | Theory | | | | Work | | | |
| 10 | III | Core Theory | Paper 4 | 5 | 4 | Human Growth and Development | 25 | 75 | 100 |
| 11 | III | Allied | Paper-2 | 4 | 4 | Introduction to Counselling | 25 | 75 | 100 |
| 12 | IV | Value Education | | 2 | 2 | Value Education | 25 | 75 | 100 |
| 13 | | Soft Skill | | 2 | 1 | Soft Skill | 25 | 75 | 100 |
| Total | | | | 30 | 23 | | 175 | 525 | 700 |
| SEMESTER III | | | | | | | | | |
| 14 | I | Language | Paper-3 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 15 | II | English | Paper-3 | 6 | 4 | English | 25 | 75 | 100 |
| 16 | III | Core Theory | Paper-5 | 4 | 4 | Social Legislations | 25 | 75 | 100 |
| 17 | III | Core Theory | Paper-6 | 4 | 4 | Theories of Social Work | 25 | 75 | 100 |
| 18 | III | Allied | Paper-3 | 4 | 3 | Fundamentals of Statistics | 25 | 75 | 100 |
| 19 | IV | Skill Based Subject | Paper-1 | 3 | 2 | Disaster Management | 25 | 75 | 100 |
| 20 | | Non Major Elective | Paper-1 | 3 | 3 | Computer and Office Automation | 25 | 75 | 100 |
| Total | | | | 30 | 24 | | 175 | 525 | 700 |
| SEMESTER IV | | | | | | | | | |
| 21 | I | Language | Paper-4 | 6 | 4 | Tamil/Other Languages | 25 | 75 | 100 |
| 22 | II | English | Paper-4 | 6 | 4 | English | 25 | 75 | 100 |
| 23 | III | Core Theory | Paper-7 | 4 | 4 | Community Development | 25 | 75 | 100 |

| S. No | Part | Study Components | | Ins. Hr / Week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------|---------------------|----------|----------------|--------|--|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| 24 | III | Core Theory | Paper-8 | 4 | 4 | Social Work in Hospitals | 25 | 75 | 100 |
| 25 | III | Allied | Paper-4 | 4 | 3 | Demography and Population Dynamics | 25 | 75 | 100 |
| 26 | IV | Skill Based | Skill-2 | 3 | 3 | Community Programmes and NGO’S | 25 | 75 | 100 |
| 27 | | Elective | Paper-1 | 3 | 3 | Family and Child Welfare | 25 | 75 | 100 |
| Total | | | | 30 | 25 | | 175 | 525 | 700 |
| S. No | Part | Study Components | | Ins. Hr / Week | Credit | Title of the Paper | Maximum Marks | | |
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER V | | | | | | | | | |
| 1 | I | Core Theory | Paper-9 | 6 | 4 | Fundamentals of Social Work Research | 25 | 75 | 100 |
| 2 | II | Core Theory | Paper-10 | 6 | 4 | Social Welfare Administration | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper-11 | 6 | 4 | Development Communication | 25 | 75 | 100 |
| 4 | III | Elective | Paper-2 | 6 | 4 | Entrepreneurship Development | 25 | 75 | 100 |
| 5 | III | Non Major Elective | Paper-2 | 3 | 4 | Women and Development | 25 | 75 | 100 |
| 6 | IV | Skill Based Subject | Paper -3 | 3 | 3 | Project Management | 25 | 75 | 100 |
| Total | | | | 30 | 23 | | 150 | 450 | 600 |
| SEMESTER VI | | | | | | | | | |
| 1 | I | Core Theory | Paper-12 | 6 | 4 | Medical Social Work | 25 | 75 | 100 |
| 2 | II | Core Theory | Paper-13 | 6 | 4 | Social Work in Industries | 25 | 75 | 100 |
| 3 | III | Core Theory | Paper- | 6 | 4 | Social Work with Persons with Disabilities | 25 | 75 | 100 |

| S. No | Part | Study Components | | Ins. Hr / Week | Credit | Title of the Paper | Maximum Marks | | |
|-------|------|----------------------|----------|----------------|--------|----------------------------|---------------|-----------|-------|
| | | Course Title | | | | | CIA | Uni. Exam | Total |
| | | | 14 | | | | | | |
| 4 | III | Core Theory | Paper-15 | 6 | 4 | Correctional Social Work | 25 | 75 | 100 |
| 5 | III | Elective | Paper-3 | 3 | 4 | Human Rights | 25 | 75 | 100 |
| 6 | IV | Skill Based Subject | Paper-4 | 3 | 3 | Fundamentals of Accounting | 25 | 75 | 100 |
| | | Extension Activities | | 0 | 1 | | 100 | - | 100 |
| Total | | | | 30 | 24 | | 250 | 450 | 700 |

| Part I | Subjects | Papers | Credit | Total Credits | Marks | Total Marks |
|----------|---------------------|-----------|--------|---------------|-------|-------------|
| Part I | Languages | 4 | 4 | 16 | 100 | 400 |
| Part II | English | 4 | 4 | 16 | 100 | 400 |
| Part III | Allied (Odd) | 2 | 3-4 | 7 | 100 | 200 |
| | Allied (Even) | 2 | 3 | 6 | 100 | 200 |
| | Electives | 3 | 3-4 | 11 | 100 | 300 |
| | Core | 15 | 4 | 60 | 100 | 1500 |
| Part IV | Environment Studies | 1 | 2 | 2 | 100 | 100 |
| | Soft Skill | 1 | 1 | 1 | 100 | 100 |
| | Value Education | 1 | 2 | 2 | 100 | 100 |
| | Non Major Elective | 2 | 3-4 | 7 | 100 | 200 |
| | Skill Based | 4 | 2-3 | 11 | 100 | 400 |
| Part V | Extension | 1 | 1 | 1 | 100 | 100 |
| | Total | 40 | | 140 | | 4000 |

SEMESTER – I

INTRODUCTION TO SOCIAL WORK

UNIT 1: Social Work – meaning & definition, objectives, functions and Professional ethics, Social welfare-meaning, scope & objectives -Social service – meaning, difference between social services and social work. Social security, social justice and social action. Historical development of social work in the west and in India.

UNIT 2: The rights of the individuals under the United Nations Charter of Human Rights and the Indian Constitution.

UNIT 3: Socio- Religious thoughts of India:

Hinduism (Four values) Dharma, Artha, Kama & Moksha

Christianity - Supreme value of man, Concepts of love & services.

Modern Indian Social thought – Vivekananda, Aurobindo, Gandhi & Radhakrishnan.

UNIT 4: Role of State, Central Government and Voluntary agencies in developing social welfare.

UNIT 5: Role of Social worker in various settings. Child welfare, youth welfare, aged welfare, family welfare, medical setting, Psychiatric setting & Labour welfare.

REFERENCES

1. Friedlander, W.A., Introduction to Social Welfare, New Delhi, Prentice Hall, 1977
2. Indian Nationalism and Hindu Social Reform, Bombay, Oxford University Press – 1964 Heimsath, C.H.
3. Muzunden, A.M., Social Welfare in India, Bombay, Asia Publishing House, 1964
4. Routledge and Kegan Paul, 1968 – Woodroof, E.K., From Charity to Social Work, London,
5. Turner F.J., Social Work Treatment, New York, Free Press, 1974
6. Prabhu, Radharinath. Hindu Social Organisation (Bombay:Popular)
7. SAMA, D.S. Hinduism through the ages (Bombay, Bharatiya Vidhya Bhavan)
8. Natarajan,S. Century of Social Reforms (Bombay: Asia Publishing House)
9. Sudha .J.P Religion in India (New Delhi: Sterling Publishers Pvt.Ltd.)
10. Radhakrishnan.S Hindu view of life (Bombay: George Allennuina)
11. Rameshwari Devi ,Ravi Prakash Social work and Social Welfare Administration (Methods and Practice) Vol I and Vol II, Mangal Deep Publication, Jaipur,1998
12. S.D.Mudgal, An Introduction to Social work, Book Enclave, Jaipur, 1997.
13. Jainendra Kumar, An Introduction to Social Work, Anmol Publication Pvt, Ltd., New Delhi 2002

INDIAN SOCIAL PROBLEMS

UNIT 1:

Poverty and dependency: Definition, Relation between poverty and dependency - Classes of dependence – Care of the dependents. Factors responsible for poverty and dependency. Measures to eradicate poverty and dependency in India.

UNIT 2:

Beggary : Definition – Causes of beggary – types , ways and means of preventing beggary. Rehabilitation measures of the government.

UNIT 3:

Prostitution : Definition, Types, Causes – Implications of prostitution and rehabilitative measures.

UNIT 4:

Alcoholism and drug addiction : Alcoholism – causes / implications of drinking and prevention – prohibition, causes of success & failure of prohibition, drug addiction – types of drugs – Causes of addiction and teenagers – effects - remedial measures and de-addiction.

UNIT 5:

Juvenile delinquency: Definition –Causes – consequences of juvenile delinquency, vagrancy, truancy, street children – prevention – reformation of delinquents.

TEXT BOOK: Madan.G.R.Indian Social Problems

REFERENCE:

1. Merton, Robert.K and Nisbet Robert Lemert, Contemporary Social Problems Ny: Hard Course Brace 1965.
2. Lemert, Social Pathology Ny, Hard Couse Brace 1962. (1978 Reprint).
3. Athreya, Venkatesh B Sheela Rani Chuukkath. Literacy and Empowerment Sage Publishing , New Delhi, 1996.
4. Williams Kornblum, Joseph Julian, Social Problems, 8th Edition, Prentice Hall Inc., 1975.
5. Dr. Sunil, Social Problems in India – Issues & Perspectives, Regency Publications House, New Delhi, 1990.
6. Bharti Sharma, Juvenile Delinquents and their social culture, Uppal Publishing House, New Delhi, 1990.
7. S.K. Bhattacharya, Social Problems in India – Issues and Perspectives, published by Regency Publications, New Delhi.

ALLIED – 1

STRUCTURE OF INDIAN SOCIETY

UNIT 1: Social Work its relationship with social sciences. Society: Definition and Concepts of society, community, social groups, Associations and Institutions.

UNIT 2: Culture: Definition and Concepts of Culture and civilization, Norms, Folkways, Institutions and laws, Role and Function of culture.

UNIT 3: Social Stratification: Concept, Determinants, Caste, Class and Race.

UNIT 4: Family: Structure and Functions of Family, Types, influences of other agents of socialization, changing Indian Family and its consequences on the individual and society, Family disorganization.

UNIT 5: Social Control: Definition, Social Change: Concept, Process, Factors acting as agents of Social change.

REFERENCES

1. T.B.Bottomore, Sociology: A Guide to Literature and problems, New Delhi, Allen and Unwin (India) 1972.
2. K.M.Kalpadia, Marriage and Family in India, London, Oxford University Press, 1965.
3. Mac Iver and Page, Society, Macmillan and co., 1959.
4. Sharma, Introduction to Sociology, Sterling Publishers.
5. Srinivas, M.N.Caste in Modern India, Asia Publishing House, 1962.
6. Tumin.M. Social Stratification New Jersey: Prentice Hall, 1981.
7. Kumar S.Principles of Sociology, New Heights publishers and Distributors. New Delhi, 1982-83.
8. Social Control & Social Change – K.Singh Published by Prakashan Kendra – Lucknow, 2001.
9. Sachchidanandananda, Social Change in Village India. Published by AshokKumar Mittal Concept Publishing Company.
10. A. Kumar, Structure of Society, Anmol Publications, New Delhi.
11. Vidhya Bhusan & Shachdeva, An Introduction to Sociology, Kita Mahal Publications, Allahabad.

SEMESTER – II

DIRECT METHODS OF SOCIAL WORK

UNIT 1: Social Case Work – Definition, objectives, principles and basic concepts. Interviewing : Study, Diagnosis and Treatment .

UNIT 2: Social Group work – Definition, objectives, principles: Types of groups, Group processes: Group work Processes

UNIT 3: Community organization – Definition of Community organization, Principles, process of community organization and resource mobilization, Role of a community organization worker.

UNIT 4: Social case Work practice in Medical / Psychiatric/ Industrial / School settings and roles of case worker

UNIT 5: Social group work practice in Medical/ Psychiatric/ Industrial / School settings and roles of group worker.

REFERENCES

1. M.S.Gore, Social work education, Asia Publishing House 1965:
2. Gisela Konapka Social Group Work, A helping process, New Jersey Prentice Hall:.
3. Fred Milson ,Skills in Social group work.
4. Gangrade, K.D.Community Organisation in India (Bombay: Popular Prakashan)
5. Social Work and Community Development, Institute for Substantiable Development, Lucknow, First Edition 2002. Published by J.L. Kumar for Anmol Publications Pvt. Ltd., New Delhi.
6. P.D.Misra, Social Work Philosophy and Methods, Inter India Publications, New Delhi.

HUMAN GROWTH AND DEVELOPMENT

Unit 1: Growth and Development

Meaning of Growth and Development, Development tasks, Development stages. Conception pregnancy & Delivery.

Infancy: Major adjustment of infancy.

Babyhood: Emotional behaviour in babyhood – Hazards of babyhood.

Early childhood: Emotional and Social Behaviour.

Late childhood: Emotional and Social Behaviour.

Unit 2: Puberty

Causes and age of puberty – Body changes at puberty – effects of puberty changes, adolescence – Developmental tasks of Adolescence, Emotional, Social aspects of adolescence.

Unit 3: Early and Late Adulthood.

Developmental tasks of Early Adulthood – Vocational, marital, social Adjustment – Late Adulthood – Adjustment to parenthood.

Unit 4: Middle Age.

Developmental tasks of middle age – social adjustment – Adjustment to physical changes – vocational and marital hazards of middle age.

Unit 5: Old Age

Characteristics of old age – Development task of old age, adjustment to retirement – Adjustment to loss of spouse – Life hazards of old age.

Text book

Elizabeth B. Hurlock, Development of psychology, Tata Mc Graw Hill & Pub. Cooperation Limited, New Delhi, 2002.

References:

English Osey, Emotional problems of living London: George Allen and Alwin Limited, 1958.

Hurlock E.B., Developmental psychology, 1975.

Thompson, C.G., Child Psychology, New Delhi, Sorject Publications, 1981.

Qamar Hasan, Personality Assessment – A French Psychological Look, Gyan Publishing house, New Delhi, 1997.

Lawrence, Adult Personality Development, Theories and concepts, S. Wrightsman, Sage Publications, New Delhi, 1994.

Alice Eagly H. & Shelly Chiken, The Psychology of Attitudes, Harcourt Brace Jovanovich college publishers, New York, 1993.

ALLIED - 2

INTRODUCTION TO COUNSELLING

Unit 1: Introduction to Counselling: Meaning, definition, need and importance of counselling & professional ethics in counselling.

Unit 2: Basic Principles of Counselling: Participation, individualization, confidentiality, communication, acceptance, self-confidence, self-awareness and other principles governing the counselling relationship.

Unit 3: Counselling process, interview and its significance in counselling- Use of observation in counselling and understanding of emotion in counselling.

Unit 4: Techniques of group counselling, strategies and structure- barriers to effective Counselling sessions: Counselling evaluation.

Unit 5: Components of effective counseling; Personality of the counselor's skills- Role and functions of the counselor in schools, industries, family, hospitals & rehabilitation institutions.

References:

1. Burnett.J : Counselling with young people
2. Fred Machinery: Counselling for personal Adjustment
3. Morrisco C. Engine: Counselling with Young people
4. Shesrom Everlett, Brammer M.Lawrence: The Dynamics of counselling process
5. Tobbert,E.L: Introdution to counselling
6. Colin Feltham, Controversies in psychotherapy and counselling, Sage publications, New Delhi, 1999.
7. Kathryn Geldard & David Geldard, Counselling Children, A pratical Introduction, Sage Publications,New Delhi, 1997.
8. Charles J.O.leary, Counselling Couples and Families. A Person centred Approach, sage Publications, New Delhi,1999.
9. Keith Tudor, Group Counselling, Sage Publications, New Delhi, 1999.
10. Don. C.Locke, Jane, E.Mayers, Edwin I.Iless, the Hand book of Counselling, Sage publication, International Educational and professional Publishers, New Delhi-2001.
11. Tara Chand Sharma, Modern Methods of Guidance and Guidance and Counselling Sarup & Son's, New Delhi 2002.

SEMESTER – III
SOCIAL LEGISLATIONS

Unit 1:

The concept of legislation, need and importance to legislation, legislation as a process, social welfare and social change – Direct principles of state policy.

Unit 2:

The Hindu and Muslim Laws governing marriage, divorce, adoption, minority and guardianship, maintenance, succession and inheritance.

Unit 3: Legislation Relating to the Welfare of Women.

Dowry Prohibition Act – 1961, Suppression of Immoral Traffic Act – 1977, Medical Termination of Pregnancy Act – 1971.

Unit 4: Legislation Related to Child

Juvenile Justice Act – 1986, Child Marriage Restraint Act – 1929 and Child Labour (Prohibition and Regulation) Act – 1986.

Unit 5: Legislation for the Amelioration of Social Problems

Protection of civil Rights Act – 1976, Consumer protection Act – 1986, Mental Health Act – 1987 and Beggary Prevention Act.

References:

1. Government of India, Social legislation – Govt.of India Publications – 1956.
2. Tandon.M.P., Mohamedanlan – Allahabad, Lan Association, 1964.
3. Hindulaw – R.K.Agarwala, Central law agency, Allagabad.
4. Senewalla R.K., Tara Poralla D.H. & Sons, Law other Layman _ Bombay 1962.
5. Devasia, V.V., Leelamma Devasia, Woman Social Justice and Human Rights, APH Publishing corporation, Delhi, 1998.
6. Child and Law – Indian Council for Child Welfare, Tamil Nadu, 1998.
7. Sankar Sen, A.P.H. Human Rights in Developing Society – Publishing Corporation, New Delhi, 1998.
8. Kohki, A.S., Sharma, S.R., Equal Oppurtutnity Human Rights and Social Welfare, Anmol Publications, Pvt.,Ltd, New Delhi,1997. Justice V.R.Krishna Iyer, Human Rights – A Judges Miscellanary, B.R.Publishing Corporation, Delhi, 199
9. Vyas, R.N. – The Soul of Indian Constituion (A Critical evaluation) print well Publications, Jaipur, 1998.
10. Jagadeesan Elatchiappearr Marriage and Social Legislations in Tamil Nadu, Madras-7.
11. Chkaraparty N.K Juvenile Justice, Deep & Deep Publication, New Delhi 1999.
12. Paras Diwan & Peeyusai Diwan, Children & Legal Protection, Deep & Deep Publication, New Delhi, 1994 .
13. Shanmuga Velayudam, Social Legislation and Social Change, Vazla Valamada Publications, 2000Chennai.

THEORIES OF SOCIAL WORK

Unit 1: Theory in social work

Theory – Definition, functions, characteristics – relevance and importance of theory in Social Work.

Unit 2: Role Theory

Meaning – Concept of Role in Social Work – role conflict – Application of Role Theory in Social Work.

Unit 3: Gestalt Theory

Introduction – Origin of Gestalt theory – its impact on social work practice – Treatment methods and techniques.

Unit 4: Crisis Theory

Introduction – origin of crisis theory – sociological studies in crises theory- Social work & crises theory – social work practice in crises situation –Treatment in crises theory.

Unit 5:

Psycho-analytic theory & Social work practice.

References:

1. Ministry of Social Welfare, The Encyclopedia of social work in India.
2. Tripathy .B.D.Nature of Sociological Theories, New Delhi: Sterling Ltd.,
3. Turner J.Franca, A social work treatment, New York: the free press 1979.
4. Colemann: Abnormal Psychology.
5. Mangal S.k., Abnormal Psychology, Sterling Publishers Private Limited.
6. Francies, G. Abraham, Sociological Theory, Oxpord Press University Press, New Delhi.

ALLIED - 3

FUNDAMENTALS OF STATISTICS

Unit-1: Statistics: definition, objectives, uses in social work, classification of data – meaning, objectives, types, formation of discrete, continuous, relative, and bivariate frequency distribution.

Unit 2: Tabulation: meaning, types, and parts of a table, difference between classification and tabulation; general rules of tabulation.

Unit-3: Measures of Central tendency: mean, median, and mode.

Unit-4: Measures of Dispersion: range, inter quartile range, quartile deviation, Mean deviation and Standard deviation, Lorenz curve.

Unit-5: Diagrammatic and graphic presentation: types – one dimensional, two dimensional, pictographs, cartogram, techniques of constructing graphs, histogram, frequency polygon, smooth frequency curve, and ogives.

Text book: Gupta, S.P. (1992). *Elementary Statistical Methods*. New Delhi: Sultan Chand & Sons.

References:

1. Anderson.T.W.,Introduction to Multivariate Statistical Analysis, New York :
2. John Wiley & Sons Chou, Y. (1975). *Statistics Analysis*. New York: Reinhart and Winston
3. David, J. (2009). *Statistics: A Very Short Introduction*. New York: Oxford University
4. Press. Gupta, S.C. (1993). *Fundamentals of Applied Statistics*. New Delhi: Sultan
5. Chand & Sons, Gupta, S.C. (2002). *Statistical Methods*. New Delhi: Sultan Chand & Sons.
6. Guthrie, G. (2010). *Basic research methods: An entry to social science research*. SAGE Publications India.
7. Mueller, John H., Schussler Karl F., and Costner, Herbert .L. Statistical Reasoning in Sociology, Boston: Houghton Mifflin, 1970.
8. Nagar. A.L. & Das, R.K. (1993). *Basic Statistics.*, New Delhi: Oxford University
9. Press. Salvatore, D. (1982). *Statistics and Econometrics*. New Delhi: McGraw Hill.
10. Speigal, M.R. (1992). *Theory and Problems of Statistics*. London: McGraw Hill Book Co.
11. Stigler & Stephen, M. (2002). *Statistics on the Table: The History of Statistical Concepts and Methods*. Cambridge: Harvard University Press

SKILL BASED SUBJECT – 1
DISASTER MANAGEMENT

Unit-I: Disaster

Definition, hazards, Vulnerability and Disaster cycle. Key agents in disaster management- Dimensions of Disaster Management

Unit-II

Response to Disasters-survey, assessment, importance & scope /basics of planning, sources of information- nature of crisis information, communication, and co-ordination of information man and management- disaster planning- early warning systems, managing human awareness, Vulnerability analysis.

Unit-III

Disaster- Indian experience

Nature Disaster- Floods/drought/cyclone/earthquake disaster – communal violence/ Ethnic conflicts/ refugees.

Other disaster- epidemic/fire/industrial disaster/ road accidents/ air accidents/railway accidents.

Unit-IV

Indian Disaster Management- Role of central state governments-role of NGO's in disaster management- role of media in disaster management-role of education in training and management.

Unit-V

Tsunami-Reality/ Facts/ Responses

Role of local/ state/ National International/ NGO's& Role of social workers.

References:

1. Shailendra K.Singh, Subhash C.Keradu, Shoba Singh Handbook of modern Management Miffal publications, 1998 New Delhi-110059
2. Parasuram. S and Unnikrishnan. P.V Oxford University press, YMCA, library building, Jai singh Road, 2000 NewDelhi-110001
3. Sachdeva J.L., Indian Journal of Adult Education, Vol. %9, NO-3 July- September 1998.17-B,Indra prastha Estate, New Delhi-110 002.

NON MAJOR ELECTIVE - 1

COMPUTER AND OFFICE AUTOMATION

UNIT I

Introduction to computers- definition, evolutions, generations, types of computers- Analog, digital and hybrid and special purpose, micro mini, main frame computers.

UNIT II

Hardware, block diagram of computer, I/O devices, memories –primary –RAM, ROM, EPROM, EEPROM, secondary storage devices.

UNIT III

Software, definition, categories – System, Applications, Programming Languages, Packages, O.S- Evolution, Single users Vs Multi users, Time sharing Multi Program, Multi-tasking, Multi processing, basic commands of MS –DOS &UNIX /NOVELL.

UNIT IV

Problem Solving through basic algorithms, Flow chart, Symbols, Simple algorithms to illustrate the problem solving technique. Basic language- constant, variables, key words, built in functions, control statements, arrays, subscripts, user defined functions and sub programmes.

UNIT V

M.S WORD – basics, using of text, word editing techniques, using templates.

M.S Power point – basics-, editing text, adding subordinate points, Running an Electronic slide show.

MS Excel- entering data, selecting ranges, creating graphs.

Use of Inter Net Explore.

References:

Texaliny. R.K (1998): P.C Software for Windows made Simple. New Delhi: Tata Mc Graw Hill

SEMESTER – IV

COMMUNITY DEVELOPMENT

Unit 1: Community Development

Definition, Meaning, Concept, history, philosophy, objectives and principles of community development in India.. Rural Urban contrast.

Unit 2: The Role of Nucleus groups in Rural Development

Formation of Nucleus group in Rural Development, the power structure, Social action, characteristics of nucleus group members, people's participation & Social education – Scope, concept, aims and problems, methods – adult literary methods.

Unit 3:

Community Development Process & Role of Community Development Worker.

Unit 4: Rural Community development

Scope, Features and problems. Rural Community Development Programmes – Government & Voluntary agencies – NIPCCD, CAPART, NABARD, PADI, DRDA.

Unit 5: Urban Development Programme

Agencies – CMDA, DDA, Tamil Nadu Urban Development Project (TNUDP), Municipal Administration, Housing development agencies, etc. Role of state Government & NGO's in Urban Development.

References:

1. Jain S.C., Community Development and Panchayat Raj in India.
2. Rajeswari Deyal, Community Development Programme in India.
3. Mukeriji, B., Community Development in India, New Delhi, Orient Longmans.
4. Dahema O.P., Extension and Rural Welfare, Ram Prasad & Sons, Agra – 3.
5. Eminger, Dognals, A guide to community Development, Ministry of Community Development.
6. Jain S.C. Rural Development Institution & Strategies, Rawat Publications, Jaipur, 1985.
7. Sethuramalingam. V, Urban Housing: Policies. Programmes and Interventions, S.S. Pub, Trichirappalli, 2000.

SOCIAL WORK IN HOSPITALS

UNIT I

Hospital – meaning –definition, nature and functions of hospital- classification of hospitals-based on objectives, based on ownership, based on system of medicine and based on the size of hospitals.

UNIT II

Different departments required in a hospital- out patient – in patient services emergency care – laboratory facilities required – dietary services – Medico legal cases.

UNIT III

Hospital Administration- Meaning, nature and scope. Human resource management in Hospitals- selection, promotion, transfer, performance appraisal, working hours, leave rules, safety, salary and wage policies, training and development.

UNIT IV

Record management in hospitals – essentials of records management- content of medical record- advantages of record keeping- use of computers in Hospital.

UNIT V

Use of social work method in Hospital setting – Role and functions of medical social worker in hospital setting- Importance of team work in a hospital

References:

1. Benjamin Robert,etal 1983 Hospital Administration New Delhi: Prentice.
2. Goal S.L 1981 Health care Administration New Delhi: Sterling.
3. Rabick & Jonathan,etal 1983 Hospital organization and Management
4. London: Spectrum.

ALLIED - 4

DEMOGRAPHY AND POPULATION DYNAMICS

UNIT 1:

a) Definition – Nature – Importance and scope of the study – Relations with other discipline. b) Basic Demographic concepts: Ratio – proportion – percent rate – Natural increase – Fecundity.

UNIT 2:

Theories of Population: Malthusian theory – Optimum theory - Biological Theories – Socio Economic Theories.

UNIT 3:

Composition of population: Rural urban composition – Sex composition – Age composition – Religious composition – Class composition.

UNIT 4:

Population growth in India : Contemporary trend in population growth – Causes effects.

UNIT 5:

Population policy and control in India: Population policy of India – Family Welfare planning programmes in India – Measures of Population Control.

REFERENCES:

1. Agarwala, S.N. India's Population Problems, Tata Mc Graw Hill, New York.
2. Raj, Huns. Population Studies, Surgeet publications, Delhi, 1988.
3. Chandrasekar, S. Infant Mortality population growth and family planning in India, London George Allen Unwin Ltd., 1972.
4. Base Ashish and Desai P.B. Studies in Demography Essays presented in honour of prof. S. Chandrasekar, London, Allen & Unwin and chopal Hill University, North California press, 1971.
5. Krishna Reddy M.M. Marriage population and Society – Kanishka Publishers, New Delhi, 1998.
6. Krishna Reddy M.M. Population and Society in India, Kanishka Publishers, New Delhi, 1998
7. Population Transition in India Vol I & Vol II – Singh Pram Bhatia Bose, B.R. Publishing corporation, New Delhi, 1989.
8. The Billings Method – Dr. Evelyn Billings Ann Westmore, Randon House, New York, 1981.
9. Fertility Status of Women – G.A. Siddique, Published by Rohit Publications, 4675/21, Ansari Road, Durya Ganj, New Delhi – 02, 2001.

SKILL BASED SUBJECT – 2

COMMUNITY PROGRAMMES AND NGOs

Unit – I

Social Enterprise: history, role, importance, need and relevance; Role of NGOs in population activities: health, education, empowerment and development.

Unit-II

Self Help Groups: concepts, objectives, origin; Formation of Self Help Groups: principles, need and stages in the formation, criteria for membership; Guidelines for the formation of Self Help Groups.

Unit – III

Community Health: meaning, definition, health as a fundamental right; Public health; Personal and Environmental Hygiene; Communicable and Non-communicable diseases; prevention and control; Indicators of Health; Public Health Organisation.

Unit – IV

Nutrition: concepts, processes, types of food; Nutrients: functions and sources; Balanced diet: Malnutrition Deficiency diseases; prevention and control; Applied Nutrition Programmes.

Unit – V

Health Care: Concepts, health care services, Primary Health Care, present level of health care; Health Education: principles and means; National Health Programmes: ICDS, Balwadi and Anganwadi programmes; Expanded Programme of Immunization, National Programme for the control of blindness; STD control programme, National AIDS control programme.

Suggested Readings

1. Action Aid. *Annual Report 1994-95*.
2. Oxfam. *Annual Report 1994-95*.
3. NGO: *Guidelines for Good Policy and Practice*. UG: The Common Wealth Foundation.

ELECTIVE – 1

FAMILY AND CHILD WELFARE

Unit 1:

Philosophy of family and child welfare- National child welfare policy in India

Unit 2:

Problems of children – child abuse, child labour, street children- female infanticide, girl children.

Unit 3:

Family welfare planning programme and methods of family planning- natural family planning methods- artificial methods.

Unit 4:

Family and child welfare services by social welfare and other departments of government.

Unit 5:

Role of voluntary agencies in family and child welfare services Institutional and Non-Institutional services for family and child welfare, national and international organisations working for children in India.

References:

1. Bee Dell, C. 1970, Residential life with Children London: Routledge and Kegan Paul.
2. Daridson. F and Gornicki. B 1964, Care of Children in day centers Geneva W.H.O., Publications.
3. Deranandan and Thomas, M.M.1959, changing Pattern of Family in India, Bangalore press.
4. Gokkale S.D and Lohani N.K.1979, Child in India: Bombay Lomaria Publication.
5. Girija Khanna and Varghesu M.A.1978, Indian women today, Delhi Vikas Publications.
6. Rudolf C.Heredia, The Family in changing World, Edward Mathias, Indian Social Institute, New Delhi, 1995.
7. Aruna Khas Giwala, Family Dynamics, Anmol Publication, New Delhi.
8. Digumarti Bhaskara Rao, Care the Child Vol I and Vol II, Discovery Publishing House, New Delhi, 1997.
9. Laxmi Devi, Encyclopaedia of Child and Family Welfare Vol I & II, Institute for Sustainable Development, Lucknow and Anmol publication, New Delhi.

SEMESTER – V

FUNDAMENTALS OF SOCIAL WORK RESEARCH

Unit 1:

Importance of Research in Social Work Profession. Differences between Social research & Social work research.

Unit 2:

Definition and importance of Research Designs, objectives, steps in research design, types of research designs – Definition, objectives, steps, advantages and disadvantages, problems in designing research.

Unit 3:

Social Survey and Case Study – definition – objectives and process.

Unit 4:

Sampling and Sample design – Probability and non-probability types, meaning, process, advantages and disadvantages.

Unit 5:

Tools of data collection – observation, interview schedule, questionnaire, interview guide; pilot study – Definition, objectives, purpose; pretest: Definition, objectives, purpose, process. Research report preparation. Central tendency and Measures of dispersion.

References:

1. Naikiran S., & Selvaraju R., Research Methods in Social Science, Himalaya Publishing House, Mumbai – 04, 1st Edition 2001.
2. Krishnaswami O.R., Methodology of Research in Social Sciences, Himalaya Publishing House, Mumbai – 04, 2001.
3. Goode William and Halt, Methods in Social Research.
4. Pauline Young, Scientific Social Surveys and Research.
5. Norman Polansky, Social Work Research.
6. Kothai C.R., Research Methodology Methods and Techniques.
7. Moser C.A. and Kalton .G., Survey Methods in Social Investigation.
8. Hebert and Blaodo, Social Research.
9. Sharma B.A.V., Reserch Methods in Social Sciences.
10. Gupta. S.P. Statistical Methods, New Delhi, Sultan chundand Sons, 1988.
11. Allen Rubin & Earl Babbie, Research Methods for Social Work, Books/ Cole Publishing Company, 1993.
12. David Hall & Irene Hall, Practical Social Research, Macmillan Press Ltd., 1996.
13. Singh A.K., Bharathi, Tests, Measurements and Research methods in behavioural Sciences Bhavan Publishers/Distributors, 1997.

SOCIAL WELFARE ADMINISTRATION

Unit 1: Administration: Concept, importance, definition, goals, type of administration, definition and nature of social work administration.

Unit 2: Basic Administrative Processes: Planning, Organizing, Staffing, Decision Making, Coordination, Recording and Budgeting, Communication.

Unit 3: Personnel Administration: Staff selection, Induction, Training, Orientation, Placement, Service conditions, Discipline, staff morale, Supervision and Evaluation.

Unit 4: Public Relations: Meaning, Need for Public relations, Principles, use of different media, fund raising.

Unit 5: Voluntary Organisations: Registration and role of voluntary organization in social welfare: Functioning of Boards and committees.

REFERENCE:

1. Kulkarani. Dm, essays in Social Administration.
2. Urwick.L, the elements of Administration.
3. Fraser Moore, Public Relations.
4. Arthur Denhen, Administration.
5. Jain S.P., Social Welfare Administration.
6. Paul Chowdary, Social Welfare Administration.
7. Elwood Stree, Social Agency Administration.
8. Hall, P.L.Public Administration.
9. Sachadeva, D.R. Social welfare Administration –in India, Kitab Mahal New Delhi, 1998.
10. Pat Young, Mastering Social welfare, Mc Millan Press Ltd., London,2000.

DEVELOPMENT COMMUNICATION

Unit 1:

Communication: Concept, definition and purpose; Need and importance of communication.

Unit 2:

Types, Principles and models of communication: Communication process: Channels and stages of communication: Skills and techniques of communication, Communication media and its role; Role of language in communication.

Unit 3:

Communication with self-concept of self-growth – goals of interpersonal communication, Interviews, Non – verbal communication in small groups.

Unit 4:

Mass communication for social change and social action; Types of mass media, selection of suitable approaches and media for different target groups.

Unit 5:

Written communication – Types, guidelines in developing different types of written communication.

References:

1. Dahama, O.P., Communication for education, New Delhi, JCH.
2. Berlo David.K: the process of communication. An Introduction to theory and practice, New York, Holt Rinehart and Winston Inc.
3. Nalini Vittal: Communication for Rural Development in India: some facts, Hyderabad HIRD.
4. Schram willur : Mass communication Urban. (A university of Illinois press)
5. Tunitall. J (ED): Media Sociology: Reader London constable.
6. Singh K.N & Singh S.N –Effective communication media for Rural Audiences (Bombay : Dharmmal Morarji Chemical CO.Ltd.,)
7. Rogers E.M & Shoemaker F.F : Communication of innovations, A cross cultural approaches.
8. Developing Communication Skills, Krishna Mohan Meera Banerji, Birla Institute of Technology and Science, Pilani, 1990.
9. Rayudu C.S., Communication, Himalaya Publishing House, Mumbai.
10. Singh U.K. Sudarasan K.N., Broadcasting Education, Discovery Publishing House, New Delhi.

ELECTIVE – 2

ENTREPRENEURIAL DEVELOPMENT

UNIT I

Concept of entrepreneurship- Definition, characteristics and functions of entrepreneur- types of Entrepreneur- Need for training and development- EDP- Phases of EDP- Development of women Entrepreneurs and rural Entrepreneurs.

UNIT II

Institutional finance to entrepreneurs –SFCs- SIDCs- SPCOT- commercial Banks- UTI- Small Industries Development Bank.

UNIT III

Special Agencies for entrepreneurs- DICs- SIDO-NSIC-SISIs-Indian Investment Centre- Khadhi and Village Industries Commission.

UNIT IV

Incentives and subsidies- Subsidy scheme for selected categories of Industries- subsidy for feasibility report /studies, Exemption from power cut, concessional power tariff, concession in water Royalties, interest free sales tax loan, stamp duty exception, special concession for SC and ST entrepreneurs

UNIT V

Industrial Sickness- causes and consequences of Industrial sickness, corrective measures- Government policies for small scale enterprises. Project identification - meaning and classification of project- project formulation – concept, significance and elements of project formulation – Evaluation and project report.

References:

1. Khanka S.S 1999 Entrepreneurial development New Delhi
2. Paramjeet Kaur 1994 Women entrepreneurs, New Delhi
3. Saravanavel .P 1987 Entrepreneurial Development, Chennai
4. Srinivasan. N.P. 1999 Entrepreneurial Development New Delhi

NON – MAJOR ELECTIVE
WOMEN AND DEVELOPMENT

UNIT I

Women and development – their roles in family – community and society – status of women – values with reference to Indian women.

UNIT II

Women and family – Family structures – Women's roles in decision making in the family.

UNIT III

Problems of women – child marriage, dowry, female infanticide, and foeticide educational backwardness, deserted and divorced women , prostitution – trafficking – rape – women and media- Empowerment of women.

UNIT IV

Working women – women employment – working women and their problems – women in Industry – women in agriculture – women and self-employment.

UNIT V

Women and Health – health services – Food and Nutrition - Education – Family welfare - Women and laws.

1. Medical Termination of pregnancy Act, 1971.

2. Equal remuneration Act, 1976.

Central and State Government Welfare programmes for women.

References:

1. Mazumdar, V (ed) : women in changing society symbols of power , Bombay: Allied publishers

2. Desai , N and Krishnaraj, M 1987 : women and society in India. Delhi : Ajanta publishers

3. Augutine , (Ed) : Indian family in transition New Delhi : Vickas publishing house.

4. Bhasin , K and Agarwai, B 1984 : Women and Media Analysis Alternatives an Action , New Delhi , Kali for women

5. Benerjee, Nirmala : Indian women in a changing industrial scenario.

6. Gopalan C & Balasubramaniam SC Indian council of medical Hyderabad : research ,1963

SKILL BASED SUBJECT – 3

PROJECT MANAGEMENT

Unit – I

Project Management: concepts, tools and techniques; The Project manager: Manager's role and functions; Project preparation: Guidelines for drafting a Project.

Unit – II

Planning: nature, purpose, steps, types, merits and demerits; Organising: nature, purpose departmentation, span of control, delegation, centralization and decentralization.

Unit – III

Staffing: nature and purpose, components of staffing; Controlling: concepts and methods;

Coordinating: need, principles, approaches for effective coordination

Unit – IV

Monitoring: Formulation of objectives; Designing a monitoring system; Participatory monitoring process; Reporting ongoing and the completed project.

Unit – V

Evaluation of projects: types, procedures and processes; Participatory evaluation: Evaluation and reporting of an ongoing/completed project; Participatory Rapid Appraisal

(PRA); Management Information System (MIS).

Suggested Readings:

1. Nagarajan K. 2001. *Project Management*. New Delhi: New Age International.
2. Desai, Vasant. 1997. *Project Management*. Mumbai: Himalaya Publishing House
3. Singh, Narendra. 1998. *Project Management and Control*. Mumbai: Himalaya Publishing House.
4. Terry, G. *Principles of Management*.
5. Karmakar, K.G. *Rural Credit and Self Help Groups: Micro Finance*.
6. Narayanasamy, N. et al. 2001. *Suya Uthavi Kulukal Melanmai* (Tamil). Gandhigram: Gandhigram Rural Institute.

SEMESTER – VI
MEDICAL SOCIAL WORK

UNIT 1: Concepts of health, well-being, health care and development. Relationship between health, mental health and development; Social and environmental production of illness.

UNIT 2: Health and health care problems; Migration, marginalization and health; Violence, conflict, health and development.

UNIT 3: Clinical illnesses (and their manifestation, role of social worker in such illnesses; psychosocial aspects related to various illnesses.

UNIT 4: Social Work Interventions in a clinical and non-clinical setting; working with individuals, groups, families and communities; social action and advocacy.

UNIT 5: Welfare and benefits accrued to persons with an illness, health insurance, Social Work practice in different settings, Medical emergencies and role of social worker.

REFERENCES

1. Doyal, Lesley and I. Pennell. (1989). The Political Economy of Health, London: Pluto.
2. Monica Das Gupta *et al* (eds.). (1996). Health, Poverty and Development in India, Delhi: Oxford University Press.
3. Park, J.E. (2006). Textbook of Social and Preventive Medicine, 17th edition. Jabalpur: Banarsidas Bhanot.
4. World Health Report. (2001). World Health Organization, Geneva.

SOCIAL WORK IN INDUSTRIES

UNIT 1: Labour: concept, characteristics and problems of Indian labour- labour in organized and unorganized sectors.

Unit 2: **Labour Welfare:** concept, scope, theories and Principles of Labour welfare-and classification- Role and functions of Labour Welfare Officer. Objectives and functions of International Labour Organization (ILO) - role of ILO in labour welfare-implementation of ILO recommendations in India

UNIT 3: Labour Legislations: Concept, need and historical development of Labour Legislation in India Factories Act, 1948 – Occupational safety and health-The Contract Labour (Regulations and Abolition) Act, 1970, Concept and types of wages-Legislations relating to Wages: The Payment of Wages Act,1936- The Minimum Wages Act , 1948.

UNIT 4: Industrial Relations – Meaning, Scope and Need. Factors influencing IR - Actors of IR-Employees and their organization, employers and the government - Approaches to IR- Bipartite and Tripartite Machineries for IR –Trade Unions.

UNIT 5: Social Security

Meaning & scope of social security, social assistance & social insurance, legal provision for social security in India workmen compensation act 1923, employers provident fund act 1952, ESI act 1948, Maturity benefit act 1961.

REFERENCES:

1. Memoria C.B. : Industrial relations in India
2. 6.Ajay Bhola, J.N. Jain. (2009). *Modern industrial relations and labour laws*. Regal Publications.
3. Arun Monappa. (1989). *Industrial relations*. New Delhi: Tata Magraw-Hill
4. BD Singh. (2010). *Industrial relations and labour laws*. Excel Books Publications.
5. Bhatia S.K. (2008). *Industrial relations and labour laws*. New Delhi: Deep and Deep Publications.
6. Dewan and Sudharsan. (1996). *Labour management*. New Delhi: Discovery Publishing House
7. Gaur.L. (1986). *Trade Unionism and industrial relations*. New Delhi: Deep and Deep
8. Giri,V.V. (1959). *Labour problems in Indian industry*. Bombay: Asia publishing house.
9. Jain J.N. (2009). *Modern industrial relations and labour laws*. New Delhi: Regal Publications

SOCIAL WORK WITH PERSONS WITH DISABILITIES

Unit 1: Disability

Concepts, impairment, handicapped and rehabilitation. Types of disabilities- Visually handicapped, hearing handicapped, mentally handicapped, orthopedically handicapped including spastics children and leprosy cured. Psycho-Social problems of the disabled: Social work intervention with the disabled

Unit 2:

Causes of disabilities- malnutrition, vitamin deficiencies, genetic disorder, congenital deformities, accidents etc.

Unit 3:

Persons with Disability Act 1995- emphasis on the appointment of state commissioners for disabled in all States.

Unit 4:

Government scheme for disabled offered by state commissioner for disabled-(a) Special education (b) Training programme (c) Employment of persons with disability (d) Self Employment for disabled and (e) Supplying of aids and appliances: Grant- in aid to NGO'S Vocational training and welfare of persons with disabilities in Tamilnadu.

Unit 5:

Approaches in rehabilitation- community based approach and outreach programmes by NGO'S for disabled, Role of family in the treatment, training and rehabilitation of the handicapped.

Reference:

1. Spurgeon and Pearson- Emotional Problems of living.
2. Minna field, Patients and People, New York, Columbia University press.
3. Ida M. Cannon, On the Social Frontiers of Medicine, London, Harward University press.
4. Merfalia,J.C-Handicapped Child.
5. Merfalia,J.C-Rehabilitation in India, Publication.
6. Policy Note, Citizens Charter and Performance Budget of social welfare Dept, Govt. of Tamilnadu.
7. PWD Act 1995 Govt. of India Publication.
8. Schemes for Disabled by state commissioner.

CORRECTIONAL SOCIAL WORK

Unit 1: Criminal Justice System:

Legislative – police – judiciary and correctional system – origin and development of correctional social work in India.

Unit 2:

Penology and corrections – probation – parole – half way homes – open air prisons and welfare measures meant for prisons – prisoners' rights UN minimum standard rules for prisons.

Unit 3:

Social defense in India – juvenile delinquency – Institutional & Non – institutional programmes for delinquency – Juveniles guidance Bureau – Boys Club – Boot Camps and other programmes meant for delinquents.

Unit 4:

Victimology – concept – philosophy – Victimology in India.

Unit 5: Correctional Techniques:

Preventive and curative measures – Role of social worker in correctional Administration. Social theory – psycho analysis and other therapeutic methods of corrections.

References:

1. Sutherland and Chessy, Principles of Criminology, Bombay. The times of India Press, 1968.
2. Tappan Paul, W. Contemporary Corrections, New York: Hill Book Ltd., Inc.1951.
3. Tappan Paul, W. Crime, Justice & Correction, New York: Mc.Graw Hill Book Company.
4. Wadia, A.R., Historical and Philosophical Background of Social Work, Tata Institute of Social Publications, Bombay.
5. Chakrabarthy N.K., Juvenile Justice, Deep & Deep Publications, Pvt.Ltd., New Delhi, 1999.
6. Panakal J.J. & S.D.Gokhale, Crime and Corrections in India, rate Institute of Social Sciences, Bombay, 1989.
7. Parvesh K.Atri, Dimensions of Crime in India, Anmol Publications Pvt.Ltd., New Delhi, 1998.
8. Ansari, M.A.Social Justice and Crime in India, Sunlime Publications Jaipur, 1996.
9. Antony A.Vass, Social Work Competencies – Core Knowledge Values and Skills, Sage Publications, New Delhi, 1998.
10. Rajendra K.Sharma, Criminology and Penology, Atlantic Publicshers and Distributors, Delhi, 1998.

ELECTIVE – 3

HUMAN RIGHTS

Unit – I

Meaning of Human Rights – Kinds of human rights – Theories of human rights – The concept of human rights – The concept of liberty and equality - Promotion and protection of human rights by the United Nations. History and Development of Human rights concepts.

Unit – II

The universal declaration of human rights – preparation – preamble and enumeration of rights in the declaration – India and the universal declaration – Influence of the universal declaration.

Unit – III

Indian constitutional guarantee of human rights – preamble, Fundamental rights – Directive principles of state policy – Recent amendments of Indian constitution.

Unit – IV

Violation of human rights – women – children – workers – prisoners – Dalits.

Unit – V

Human rights and voluntary organization at International, National and State level – Human rights commissions in India – National Human rights commission – Its constitution – power and Functions – Human rights court in districts.

References:

1. Agarwal, H.O. Human rights. Allahabad Central Law Agency
2. Bagyamuthu. D.Human Rights and people's structure. Chennai; Christian Literature Society
3. Gadgil D.R.1968 Human Rights in a Multi – Nation. Bombay; Asia Publishing
4. Gokulesh sharma Human Rights and Legal Remedies New Delhi: Deep and Publishin
5. Sivagami Paramasivan Human Rights – A study in Salem Sri Ram Computer Printers
6. Sudhir Kapoor Human Rights in 21st century Jaipur; Mangal Deep Publicatons
7. Lalit parmar
8. Human Rights – Aamo / Publications Pvt. Ltd – New Delhi – 110 002.(India) 1998
9. 8J.Ravindran Human Rights Praxis A resource boole for study, action and reflection. The Asian Forum for Human rights and Development(Forum – ASIA) Bangkok 10320, Thailand, Printed at Multivista Global Ltd Chennai – India.

SKILL BASED SUBJECT – 4

FUNDAMENTALS OF ACCOUNTING

Unit – I

Book keeping: Definition, objectives, systems; Book of Accounts: Day book, Ledger accounts; Recording of Transactions: kinds of accounts; Rules for debit and credit.

Unit – II

Trial Balance: meaning, objectives, scope, preparation, error and rectification; Proforma Invoice; Stock Register.

Unit – III

Final Accounts and Balance Sheet: Definition, objectives and preparation of trading accounts; Profit and Loss Account and Balance Sheet.

Unit – IV

Accounting for Non-Profit Organisation: Receipts and Payments Account, Income and Expenditure Account; Balance Sheet; Maintenance of Project Account.

Unit - V

Accounting Information System: meaning and importance, end users; Financial Statements: limitations, rearrangement and modification, Accounting vs. Reporting formats; Preparation of Reports: Statement of Accounts, Statement of Inventory, Cash Flow Summaries.

Suggested Readings

1. Krishnaswamy, O.R. 1980. Cooperative Account Keeping. New Delhi: Oxford and IBH Publishing Co.
2. Maheswari, S.N. 1993. Financial Accounting New Delhi: Vikas Publishing House.
3. Grewaal, T.S. Introduction to Accountancy. New Delhi: S. Chand & Sons.
4. Gupta, R.L. Advance Accounting. Vol. I. New Delhi: S. Chand & Sons.

THIRUVALLUVAR UNIVERSITY

PART-IV

ENVIRONMENTAL STUDIES

SYLLABUS

(For all UG Degree Courses)

(with effect from 2017-2018)

SEMESTER I

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES :

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem.

Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution - pollution case studies.

UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION

Urban issues - Energy - water conservation - Environmental Ethics - Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental protection Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UNIT-V: FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem - Report submission

REFERENCES

1. KUMARASAMY, K., A.ALAGAPPA MOSES AND M.VASANTHY, 2004.
ENVIRONMENTAL STUDIES, BHARATHIDASAN UNIVERSITY PUB, 1, TRICHY
2. RAJAMANNAR, 2004, ENVIRONMENTAL STUDIES, EVR COLLEGE PUB, TRICHY
3. KALAVATHY, S. (ED.) 2004, ENVIRONMENTAL STUDIES, BISHOP HEBER COLLEGE
PUB., TRICHY

THIRUVALLUVAR UNIVERSITY
PART-I
FRENCH
SYLLABUS
(COMMON FOR ALL UG DEGREE COURSES)
UNDER CBCS
(with effect from 2017-2018)
SEMESTER I
PAPER I

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METHODE DE FRANCAIS (PAGE 11 TO 67)

AUTHOR: Dr.K.Madanagobalane et all

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2) Leçon 2: A L'UNIVERSITE (P.17)

3) Leçon 3: AU CAFÉ (P.24)

4) Leçon 4: A LA PLAGE (P.32)

5) Leçon 5: UN CONCERT(P.41)

6) Leçon 6: CHEZ NALLI(P.49)

7) Leçon 7 : NOUVELLES DE L'INDE (P.58)

SEMESTER II

PAPER II

PRESCRIBED TEXTBOOK: SYNCHRONIE I

METHODE DE FRANCAIS (PAGE 68 TO 104)

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2) Leçon 9: UN LIT DANS LA CUISINE(P.75)

3) Leçon 10:PIERRE APPREND A CONDUIRE(P.75)

4) Leçon 11: MANGEZ-VOUS CORRECTEMENT (P.88)

5) Leçon 12: ILS ONT EU TORT TOUS LES DEUX(P.98)

SEMESTER III

PAPER III

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- 2) Leçon 2: Au restaurant (P.17)**
- 3) Leçon 3: Enfin les vacances ! (P.26)**
- 4) Leçon 4: Un autre Institut (P.34)**
- 5) Leçon 5: Un Indien célèbre visite la France (P.41)**
- 6) Leçon 6: Qui dépense plus? (P.48)**
- 7) Leçon 7 : Penser à son avenir (P.54)**

SEMESTER IV

PAPER IV

PRESCRIBED TEXTBOOK: SYNCHRONIE IV

METHODE DE FRANÇAIS : Leçons 8 à 13 (PAGE 60 TO 100)

AUTHOR: Dr.K.Madanagobalane et all

SAMHITA PUBLICATIOONS

51, Officers'lane

Pallavaram Cantonment, Chennai-600043

Samhita_ publications@yahoo.com

aitf_india@yahoo.co.in

- 1)Leçon 8: L'Astrologie (P.60)**
- 2) Leçon 9: Prières du Nouvel an(P.67)**
- 3) Leçon 10:Retrouvailles(P.72)**
- 4) Leçon 11:C'est lui le meilleur (P.77)**
- 5) Leçon 12: Sauvons notre Terre !(P.82)**
- 6) Leçon 13 : Le jour des élections s'approche(P.87)**

Thiruvalluvar University, Vellore

French - Semester I & II

Common Pattern of Question Paper

The question Paper will carry 75 Marks and will consist of 3 Sections:

Section A (10x2=20 marks)

10 questions on different seen aspects of grammar

Section B(5x5=25 marks)

5 questions to be answered EITHER OR CHOICE

Answer in French to the questions from lessons

-Find the question

-Write the numbers

-Write the hours

-write a small dialogue

-Relate your activities

-Talk about some famous Supermarkets

Section C(3x10=30 marks)

Three out of Five questions

-Answer to the general questions

-Questions on cultural elements

-Description of a house

-Send an email to your friend in French

-Write a few lines in French about a monument

Thiruvalluvar University, Vellore

French Semester III and IV

Common Pattern of Question Paper

The question Paper will carry 75 Marks and will consist of 3 Sections:

Section A (10x2=20 marks)

10 questions on different seen aspects of grammar

Section B(5x5=25 marks)

5 questions to be answered with either or choice

- Answer in French to the questions from lessons
- Answer to question of comprehension
- Direct/indirect speech
- Send a New year Card with your wishes to a parent
- write a dialogue: advantages of living in a town
- Find out the mistakes in the given passage and correct them

Section C(3x10=30 marks)

Three out of Five questions

- Answer to the general questions
- Questions on cultural elements
- System of Education in France
- Prepare a menu card of an Indian restaurant
- Discuss with your friend about your preferred Channel

THIRUVALLUVAR UNIVERSITY

PART-I

HINDI

SYLLABUS

(COMMON FOR ALL UG DEGREE COURSES)

UNDER CBCS

(with effect from 2017-2018)

SEMESTER I

PAPER I

SYLLABUS AND BOOKS PRESCRIBED:

I.PROSE: GADYA MUKUR - Ed.Dr. Shaik Abdul Wahab

Raka Prakashan.40 A, Motilal Nehru Road, ALLAHABAD -2

Lessons Prescribed:

1. AATMA NIRBHARTHA by Pt.Balkrishna Bhatt
2. MITRATA by Ramchandra Shukla
3. MADHUR BHASHAN by Gulab Roy
4. HEENGVALA-by Subhadrakumari Chouhan
5. AJATSHATRU by Jayshankar Prasad

II. APPLIED GRAMMAR

Prescribed Points:

1. Gender
2. Number
3. Causive Verbs
4. Voice
5. Correction of Sentences

III. LETTER WRITING:

Prescribed Letters:

1. Ordering for books
2. Letter for Employment
3. Letter of Complaint
4. Opening an Account in Banks
5. Leave Letter

IV.FUNCTIONAL HINDI:

Administrative & Business terminology:

English to Hindi and Hindi to English
(Prescribed Terminology Enclosed)

Books for Reference:

- 1.Hindi Vyakaran by Shastri & Apte, D.B.H. Prachar Sabha,Chennai.
2. Karyalaya Alekhan aur Tippan, publisher, Karnataka Mahila Hindi Sewa Samithi Banagalore- 18.
3. Vyavasayik Hindi, Prof. Rahamathullah, Vani Prakashan,New Delhi- 2

***Books Available at:**

1. Raka Book Shop ,25 A Mahatma Gandhi Marg, Civil Lines ALLAHABAD -211002
2. Hindi Books at (M) 9443816403.

PRESCRIBED SYLLABUS FOR Q.No.21:

ADMINISTRATIVE AND BUSINESS TERMINOLOGY

ENGLISH TO HINDI:

ASSISTANT, ACCOUNTANT, AUDITOR, AMBASSADOR, ADMINISTRATION, ALLOWANCE, ADVISOR, BANK MANAGER , BEARER, CABINET, CIRCULAR, CLERK, CONTROLLER, CONTRACTOR, COMMISSIONER, CHIEF JUSTICE, CASHIER, CUSTOMER, CHANCELLOR, CORRESPONDENT, CASH, DIRECTOR, DOCUMENT, EDITOR, ENGINEER, ELECTION COMMISSION, EMPLOYMENT, FUND, GENERAL MANAGER, GOVERNOR, GRANT, GAZETTED OFFICER, HEADQUARTERS, INCOME TAX, INSPECTOR, LOAN, MINISTER, PRIME MINISTER, MINISTRY OF DEFENCE, MINISTRY OF FINANCE, MINISTRY OF HRD, MINISTRY OF HOME AFFAIRS, MINISTRY OF HEALTH, MINISTRY OF LAW, MINISTRY OF RAILWAYS, MINISTRY OF TOURISM, MINISTRY OF EXTERNAL AFFAIRS. MINISTRY OF COMMERCE, ORDER, PROGRAMME, PARLIAMENT, QUALIFICATION, REGISTRAR, REVENUE, REPAYMENT, SECRETARY, DEPUTY SECRETARY, ADDITIONAL SECRETARY, JOINT SECRETARY, GENERAL SECRETARY, TYPIST, TRANSFER, TRANSPORT, VICE CHANCELLOR, WORK SHOP.

HINDI TO ENGLISH PHRASES:

Payau->, pavatl BaojaoM, inadoSaanausaar, , jaOsal isqait hao, kl Aaor Qyaana AakiYat ikyaa jaata hO,, inavaodna hO ik, ko AadoSa sao, ko pxa maom, pd ko naato, ivalamba ko ilae Kod hO , ivamaSa- klijae , Anaumaaodna ko ilae, maaga-dSana ko ilae, hstaxar ko ilae, ivaYaya ivacaaraQalna , ivacaar ikyaa jaae , maJao inadoSa huAa hO , AkRt evaM SaUnya, AsvalkRt klijae, Bavadlya, Aapka, laimbat ikyaa jaae, [sa AvaiQa maom , doK ilayaa fa[la klijae , yaqaaSaIGa.

HINDI FIRST SEMESTER
QUESTION PAPER PATTERN

SECTION A (20marks)

I. Answer all the questions

10 X 2 = 20

Short answer type questions from **PROSE**

(Q.No.1 to Q.NO. 5)

(Q.No.6 to Q.NO. 10) from **Applied Grammar**

Q.6 Number –four words.

Q.7 Gender - four words.

Q.8 Causal Verbs- four words.

Q.9 Voice change- two sentences

Q.10 Correction of sentences- two sentences

SECTION B (25marks)

II. Annotate the following **5** from **PROSE**

5 X 5 = 25

Q.No.11 a) or b) 12a) or b).....15a) or b).

SECTION C (30marks)

III. Answer any **3** out of **5** only Q.No.20 is compulsory to answer.3X10=30

Q.No. 16 from **Prose**.

Q.No. 17 from **Prose**

Q.No.18 from **Prose - Character**

Q.No.19 from Letter writing

Q.No.20 from **Technical Terminology**

(Prescribed Terminology only)

(a) Adm.Bus .Terms English to Hindi

5 out of 8 . 5X1=5

(b) Adm.Bus. Phrases Hindi to English

4 out of 6. 4X1. 1/4=5

SEMESTER II

PAPER- II

SYLLABUS AND BOOKS PRESCRIBED:

I ONE ACT PLAY : '**GADYA MUKUR**' Ed. Dr.Shaik Abdul Wahab

Raka Prakashan,Allahabad

LESSONS PRESCRIBED : 1. DEEPDAN by RAMKUMAR VARMA

2. BEEMAR KA ILAAJ by UDAY

SHANKAR BHATT

3. GAON KA ESHWAR by

LAXMINARAYAN LAL

II SHORT STORY : TEXT – '**GADYA MUKUR**'

LESSONS PRESCRIBED : 1.NAMAK KA DAAROGA by

PREMCHAND

2. USNE KAHA THA by GULERI

3. MAHUYE KA PED by MARKANDEY

III TRANSLATION PRACTICE : ENGLISH TO HINDI

ANUVAD ABHYAS – III

D.B.HINDI PRACHAR SABHA

CHENNAI-17

LESSONS PRESCRIBED : PASSAGES in ENGLISH

IV DIALOGUE WRITING : GENERAL SITUATIONS like

CONVERSATION BETWEEN

1.TEACHER AND STUDENT

2. TWO FRIENDS,

3. BOOK SELLER AND STUDENT, 4.TWO PASSENGERS, 5. SHOP KEEPER
AND CUSTOMER 6. DOCTOR AND PATIENT.

*Books Available at: 1. Raka Book Shop ,25 A Mahatma Gandhi Marg,

Civil Lines, ALLAHABAD -2

2. Hindi Books at (M) 9443816403.

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THIRUVALLUVAR UNIVERSITY, VELLORE

SECOND SEMESTER – HINDI PAPER – II

QUESTION PAPER PATTERN

SECTION A (10X2= 20MARKS)

ANSWER ALL QUESTIONS – NOCHOICE

5 Qs.from ONE ACT PLAY

5 Qs. From SHORT STORY

SECTION B (5 X 5 = 25 MARKS)

ANNOTATIONS 4 from **ONE ACT PLAY** only

Q.No.11 to Q.No.14 Either or type 11a) or b) 12a) or b).....

Q.No. 15 a) or b) .. DIALOGUE WRITING.

SECTION C (3 X 10 = 30 MARKS)

ANSWER ANY 3 OUT OF 5 only Q.No.20 is compulsory to Answer.

16 ONE ACT PLAY 17 ONE ACT PLAY - Character

18 SHORT STORY 19 SHORT STORY - Character

20 TRANSLATION of a Passage from ENGLISH to HINDI

SEMESTER III

PAPER III

SYLLABUS AND BOOKS PRESCRIBED:

I POETRY – OLD AND MEDIEVAL POETRY

TEXT : ‘RAKA HINDI KAVYA SANGRAH’,

Ed.Dr.Shaik Abdul Wahab

RAKA PRAKASHAN,40 –A, MOTILAL NEHRU ROAD

ALLAHABAD -2

POEMS PRESCRIBED :PART – I:1. KABIR – DOHE

2. TULSIDAS – DOHE

3. SURDAS – PAD

4. MEERABAI – PAD

5. RAHIM – DOHE

6. BIHARI – DOHE

II DRAMA – ‘YUGE YUGE KRANTHI’by VISHNU PRABHAKAR

PUBLISHERS

RAJPAL & SONS

KASHMERE GATE

DELHI – 6

III APPLIED GRAMMAR – 1.SYNONYMS(paryayvachi shabd)

2.ANTONYMS(vilom shabda)

3.ONE WORD SUBSTITUTE (anek ke liye ek shabd)

4.TENSE(kaal)

5.SPELL CHECK(shuddha roop)

IV IDIOMS AND PROVERBS MEANING only (PRESCRIBED
IDIOMS AND PROVERBS ENCLOSED)

BOOKS FOR REFERENCE:

1. HINDI VYAKARAN by SHASTRI AND APTE, D.B.HINDI

PRACHAR SABHA,CHENNAI -17

2. VYAVAHARIK HINDI VYAKARAN by Dr.HARDEV BAHRI.

LOKBHARATHI PRAKASHAN, ALLAHABAD.

3. HINDI SHABDA SAMARTHYA by PRABHATH PRAKASHAN

NEW DELHI.

4.RAJPAL HINDI SHABDAKOSH, DR.Hardev Bahri,Rajpal&sons,DELHI
– 6.

*Books Available at: 1. Raka Book Shop ,25 A Mahatma Gandhi Marg, Civil Lines, ALLAHABAD -2

2. Hindi Books at (M) 9443816403.

From 2012 – 2013 onwards:-

**THIRD SEMESTER – HINDI PAPER – III
PRESCRIBED IDIOMS AND PROVERBS FOR SECTION – B :**

- 1 ईद का चोंद होना दर्शन दुर्लभ होना/ बहुत कम दिखाई देना ।
- 2 कोलू का बेल बहुत अधिक परिश्रम करनेवाला ।
- 3 उल्टी गंगा बहाना अनहोनी बात करना / प्रतिकूल बात करना ।
- 4 छाती पर मूंग दलना सामने रहकर दुःख देने रहना ।
- 5 तीन तेरह करना तितर बितर करना ।
- 6 टेढ़ी खीर मुश्किल काम ।
- 7 उल्टा चोर कोतवाल को डोंटे दोष अपना और दूसरों को धमकाना ।
- 8 अंगूठा दिखाना मना कर देना / तिरस्कार करना
- 9 गोबर गणेश होना मूर्ख और आलसी होना ।
- 10 हाथ मलना पछताना ।
- 11 दौंत खड़े करना बुरी तरह हरा देना ।
- 12 रंगा सिंघार होना कपटी होना ऊपर से कुछ अंदर से कुछ होना ।
- 13 गागर में सागर भरना थोड़े में बहुत कुछ कहना ।
- 14 खरी खोटी सुनाना धला बुरा कहना ।
- 15 कान का कच्चा बात सुनकर तुरंत सच मान लेनेवाला ।
- 16 एक पंथ दो काज एक समय में दो कार्यों की सिद्धि ।
- 17 जिसकी लाठी उसकी धैर्य ताकतवर की जीत होती है ।
- 18 नाच न जाने आंगन टेढ़ा काम करना नहीं आता पर और चीजों में दोष निकालना ।
- 19 ऊँट के मुँह में जीरा अधिक जखरतवाले को थोड़ा देना ।
- 20 एक अनार सौ बीमार एक चीज और चाहनेवाले बहुत ।
- 21 घोड़ी का कुत्ता न घर का न घाट का कहीं का न रहना ।
- 22 मन चंगा तो कटौती में गंगा मन शुद्ध हो तो घर पर ही तीर्थाटन का फल ।
- 23 जैसा देश वैसा भेष जहाँ रहें वहीं की रीतियों का आचरण करना ।
- 24 दूर के ढोल गुहावने दूर के लोग या चीजें अच्छी मालूम पड़ना ।
- 25 खोदा पहाड़ निकली चुहिया परिश्रम अधिक पर लाभ कम ।
- 26 किर्कृत्यविमूढ़ होना अयमंजस में पड़ना
- 27 आकाश पानाल एक करना बहुत परिश्रम करना
- 28 टका या जवाब देना साफ़ इनकार कर देना
- 29 रंगा सिंघार कपटी, धोखेबाज
- 30 बाएँ हाथ का खेल बहुत आसान काम

III SEM - HINDI
QUESTION PAPER PATTERN

SECTION A(20 marks)

10 SHORT ANSWER TYPE QUESTIONS 10 X 2 = 20 MARKS

5 QUESTIONS FROM POETRY

5 QUESTIONS FROM DRAMA

SECTION B (5X5 = 25 marks)

ANNOTATE THE FOLLOWING FROM POETRY. 5 X 5 = 20 MARKS

Q. NO. 11a) or b) 12a) or b) 13a) or b) 14a) or b)

Q.15a)WRITE MEANINGS OF IDIOMS & PROVERBS(5)

Or

b) WRITE MEANINGS OF IDIOMS & PROVERBS(5)

SECTION C (3X10 = 30 marks)

Answer any THREE out of FIVE.**Q.No.20 is compulsory to answer.**

Q.No.16 ESSAY Q. FROM POETRY

Q.No.17 ESSAY Q. FROM POETRY

Q.No.18 ESSAY Q. FROM DRAMA

ESSAY Q. CHARACTER FROM DRAMA

Q.No.19

Q.No.20 APPLIED GRAMMAR – 1. ONE WORD SUBSTITUTION 2

2. SYNONYM – 4WORDS

3. ANTONYMS-4 WORDS

4.CHANGE TENSE-2 SENTENCES

5. SPELL CHECK-4 WORDS

SEMESTER IV

PAPER – IV

(EFFECTIVE FROM 2012-2013 ONWARDS)

SYLLABUS AND BOOKS PRESCRIBED:

I POETRY –MODERN POETRY

TEXT : ‘RAKA HINDI KAVYA SANGRAH’,

Ed. By Dr.Shaik Abdul Wahab

RAKA PRAKASHAN,40 A MOTILAL NEHRU ROAD

ALLAHABAD -1

POEMS PRESCRIBED :– PART -II

1. MYTHILISHARAN GUPTA –YASHODHARA KA ANUTHAP
 2. JAYSHANKAR PRASAD – SHRADDHA KA UDBODHAN
 3. MAHADEVI VARMA – VE MUSKATE PHOOL NAHI
 4. SUMITRANANDAN PANT – SUKH –DUKH
 5. SUBHADRA KUMARI CHOWHAN – MERA JEEVAN
 6. NIRALA – ABHI NA HOGA MERA ANTH
 7. DHARMAVEER BHARATHI – TOOTA PAHIYA
- II NOVEL – ‘SAMUDRA MEIN KHOYA HUA ADMI’ by

KAMALESHWAR[FOR NON – DETAILED STUDY]

LOKBHARTHI PRAKASHAN

ALLAHABAD.

III TRANSLATION – HINDI TO ENGLISH ONLY

BOOK PRESCRIBED: ANUVAD ABHYAS – III

D.B.H.P.SABHA, CHENNAI – 17

IV FUNCTIONAL HINDI - OFFICIAL CORRESPONDENCE

[DEFINITIONS AND CONTEXT OF USAGE ONLY]

1. CIRCULAR

2. OFFICE ORDER

3 .REMINDER

4. DEMI OFFICIAL LETTER

5.NOTIFICATION only

BOOKS FOR REF:1 KARYALAY ALEKHAN AUR TIPPAN, KARNATAK

MAHILA HINDI SEWA SAMITI, BENGALURU.

2. PRAYOJANMULAK BHASHA AUR KARYALAYEEN

HINDI by Dr.Goswami, Kalinga Prakashan, DELHI – 91

*Books Available at: 1. Raka Book Shop ,25 A Mahatma Gandhi Marg, Civil Lines, ALLAHABAD -2

2. Contact for Hindi Books at (M) 9443816403.

IV SEMESTER - HINDI
QUESTION PAPER PATTERN

SECTION A(20 marks)

10 SHORT ANSWER TYPE QUESTIONS 10 X 2 = 20 MARKS

4 QUESTIONS FROM POETRY

4 QUESTIONS FROM NOVEL

2 DEFINITIONS OF OFFICIAL LETTERS

SECTION B(5 X 5 = 25 marks)

ANNOTATE THE FOLLOWING FROM POETRY. 5 X 5 = 25 MARKS

Q. NO. 11a) or b) 12a) or b) 13a) or b) 14a) or b) 15a) or b)

SECTION C (3 X 10 = 30 marks)

Answer any THREE out of FIVE. **Q.No.20 is compulsory to answer.**

Q.No.16 ESSAY Q. FROM POETRY

Q.No.17 ESSAY Q. FROM POETRY

Q.No.18 ESSAY Q. FROM NOVEL

Q.No.19 ESSAY Q. CHARACTER FROM NOVEL

Q.No.20 TRANSLATION HINDI to ENGLISH

THIRUVALLUVAR UNIVERSITY

PART-IV

SOFT SKILL

SYLLABUS

(For all UG Degree Courses)

(with effect from 2017-2018)

UNIT I

- 1.1. Skills in Listening and Writing
- 1.2. Skills in Reading and Understanding

UNIT II

- 2.1. Skills to Read and Respond to Instructions
- 2.2. Skills of Interpretation and Transcoding Information

UNIT III

- 3.1. Skills in Seeking and Responding to Information
- 3.2. Skills of Day-to-Day communication

UNIT IV

- 4.1. Grammatical skills and Spelling rules
- 4.2. Career skills

UNIT V

- 5.1. Skills of formal and in-formal expressions
- 5.2. Skills of non-verbal communication

Note: The contents of the previous book for 'Soft Skills' by Trinity Publication for I year UG students have not been changed. However, the titles of the contents have been modified.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு : பகுதி - 1 தமிழ்
முதலாமாண்டு - முதற்பருவம்

அலகு - 1 கவிதை

1. பாரதியார் - 1. உறுதிவேண்டும், 2. புதுமைப்பெண்
2. பாரதிதாசன் - புரட்சிக்கவி “பேரன்பு கொண்டவரே” என்ற பாடல் முதல் “கவிஞனுக்கும் காதலிக்கும்” என்ற பாடல் வரை.
3. கவிமணி - ஆசியஜோதி - புத்தரும் ஏழைச் சிறுவனும்
4. கண்ணதாசன் - நீ மணி, நான் ஒலி!
5. கவிஞர் அறிவுமதி - நட்புக் காலம்
6. வைரமுத்து - தமிழுக்கு நிறுமூண்டு - கூடு
7. மு. மேத்தா - வாழை மரத்தின் சபதம்
8. செ. அன்னகாமு - நாட்டுப்புறப் பாடல்கள் - தாலாட்டு, ஒப்பாரி
9. அப்துல் ரகுமான் - கனவு நாயகன் - அப்துல் கலாம்

அலகு - 2 உரைநடை

1. உள்ளுணர்வு கனவாக வெளிப்படுகிறது - எம்.எஸ். உதயமூர்த்தி
2. வீழ்ந்த ஆலமரம் - கல்கி
3. ஏழாவது அறிவு (போரின்றி வெற்றி மட்டும்) - வெ. இறையன்பு

அலகு - 3 நாடகம்

1. மாங்கல்யப் பிச்சை - டி.என். சுகி. சுப்பிரமணியம்
2. சாபம் விமோசனம் - மு. இராமசாமி

அலகு - 4 சிறுகதை

1. வளையாத பனைகள் - இரா. நந்தகோபால்
2. ஒரு சிறு இசை - வண்ணதாசன்

அலகு - 5 மொழித்திறன்

1. அகர வரிசைப்படுத்தல்
2. ண-ன-ந, ல-ள-ழ, ர-ற வேறுபாடு அறிதல்
3. தன் விவரக் குறிப்பு தயாரித்தல்
4. கலைச் சொல்லாக்கம்
5. ஒற்றுப்பிழை, தொடர்ப்பிழை நீக்கி எழுதுதல்

இலக்கிய வரலாறு

பாடப்பகுதியை ஒட்டிய இலக்கிய வரலாறு : 20-ஆம் நூற்றாண்டுக் கவிஞர்களும் கவிதைகளும், உரைநடை, நாடகம், சிறுகதை.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு : பகுதி - 1 தமிழ்
முதலாமாண்டு - இரண்டாம் பருவம்

அலகு - 1

- அ. திருஞானசம்பந்தர் - தேவாரம் - திருவீழிமிழலை - வாசிதீரவே
(முழுவதும்)
- ஆ. மாணிக்கவாசகர் - திருவாசகம் - பிடித்த பத்து (அம்மையே, அருளுடை,
ஒப்புனக்கு, பாசவேர், பால்நினைந்து)
- இ. திருமூலர் - திருமந்திரம் - (உடம்பினை முன்னம், யாவர்க்குமாம்,
ஒன்றே குலமும், உள்ளம் பெருங்கோயில், ஆர்க்கும்)

அலகு - 2

- அ. ஆண்டாள் - திருப்பாவை (முதல் 5 பாடல்கள்)
- ஆ. தொண்டரடிப்
பொடியாழ்வார் - திருப்பள்ளியெழுச்சி (முதல் 5 பாடல்கள்)
- இ. குலசேகராழ்வார் - பெருமாள் திருமொழி, 4-ஆம் திருமொழி,
ஊனேறு செல்வம் ... (முதல் 5 பாடல்கள்)

அலகு - 3

- அ. தமிழ்விடுதாது - கண்ணி 69 முதல் 90 வரை
- ஆ. திருக்கயிலாய ஞான உலா - 1 முதல் 10 கண்ணிகள் வரை
- இ. தஞ்சைவாணன் கோவை - 1 முதல் 5 பாடல்கள்

அலகு - 4

- அ. இராமலிங்க அடிகள் - திருவருட்பா - பிள்ளைச் சிறுவின்ணப்பம்
- ஆ. எச்.ஏ. கிருஷ்ணப்பிள்ளை - இரட்சண்ய யாத்திரிகம் - குமாரப்பருவம் -
இரட்சணிய சரிதப் படலம்
- இ. குணங்குடி மஸ்தான்சாகிபு - மஸ்தான் சாகிபு பாடல்கள் - பராபரக் கண்ணி
(1-40 கண்ணிகள்)
- ஈ. முத்தொள்ளாயிரம் - 9 பாடல்கள்

அலகு - 5

- அ. நேர்காணல்
- ஆ. பொதுக்கட்டுரைகள்

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு : பகுதி - 1 தமிழ்

இரண்டாமாண்டு - மூன்றாம் பருவம்

அலகு I

திருக்குறள்

1. மக்கட்பேறு
2. விருந்தோம்பல்
3. இறைமாட்சி
4. காலமறிதல்
5. நெஞ்சோடு புலத்தல்

அலகு II

சிலப்பதிகாரம்

மதுரைக்காண்டம் - ஏழாவது காதை
ஆய்ச்சியர் குரவை

மணிமேகலை - பத்தொன்பதாவது காதை
சிறைக்கோட்டம் அறக்கோட்டம் ஆக்கிய காதை.

அலகு III

சீவகசிந்தாமணி

காந்தருவத்தையார் இலம்பகம்

கம்பராமாயணம்

கிட்கிந்தா காண்டம் - வாலிவதைப் படலம்

அலகு IV

பெரியபுராணம் - முதற்காண்டம்

தடுத்தாட்கொண்ட புராணம்

சீறாப்புராணம் - இரண்டாம் காண்டம் -
நுபுவத்துக் காண்டம் - சதைக்கட்டியைப்
பெண்ணுருவமைத்த படலம்

தேம்பாவணி - முதற்காண்டம் - வளன் சனித்த படலம்

அலகு V

மொழித்திறன்

1. கடிதம் வரைதல்
2. விண்ணப்பம் எழுதுதல்
3. தன் விவரம் எழுதுதல்
4. நிகழ்ச்சி நிரல் (அறிக்கை தயாரித்தல்)

இலக்கிய வரலாறு

பதினெண்கீழ்க்கணக்கு நூல்கள், அற இலக்கியங்கள்,
காப்பிய இலக்கியங்கள்.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு : பகுதி - 1 தமிழ்

இரண்டாமாண்டு - நான்காம் பருவம்

- அலகு I**
1. குறுந்தொகை (பாடல்கள் - 7, 8, 58, 94, 103)
 2. நற்றிணை (பாடல்கள் - 1, 226, 238, 249, 380)
 3. ஐங்குறுநூறு (குரக்குப்பத்து 1-5, சிறுவெண்காக்கைப்பத்து 1-5)
- அலகு II**
4. புறநானூறு (பாடல்கள் - 10, 18, 206, 212, 278)
 5. பதிற்றுப்பத்து (பாடல்கள் - 20, 59)
- அலகு III**
6. கலித்தொகை (பாடல்கள் - 8, 59, 84, 108, 120)
 7. பரிபாடல்
திருமால் - 1:36-73
செவ்வேள் - 5:55-81
வையை - 6:1-24
- அலகு IV**
8. பத்துப்பாட்டு - முல்லைப்பாட்டு (முழுவதும்)
- அலகு V**
9. சங்க இலக்கிய வரலாறு
(1) எட்டுத்தொகை நூல்கள்
(2) பத்துப்பாட்டு நூல்கள்
 10. மொழிபெயர்ப்பு
(1) கொடுக்கப்பட்டுள்ள ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல்.
(2) அலுவலகக் கடிதம் - தமிழில் மொழி பெயர்த்தல்

THIRUVALLUVAR UNIVERSITY

PART-IV

VALUE EDUCATION

SYLLABUS

(For all UG Degree Courses)

(with effect from 2017-2018)

SEMESTER II

UNIT-I

Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self esteem.

UNIT-II

Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-III

Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT-IV

Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

UNIT-V

Effect of international affairs on values of life/ Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

Reference Books

1. T. Anchukandam and J. Kuttainimathathil (Ed) Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M.Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

WEBSITES AND e-LEARNING SOURCES:

www.rkmissiondhe/.org/education.html/

www.clallam;;org/lifestyle/education.html/

www.sun.com/./edu/progrmws/star.html/

www.infoscouts.com

www.secretofsuccess.com

www.1millionpapers.com

<http://militaryfinance.umuc.edu/education/edu-network.html/>

திருவள்ளுவர் பல்கலைக்கழகம்
சிறப்புத் தமிழ் - பாடத்திட்டம்
தமிழ்

(+2 வரை தமிழ் பயின்று பட்டவகுப்பு பகுதி 1 இல் தமிழ் பயிலாத மாணவர்க்கு)

(CBCS Pattern)
With effect from 2017 - 2018

மூன்றாம் பருவம்

தாள் 1

இக்கால இலக்கியங்கள்

அலகு 1 : கவிதைகள்

- | | |
|--------------------------|---------------------------------------|
| 1) பாரதியார் கவிதைகள் - | 1) நிமிர்ந்த நன்னடை . . . |
| 2) பாரதிதாசன் கவிதைகள் - | 2) காக்கைச் சிறகினிலே . . . |
| 3) சுரதா - | 1) தன்பெண்டு தன்பிள்ளை. . . |
| | 2) இருட்டறையில் உள்ளதடா. . . |
| 4) மீரா - | தேன்மழை |
| | 1) காடு |
| | 2) எப்போதும் இருப்பவர்கள் - பாரதியார் |
| | குக்கூ |
| | 1) 1 முதல் 10 கவிதைகள் |

அலகு 2 : உரைநடை

- | | |
|--------------------------|-------------------------------------|
| 1) புதுமைப்பித்தன் - | 'ஒருநாள் கழிந்தது' சிறுகதை |
| 2) மு. வரதராசன் - | நல்வாழ்வு - வழிபாடு |
| 3) கி.ஆ.பெ. விசுவநாதன் - | 'கவிதைச் சிறப்பு' - தமிழின் சிறப்பு |

அலகு 3 : சிற்றிலக்கியங்கள்

- | | |
|-------------------------------|---------------------------------|
| 1) திரிகூடராசப்பக் கவிராயர் - | குற்றாலக் குறவஞ்சி - மலைவளம் |
| | 1. முழங்குதிரைப் புனலருவி . . . |
| | 2. கொல்லிமலை எனக்கிளைய . . . |
| | எனத் தொடங்கும் பாடல்கள் |
| 2) முக்கூடற்பள்ளு | 1. காயக்கண்டது . . . |
| | 2. பூதக்கோன் . . . |
| | எனத் தொடங்கும் பாடல்கள் |
| 3) நந்திக் கலம்பகம் | 1. ஆட்குலாம் (மடல்) |
| | 2. ஓடரிக்கண் (ஊசல்) |
| | 3. வட்டன்றோ (சம்பிரதம்) |
| | 4. பகையின்றி... (மதங்கு) |
| | எனத் தொடங்கும் பாடல்கள். |

அலகு 4 : சமய இலக்கியங்கள்

- | | | |
|-------------------------|---|---|
| 1. அற்புதத் திருவந்தாதி | - | 11 முதல் 15 பாடல்கள் |
| 2. நாச்சியார் திருமொழி | - | 1 முதல் 5 வரை |
| 3. இரட்சணிய மனோகரம் | - | கையடைப்பதிகம் (1-5) |
| 4. சீறாப்புராணம் | - | விலாதத்துக்காண்டம் - நபியவதாரப்படலம் (101-105 பாடல்கள்) |

அலகு 5 : மொழிப் பயன்பாடு

தொடர்ப்பிழை, ஒற்றுப்பிழை நீக்குதல், கடிதம் எழுதுதல் - நேர்காணல்.

பார்வை நூல்கள் :

1. பாரதியார் கவிதைகள், என்.சி.பி.எச்., சென்னை, 2009
2. பாரதிதாசன் கவிதைகள், என்.சி.பி.எச்., சென்னை, 2009
3. தேன்மழை, சுரதா, பாரிநிலையம், சென்னை-1.
4. குக்கூ, மீரா, அன்னம் - அகரம், தஞ்சாவூர்.
5. புதுமைப்பித்தன், சிறுகதைக் களஞ்சியம், ராமையா பதிப்பகம், சென்னை-5, 2005.
6. நல்வாழ்வு, மு. வரதராசன், பாரிநிலையம், சென்னை.
7. தமிழின் சிறப்பு, கி.ஆ.பெ. விசுவநாதன், பாரிநிலையம், சென்னை-1, 2003.
8. மொழிப் பயன்பாடு, த. பட்டாபிராமன், என்.சி.பி.எச்., சென்னை, 2009.
9. நந்திக்கலம்பகம், சீதை பதிப்பகம், சென்னை-5, 2010.
10. திருக்குற்றாலக் குறவஞ்சி, பூம்புகார் பதிப்பகம், சென்னை-108, 2001.
11. முக்கூடற்பள்ளு, சாரதா பதிப்பகம், சென்னை-14, 2012.
12. இரட்சணிய மனோகரம், முல்லை நிலையம், தி.நகர், சென்னை-17, 2001.
13. சீறாப்புராணம், முல்லை நிலையம், சென்னை-17, 2009.

சிறப்புத் தமிழ் - பாடத்திட்டம்

நான்காம் பருவம்

தாள் 2

சங்க இலக்கியங்கள், காப்பியங்கள், பொதுக்கட்டுரைகள்

அலகு 1 : சங்க இலக்கியம் - எட்டுத்தொகை

- 1) குறுந்தொகை – பாடல் எண்கள். 21, 31, 44, 67, 84
- 2) புறநானூறு – பாடல் எண்கள். 39, 44, 50, 67, 144

அலகு 2 : சங்க இலக்கியம் - பத்துப்பாட்டு

- 1) பொருநராற்றுப்படை – அரசனின் விருந்தோம்பல் முறை (103 - 129 அடிவரை)
- 2) நெடுநல்வாடை – 36 முதல் 72 அடிகள் வரை

அலகு 3 : காப்பியங்கள்

- 1) சிலப்பதிகாரம் - புகார்க்காண்டம் - கனாத்திறம் உரைத்த காதை
- 2) கம்பராமாயணம் - கிட்கிந்தா காண்டம் - வாலிவதைப்படலம் (81-120)

அலகு 4 : நீதி இலக்கியங்கள்

- 1) திருக்குறள் - பொறையுடைமை அதிகாரம்
- 2) நாலடியார் - யாக்கை நிலையாமை அதிகாரத்தில் முதல் 5 பாடல்கள்

அலகு 5 : பொதுக்கட்டுரை எழுதுதல்

தமிழும் அறிவியலும், இயற்கைவளம் காத்தல், கணினித்தமிழ் - ஆகிய தலைப்புகளில் கட்டுரை எழுதப் பயிற்சியளித்தல்.

திருவள்ளூர் பல்கலைக்கழகம்
தமிழல்லாத பிறமொழி மாணாக்கருக்குரிய தமிழ்ப் பாடத்திட்டம்
(CBCS PATTERN)

(This syllabus needs Transliteration as well as Translation in English)

(தொடக்க நிலையில் பாடத்திட்டத்தை ஆங்கில ஒலி பெயர்ப்புடனும் மொழி
பெயர்ப்புடனும் கற்பிப்பது நலம்)

மூன்றாம் பருவம்

அலகு - 1

எளிய முறையில் தமிழ் கற்றல்

1. கட்டடம் - சட்டம் - பட்டம் - வட்டம் - மட்டம் - மாமா
2. பாடம் - மாடம் - வடம் - கட்டி - தட்டி - மாமி
3. பட்டி - பாட்டி - கடை - சடை - தடை - வடை - மாதா - பிதா
4. படி - மடி - பாடி - மாடி - சாதம் - மாதம் - கார் - தார் - வான் - மான் - மாதம்
5. படை - மடை - பாட - சாவி - காவி - தாள் - வாள் - வால் - அம்மா - அப்பா
6. பாப்பா
7. தாத்தா
8. பாட்டு

சிறுதொடர்

பாப்பா படி - பாட்டி தட்டு - கட்டடம் கட்டித்தா - பாப்பா பாடம் படி - பாட்டி
வடைத்தட்டு

- பாப்பா பாட்டு பாடு - பாட்டி கடை - அம்மா சாதம் தா

பயிற்சி

குடும்பத்தினர் (அ) நண்பருடன் பேச்சுத் தமிழில் உரையாடல் குறில் நெடில் வேறுபாட்டால்
பொருள் மாறுபடும் சொற்கள் :

கரம் - காரம், சதம் - சாதம், மடம் - மாடம், தரம் - தாரம்

சரம் - சாரம், குடம் - கூடம், வரம் - வாரம், படம் - பாடம்

அலகு - 2

உயிரெழுத்துக்கள் - ஆய்த எழுத்து, மெய்யெழுத்துக்கள் - வகை,
எண்ணிக்கையுடன் அறிதல்

அலகு - 3

உயிர்மெய் எழுத்துக்கள் உருவாதலைக் கற்றல் :

வல்லினமெய்கள் (க் ச் ட் த் ப் ற்)

க் + அ = க ற் + ஒள = றௌ

K + A = KA RR + OU = RROU

மெல்லினமெய்கள் (ங் ஞ் ண் ந் ம் ன்)

ங் + அ = ங ன் + ஒள = னௌ

NG + A = NGA N + OU = NOU

இடையின மெய்கள் (ய் ர் ல் வ் ழ் ள்)

ய் + அ = ய ள் + ஒள = ளௌ

ஒலிவேறுபாட்டால் பொருள் மாற்றம்

ஒவ்வொன்றிற்கும் ஐந்து எடுத்துக்காட்டு தருக.

அரம் - அறம்

உன் - உண்

வால் - வாள் - வாழ்

அலகு - 4

சொல் வகை :

ஒரெழுத்து ஒருமொழி

பெயர் : ஆ, பூ, தீ, தை, கை, கா (சோலை)

வினை : வா, போ, ஈ (கொடு)

தா, கா (காத்தல்)

ஈரெழுத்து ஒருமொழி

பெயர் : கனி, பனி, வான், காடு, வீடு, மாடு

வினை : நில், படி, பார், காண், எழு, எடு, தொடு, படு

தொடர்மொழி பெயர்

கம்பர், கபிலர், திருவள்ளுவர், பாரதியார், ஆண்டாள், ஓளவையார், முக்கனி, முத்தமிழ், முவேந்தர், நாற்றிசை, ஐம்பொறி இவற்றிற்கு விளக்கம் தருக.

முறைப்பெயர் : (உறவுப்பெயர்) அம்மா, அப்பா, மாமி, மாமா, தாத்தா, பாட்டி, அண்ணன், தம்பி, தங்கை

அலகு - 5

உடலுறுப்புப் பெயர்கள் :

தலை முதல் அடி (கால்) வரை உள்ள உறுப்புகள்

முதலெழுத்து மாற்றத்தால் பொருள் மாற்றம் பெறும் உடலுறுப்புக்கள் சான்றாக.

அலை - இலை - தலை

ஆல் - பால் - கால்

நாக்கு - மூக்கு

எழுத்து - கழுத்து

கல் - பல்

கிழி - விழி

கொடை - தொடை

படி - அடி

பண் - மண் - கண்

பாக்கு - வாக்கு - நாக்கு

மரம் - வரம் - கரம்

மாது - காது

பறவைப் பெயர்கள் :

அன்னம், காகம், குருவி, குயில், கிளி, புறா, மயில்

வீட்டு விலங்குகள் :

ஆடு, பசு, மாடு, குதிரை, நாய், பூனை

மலர்கள் :

தாமரை, மல்லிகை, அல்லி, முல்லை, செண்பகம், குறிஞ்சி

நிறங்கள் :

வானவில்லின் வண்ணங்கள் - அறிதல்

எண்கள் :

ஒன்று முதல் பத்து (10) வரை எழுத்தால் எழுதுதல்

சிறுகதை :

நேர்மை தந்த பரிசு - தமிழ் மூன்றாம் வகுப்பு, தமிழ்நாட்டுப் பாடநூல் கழகம்,

சென்னை - 2011.

நேர்மை தந்த பரிசு

சீனாவில் ஓர் இளவரசன் இருந்தான். அவன் நாட்டிற்கு அரசனாகப் பொறுப்பேற்கும் முன் திருமணம் செய்துகொள்ள முடிவெடுத்தான். அவன் திருமணம் செய்து கொள்ளும் பெண்ணை அந்நாட்டிற்குப் பேரரசி. எனவே மிகவும் நேர்மையான ஒரு பெண்ணைத் தேர்வு செய்யத் தீர்மானித்தான். அதற்காகப் பெரியோர்களின் அறிவுரைப்படி அந்நாட்டிலுள்ள இளம்பெண்களை அழைத்தான். அழைப்பை ஏற்று வந்திருந்த பெண்களிடம் இளவரசன் தன் திட்டத்தை அறிவித்தான்.

பெண்களே . . . உங்கள் ஒவ்வொருவருக்கும் ஒரு விதை தருகிறேன். இதனை ஆறு மாதங்களில் யார் நன்றாக வளர்க்கிறாரோ அவரையே இந்நாட்டின் பேராசிரியராகத் தேர்வு செய்வேன் என்றான். ஆளுக்கொரு விதையைக் கொடுத்தான்.

அந்த அரண்மனையில் பணியாற்றும் ஏழைப் பணிப்பெண்ணின் மகளும் இளவரசனின் அறிவிப்பைக் கேட்டு அந்த விதையைப் பெற்றாள். அதனை வீட்டிற்கு எடுத்துச் சென்று தொட்டியில் மண் நிரப்பி, நீர்த்தெளித்து, விதையை அதில் ஊன்றினாள். கண்ணுங்கருத்துமாகப் பார்த்து வந்தாள். அவள் உழைப்பிற்கு ஏற்ப, பெரிய மலர்கள் மலர வேண்டும் என்று எப்போதும் நினைத்தாள். மூன்று மாதங்கள் சென்றன. விதை சிறிதும் முளைக்கவில்லை. கவலையுற்ற அவளோ, உழவர்கள், சிலரிடம் சென்றாள். அவர்களிடம் செடி வளர்ப்பது குறித்துக் கேட்டாள். அதன்படியும் முயன்றாள். ஆனால் ஒரு பயனும் இல்லை.

இறுதியாக ஆறு மாதங்களும் கழிந்தன. இளவரசன் குறிப்பிட்ட அந்த நாளும் வந்தது. கவனத்துடன் தன் உழைப்பைச் செலுத்தியும் செடி முளைக்கவில்லை. ஆனாலும், செடியில்லாத மண் தொட்டியுடன் அரண்மனைக்குச் சென்றாள். அவளைத் தவிர மற்ற பெண்கள் அனைவரும் வண்ணவண்ண மலர்கள் மலர்ந்த அழகிய பூந்தொட்டியுடன் வந்திருந்தனர்.

இளவரசன் வந்தான். மற்றவர்கள் வைத்திருக்கும் மலர்த் தொட்டிகளைப் பார்த்தான். பணிப்பெண்ணின் மகள் வைத்திருந்த மண்தொட்டியையும் பார்த்துவிட்டுத் தன் முடிவினை அறிவித்தான். வெறுந்தொட்டியுடன் வந்த பெண்ணையே பேரரசியாகத் தேர்வு செய்துள்ளேன் என்றான்.

மற்ற பெண்கள் இதனை எதிர்த்தனர். ஒன்றுமே முளைக்காத வெறுந்தொட்டியுடன் வந்தவளை எப்படிப் பேரரசியாக்க முடியும் என்று வினவினர். இளவரசனோ மிகவும் பொறுமையாக, இந்த பெண் மட்டுந்தான் நேர்மை என்னும் மலரைப் பயிர் செய்தாள். ஆம்! நான் கொடுத்த விதைகள் எல்லாம் முளைக்காத விதைகளே என்றான். மற்ற பெண்கள் ஒன்றும் கூறமுடியாமல் அமைதியாக நின்றனர்.

பயிற்சிகள்

அ) அகரமுதலியைப் பார்த்துப் பொருள் கூறுங்கள், எழுதுங்கள்

1. பணிப்பெண் =
2. அரண்மனை =
3. நேர்மை =

ஆ) சேர்த்து எழுதுங்கள்

எடுத்துக்காட்டு : பொறுப்பு + ஏற்கும் = பொறுப்பேற்கும்

1. பணி + பெண் =
2. கேட்டு + அறிந்தாள் =
3. முழு + கவனத்துடன் =
4. பூ + தொட்டி =

இ) பிரித்து எழுதுங்கள்

எடுத்துக்காட்டு : அறிவிப்பைக்கேட்டு = அறிவிப்பை + கேட்டு

1. விதையைப்பெற்றாள் =
2. செடியில்லா =
3. மண்தொட்டி =
4. மலர்த்தொட்டி =

ஈ) ஓரிரு சொற்கள் / சொற்றொடர்களில் வினாக்களுக்கு விடை எழுதுங்கள்

1. இளவரசன் போட்டியில் பங்கேற்க வந்தவர்களிடம் என்ன கொடுத்தான்?
2. பணிப்பெண்ணின் மகள் விதையை எடுத்துச் சென்று என்ன செய்தாள்?
3. விதையை முளைக்க வைக்க யாரிடம் சென்று அறிவுரை கேட்டாள்?
4. பேரரசியாக இளவரசன் யாரைத் தேர்வு செய்தான்?
5. ஏழைப் பெண்ணைப் பேரரசியாகத் தேர்வு செய்ய இளவரசன் சொன்ன காரணம் என்ன?

உ) விடுபட்ட சொற்களைக் கீழ்க்காணும் குறிப்புகளைக் கொண்டு நிரப்புவோம்

(தூண்டில், மீன்கொத்தி, காகம், தாமரை, மலர்கள், மையப்பகுதி, மரங்கள்)

எங்கள் ஊரில் உள்ள நீர் நிரம்பிய குளத்தில் சிவப்பு, வெள்ளைத்
அழகாகப் பூத்திருக்கின்றன. குளக்கரையின் நான்கு பக்கமும் உள்ளன.
மரத்தின் மீது, போன்ற பறவைகள் அமர்ந்து
இருக்கின்றன. குளக்கரையில் அமர்ந்து ஒருவர் போட்டு மீன் பிடித்துக்
கொண்டிருக்கிறார். சிலர் குளத்தின் வரை நீந்திச் செல்கின்றனர்.
தாமரைக் குளம்தான் எவ்வளவு அழகு!

நூறு வயது தருவன!

உடலின் உறுதி உடையவரே
உலகில் இன்பம் உடையவராம்
இடமும் பொருளும் நோயாளிக்கு
இனிய வாழ்வு தந்திடுமோ?

சுத்தமுள்ள இடமெங்கும்
சுகமும் உண்டு நீயதனை
நித்தம் நித்தம் பேணுவையேல்,
நீண்ட ஆயுள் பெறுவாயே!

காலை மாலை உலாவிநிதம்
காற்று வாங்கி வருவோரின்
காலைத் தொட்டுக் கும்பிட்டுக்
காலன் ஓடிப் போவானே!

கூழை யேநீ குடித்தாலும்
குளித்த பிறகு குடியப்பா!
ஏழை யேநீ ஆனாலும்
இரவில் நன்றாய் உறங்கப்பா!

தூய காற்றும் நன்னீரும்
சுண்டப் பசித்த பின்உணவும்,
நோயை ஓட்டி விடுமப்பா
நூறு வயதும் தருமப்பா!

- கவிமணி தேசிக விநாயகம் பிள்ளை

சொல்பொருள் :

- | | | | |
|----|----------------|---|--------------|
| 1. | நித்தம் | - | நாள்தோறும் |
| 2. | பேணுதல் | - | பாதுகாத்தல் |
| 3. | ஆயுள் | - | வாழ்நாள் |
| 4. | உலாவி | - | நடந்து |
| 5. | சுண்டப் பசித்த | - | நன்கு பசித்த |
| 6. | காலன் | - | எமன் |

பயிற்சிகள்

அ. வகுப்பறையில் பேசுக :

1. உன் பள்ளியில் .∴ ஊரில் விளையாடும் விளையாட்டுகள் பற்றிக் கூறுக.
2. நோயற்ற வாழ்வே குறைவற்ற செல்வம் என்பதைக் குறித்துப் பேசுக.

ஆ. பிரித்து எழுதுக :

- | | | | |
|----|------------|---|-------|
| 1. | இடமெங்கும் | = | |
| 2. | நன்னீர் | = | |
| 3. | உறங்கப்பா | = | |
| 4. | நீயதனை | = | |

இ. கோடிட்ட இடத்தை நிரப்புக :

1. நம்மைச் சுற்றியுள்ள இடத்தை வைத்திருக்க வேண்டும்.
2. நன்கு பின்னரே உணவு உண்ண வேண்டும்.
3. உடலைத் தூய்மையாக வைக்க நாள்தோறும் வேண்டும்.
4. சுத்தம் தரும்.

ஈ. இப்பாடலுடன் தொடர்புடைய பழமொழிகளை எழுதுக.

(எ.கா) : கூழானாலும் குளித்துக்குடி

1.
2.
3.

ஒ. ஓர் எழுத்தைச் சேர்த்தும் நீக்கியும் புதிய சொல் உருவாக்குக :

(எ.கா) மகள் - மக்கள்

(எ.கா) வளையல் - வயல்

- | | |
|------------------|--------------------|
| 1. படம் - | 1. உணர்வு - |
| 2. விதை - | 2. கோட்டை - |
| 3. பாடு - | 3. புயல் - |
| 4. முறம் - | 4. அரும்பு - |
| 5. கல் - | 5. மந்தி - |

உ. விடை எழுதுக

1. எப்பொழுது உண்ண வேண்டும்?
2. எவரைக் கண்டால் எமன் ஓடிப்போவான்?
3. நூறு வயது தருவன எவை?

கொடிக்குக் காய் பாராமா?

வேங்கை நாடு ஓர் அழகிய சிறுநாடு. அந்நாட்டை வேங்கை மார்பன் என்னும் மன்னர் ஆண்டு வந்தார். அவர் வயதில் இளையவர். இளைஞர்களால்தான் நாடு முன்னேறும், வயதானவர்கள் இந்த நாட்டுக்குத் தேவையில்லை என்று நினைத்தார்.

மன்னர், தலைமை அமைச்சரை அழைத்து, வயதானவர்களால் நாட்டுக்கு ஒன்றும் பயனில்லை. அவர்களால் எப்பொழுதும் தொல்லைதான் அவர்களை என்ன செய்யலாம்? என்று கேட்டார்.

தலைமை அமைச்சருக்கு ஒரே வியப்பு! வயதானவர்களால் பயன் ஒன்றும் இல்லையா? அவர்கள் வீட்டிற்கும் நாட்டிற்கும் சுமையா? கொடிக்குக் காய் பாரமாகுமா? என்று நினைத்தார். ஆனால், அரசனின் ஆணை அல்லவா! அதனால் அவர், வயதானவர்களை நாடு கடத்திவிடலாம் என்றார். அப்படியே செய்யுங்கள் என்று மன்னரும் ஆணையிட்டார்.

நாடெங்கும் ஒரே பரபரப்பு. அரசரின் ஆணை நாடெங்கும் முரசறைந்து அறிவிக்கப்பட்டது. எல்லாக் குடும்பத்தினரும் மிக்க வருத்தத்தோடு வயதானவர்களை எல்லாம் அண்டை நாடுகளுக்கு அனுப்பிவிட்டார்கள். ஆனால், மதிவாணன் என்னும் இளைஞன், தன் வயதான தந்தையின்மீது கொண்ட அன்பால் அவ்வாறு செய்யவில்லை. தன் வீட்டிலேயே ஒரு மறைவான இடத்தில் வைத்துப் பாதுகாத்து வந்தான்.

ஒருநாள், வேங்கை நாட்டு அரசவைக்கு விருந்தினராக ஓர் அறிஞர் வந்தார். அவர் பெயர் செழியன். வேங்கைமார்பன் அவரை அன்புடன் வரவேற்றார். அவையில் அமர வைத்தார். அறிஞர் செழியன் அவையினரைப் பார்த்து, இந்நாட்டில் நான் சொல்வது போல் செய்யக்கூடிய ஆற்றல் உள்ளவர் எவரேனும் உண்டா? என்று வினா எழுப்பினார். மன்னரும் அவையினரும் என்ன செயல் அது? என்று வினவினர்.

சாம்பலைக் கயிறாகத் திரிக்க வேண்டும், வெண்சங்கில் நூலைக் கோத்துத் தரவேண்டும் - செய்யமுடியுமா? என்று கேட்டு ஏளனமாகச் சிரித்தார் செழியன். சாம்பலைக் கயிறாகத் திரிப்பதா! என்ன கோமாளித்தனம்! என்றார் மன்னர். அவையினரோ, இதில் ஏதோ சூழ்ச்சி இருக்கிறது என்றனர்.

அவையினரை நோக்கி, யாரேனும் இச்செயலைச் செய்து காட்ட முடியுமா? என்று அரசர் வினவினார். எல்லாரும் அமைதியாக இருந்துவிட்டனர்.

மன்னர், புதிதாக வந்த அறிஞரிடம், இரண்டு நாள்கள் பொறுங்கள், நீங்கள் சொன்னதைச் செய்து காட்டுவோம் என்றார். அவை கலைந்தது.

மறுநாள் முரசறைந்து, பொதுமக்களுக்கு இச்செய்தி தெரிவிக்கப்பட்டது. அறிஞர் கூறிய செயல்களைச் செய்பவருக்கு ஆயிரம் பொற்காசுகள் வழங்கப்படும் என்றும் அறிவிக்கப்பட்டது.

மதிவாணன், தன் தந்தையிடம் இதைக் கூறினான். தந்தையோ, இவ்வளவுதானே! நான் சொல்லுகிறபடி செய்து, அதை அரண்மனைக்கு எடுத்துச் செல் என்றார். மதிவாணன் அரசவை சென்றான்.

ஒரு தட்டில் சாம்பலால் ஆன கயிறை வைத்து அரசவையில் காட்டினான். சங்கில் நூலைக் கோத்தும் வைத்திருந்தான். எல்லாரும் கைத்தட்டி ஆரவாரம் செய்தனர். ஆகா! எப்படி! எப்படி! என்று அனைவரும் வியந்தனர்.

மன்னர், ஆயிரம் பொற்காசுகளைத் தட்டில் வைத்து மதிவாணனுக்குப் பரிசாக அளித்தார். மன்னர் மதிவாணனைப் பார்த்து, இதை எப்படிச் செய்தாய்? என்று வினவினார்.

இளைஞன் மன்னனை நோக்கி, அரசே! அஃது எளிது. ஒரு கயிறைத் துண்டு துண்டாக வெட்டினேன். ஒரு துண்டைத் தட்டில் வைத்தேன், அதைத் தீ வைத்துக்

கொளுத்தினேன். அது பற்றி எரிந்தது. தீ அணைந்தபின் சாம்பல் கயிறு போலக் காட்சியளித்தது. அதனைக் கலையாமல் கொண்டுவந்து காட்டினேன் என்றான். அதுசரி, சங்கில் நூல் எவ்வாறு ஒருபக்கம் இருந்து மறுபக்கம் சென்றது? என்று மன்னர் வினவினார்.

ஒரு கட்டெலும்பில் மெல்லிய நூலைக் காட்டினேன். சங்கின் எதிர்புறத்தில் கற்கண்டுத் துண்டு ஒன்றை வைத்தேன். எறும்பு தானாகச் சங்கினுள் நுழைந்து கற்கண்டை நோக்கி எதிர்புறம் வந்துவிட்டது. எறும்பை விட்டுவிட்டேன். நூலைக் கோத்துவிட்டேன் என்றான் மதிவாணன். நன்று! நன்று! ஆனால், இந்தச் செயலை நீயாகச் செய்தாயா? வேறு யாரேனும் உனக்குச் சொல்லிக் கொடுத்தார்களா? என்றார் மன்னர்.

மதிவாணன் சிறிது நேரம் அமைதியாக நின்றான். பிறகு, அரசே! தங்கள் ஆணையை மீறிவிட்டதற்குப் பொறுத்தருள வேண்டும். நான், வயதான என் தந்தையை யாருக்கும் தெரியாமல் வீட்டிலேயே வைத்துப் பாதுகாத்து வருகிறேன். அவர்தான் இந்தச் செயலைச் செய்ய எனக்கு வழிகாட்டினார் என்றான்.

மன்னர்க்குத் தெளிவு ஏற்பட்டது. வயதான முதியவர்களால் நாட்டுக்குக் கேடு ஒன்றும் இல்லை. ஒருநாடு முன்னேற வேண்டுமானால் இளைஞர்களின் செயல் வேகமும், வயதானவர்களின் பட்டறிவும், அவர்தம் வழிகாட்டலும் தேவை என்பதை உணர்ந்தார். வயதானவர்கள் அனைவரும் நாடு திரும்ப மன்னர் ஆணை பிறப்பித்தார். மக்கள் மகிழ்ந்தனர்.

படிப்போம்! சிந்திப்போம்! எழுதுவோம்

1. அகர முதலியைப் பார்த்துப் பொருள் எழுதுக.

ஆணை
ஏளனம்
பாரம்

அறிஞர்

கேடு

2. பிரித்து எழுதுக :

வயதானவர்

அரசாணை

முரசறைந்து

அரசவை

காட்சியளித்தது

3. சேர்த்தெழுதுக :

பயன் + இல்லை =

பொன் + காசு =

கல் + கண்டு =

பொறுத்து + அருள் =

4. கோடிட்ட இடத்தை நிரப்புக :

1. அமைச்சர் வயதானவர்களை கடத்திவிடலாம் என்றார்.
2. அரசவைக்கு வந்த அறிஞரின் பெயர்
3. சாம்பலைக் திரிக்க வேண்டும்
4. எறும்பு சங்கின் எதிர்ப்புறம் வரதுண்டு வைக்கப்பட்டது.
5. நாடு முன்னேற வயதானவர்களின்அவர்தம் தேவை.

5. விடையளிக்க :

1. வேங்கை நாட்டை ஆண்டு வந்த மன்னர் யார்?
2. அரசரின் ஆணை யாது?

3. மதிவாணன் தன் தந்தையை எங்கே மறைத்து வைத்தான்?
4. அறிஞர் கூறிய செயலைச் செய்பவர்க்கு மன்னர் அறிவித்த பரிசு யாது?
5. மதிவாணன், என்னைப் பொறுத்தருள வேண்டும் என்று ஏன் கூறினான்?

6. ஆறு வரிகளுக்கு மிகாமல் விடை தருக :

1. வெளிநாட்டிலிருந்து வந்த அறிஞர் கூறிய செயல்கள் யாவை?
2. சங்கின் எதிர்ப்புறத்தில் கட்டெறும்பு வந்தது எப்படி?
3. சாம்பலில் கயிறு செய்தது எப்படி?

தெரிந்து கொள்வோம்

திணை

திணை என்னும் சொல்லுக்கு ஒழுக்கம் என்பது பொருள். ஒழுக்கமுடைய மனிதர்களை உயர்திணை என்றும் உயர்திணை அல்லாதவற்றை அ.:றிணை (அல் திணை) என்றும் தமிழ் இலக்கணம் பாகுபடுத்தும்.

உயர்திணை - மன்னன், மக்கள்

அ.:றிணை - குரங்கு, யானை, கடல், மலை

விடையளிக்க

1. திணை எத்தனை வகைப்படும்? அவை யாவை?
2. பின்வரும் சொற்களை வகைப்படுத்துக.

அரசன், மரம், பொன்னன், தாமரை, கல், கண்ணகி, கால், வேலன், சங்கு, ஆசிரியர், கரிகாலன், புறா, மருத்துவர்

உயர்திணை

அ.:றிணை

மூன்று பொற்காசுகள்

நாகப்பன் பெருஞ்செல்வந்தர். அவர் தன்னிடம் வேலையில் சேர்பவர்களுக்கு ஆண்டு முடிவில் மூன்று பொற்காசுகள் ஊதியமாக வழங்குவார். அதற்குமுன் அறிவைச் சோதிப்பதற்கு மூன்று செயல்களைக் கொடுப்பார். அவற்றைச் சரியாகச் செய்து முடிக்க வேண்டும். இல்லையெனில் ஒவ்வொரு செயலுக்கும் ஊதியத்திலிருந்து ஒரு பொற்காசைக் குறைத்துக் கொள்வார்.

இந்நிபந்தனைகளை ஒப்புக்கொள்பவரையே வேலையில் சேர்த்துக் கொள்வார். நாகப்பனிடம் வேலையில் சேர்ந்த எவரும் இதுவரை ஊதியம் பெற்றதில்லை. ஏனெனில், ஆண்டு முடிவில் அவர் தரும் செயல்களைச் செய்ய முடியாமல் தோல்வியடைந்து வெறுங்கையுடன்தான் சென்றுள்ளனர். இவ்வாறாக நாகப்பன் வேலையாளர்களுக்கு ஊதியம் தராமல் ஏமாற்றி வந்தார்.

நாகப்பனின் ஏமாற்றுத்தனத்தை அறிந்த அறிவுநம்பி அவருக்குச் சரியான பாடம் புகட்ட எண்ணினான். நாகப்பனின் நிபந்தனைகளை ஒப்புக்கொண்டு வேலையில் சேர்ந்தான். ஓராண்டு முடிவில் ஐயா, நான் பணியில் சேர்ந்து இன்றோடு ஓராண்டு நிறைவடைகிறது ஊதியம் வேண்டும் என்றான். அப்படியா! நிபந்தனைகள் நினைவிருக்கிறதல்லவா? என்று கேட்டார் நாகப்பன்.

அறிவுநம்பி, ஐயா, நன்றாக நினைவிருக்கிறது என்றான். இவ்வூரில் எத்தனை காகங்கள் இருக்கின்றன? எண்ணிச்சொல். இதுதான் முதல் வேலை என்றார் நாகப்பன். ஆயிரத்துப்பத்து என்றான் அறிவுநம்பி. உடனடி பதிலைக் கேட்ட நாகப்பன் சற்றே அதிர்ச்சியடைந்தார். அது எப்படி? என்றார். அறிவுநம்பி சற்றும் தயங்காமல் ஐயமிருந்தால் காகங்களை எண்ணிப்பாருங்கள் எனச் சிரித்துக் கொண்டே சொன்னான். ஆயிரத்துப்பத்துக் காகங்களை விட அதிகமாக இருந்தால் என்ன செய்வது?

அதிகமாக இருந்தால் அவை வெளியூரில் இருந்து வந்தவையாக இருக்கும் என்றான் அறிவுநம்பி. எண்ணிக்கை குறைவாக இருந்தால் என்று நாகப்பன் கேட்டவுடன் இங்குள்ளவை வெளியூருக்குச் சென்றிருக்கும் என்று கூறிக் கலகலவெனச் சிரித்தான் அறிவுநம்பி.

திருவள்ளூர் பல்கலைக்கழகம்
தமிழல்லாத பிறமொழி மாணாக்கருக்குரிய தமிழ்ப் பாடத்திட்டம்
(CBCS PATTERN)

நான்காம் பருவம்

அலகு - 1

அ) அகர வரிசையில் அமைத்தல் (ஒவ்வொன்றிற்கும் 10 பெயர்கள்)

ஊர்ப்பெயர்கள், தமிழ்ப் புலவர்கள், தமிழ் இலக்கிய நூல்கள்

ஆ) பிழை நீக்கி எழுதுதல்

1. அரம் செய்ய விரும்பு
2. ஆளும் வேளும் பல்லுக்கு உறுதி.
3. இங்கு விரகு விற்கப்படும்.
4. உணக்கு உனவு தேவையா?
5. எண்ணை குவியல் நல்லது.
6. ஐந்தின் வலையாதது ஐம்பதில் வளையுமா?
7. கம்பன் வீட்டும் கட்டுத் தரியும் கவிபாடும்.
8. நான் கள்ளுரிக்குச் செல்வேன்.
9. பணிவுடைமை நள்ள பண்பு.
10. பேருந்து நிருத்தும் இடம்.

அலகு - 2

அ) ஐம்பால், மூவிடம் அறிதல்

ஆ) சேர்த்து எழுதுதல் : சுட்டு, வினா, திசைப்பெயர் - அடிப்படையிலான சொற்கள் :

| | |
|----------------------------|------------------------------|
| எ.கா. அ + இடம் = அவ்விடம் | இ + படம் = இப்படம் |
| எ + பையன் = எப்பையன் | எ + படம் = எப்படம் |
| வடக்கு + மேற்கு = வடமேற்கு | தெற்கு + மேற்கு = தென்மேற்கு |

இ) பிரித்து எழுதுதல் : கனி, மரம் - இவற்றின் அடிப்படையிலான சொற்கள்

| | |
|--------------------|-------------|
| எ.கா. வாழைப்பழம் = | வாழை + பழம் |
| பலாப்பழம் = | பலா + பழம் |
| மரவேர் = | மரம் + வேர் |
| மரக்கிளை = | மரம் + கிளை |

ஈ) எதிர்ச்சொல் தருதல் : பண்பு அடிப்படையிலான சொற்கள்

| | | |
|-------------|---|--------|
| எ.கா. நன்மை | X | தீமை |
| நல்ல | X | கெட்ட |
| உயரம் | X | குட்டை |
| குண்டு | X | ஒல்லி |

அலகு - 3

செய்யுள்

அ) ஆத்திசூடி, கொன்றை வேந்தன்

அறஞ்செய விரும்பு

ஆறுவது சினம்

இயல்வது கரவேல்

ஈவது விலக்கேல்

உடையது விளம்பேல்

ஊக்கமது கைவிடேல்

எண் எழுத்து இகழேல்

ஏற்பது இகழ்ச்சி

ஐயம் இட்டுஉண்

ஒப்புரவு ஒழுகு

ஒதுவது ஒழியேல்

ஒளவியம் பேசேல்

அ.கஞ் சுருக்கேல்

ஆ) நூறுவயது தருவன -- கவிமணி தேசிக விநாயகம் பிள்ளை

தமிழ் - ஐந்தாம் வகுப்பு - தமிழ்நாட்டுப் பாடநூல் கழகம் - சென்னை - 2011.

இ) திருக்குறள்

அதிகாரம் - ஒழுக்கமுடைமை குறள் எண் - 8

அதிகாரம் - தெரிந்து செயல்வகை குறள் எண் - 7

அதிகாரம் - ஆள்வினை உடைமை குறள் எண் - 6

அதிகாரம் - தெரிந்து தெளிதல் குறள் எண் - 4

அதிகாரம் - ஊக்கம் உடைமை குறள் எண் - 5

அலகு - 4

கதைகள்

1. கொடிக்குக் காய் பாரமா? - தமிழ், நான்காம் வகுப்பு
தமிழ் நாட்டுப் பாடநூல் கழகம், சென்னை - 2011.
2. மூன்று பொற்காசுகள் - தமிழ், ஐந்தாம் வகுப்பு
தமிழ்நாட்டுப் பாடநூல் கழகம், சென்னை - 2011.

அலகு - 5

தமிழில் மொழிபெயர்க்க :

TELEPHONE, CELLPHONE, COMPUTER, INTERNET, FAX, E-MAIL, XEROX,
DEMAND DRAFT, MICRO - BIOLOGY, POST BOX, FIRST AID, OXYGEN,
GOVERNMENT ORDER

மரபுத் தொடர்களை மொழிபெயர்த்தல் :

All the glitters is not gold.

Haste makes waste

Health is wealth

Makes hay while the sun shines.

Time and tide wait for none.

Empty vessels make grater sound.

Barking dog seldom bite.

Rome was not built in a day.

ஆங்கிலத்தில் மொழி பெயர்க்க :

தமிழ்நாட்டின் தலைநகர் சென்னை

தமிழகத்தின் நெற்களஞ்சியம் தஞ்சாவூர்.

தமிழரின் முதன்மை உணவு அரிசிச் சோறு.

தமிழ்ப் பெண்கள் உடுத்துவது புடவை, ஆண்கள் கட்டுவது வேட்டி.

தமிழரின் தலைமையான திருவிழா பொங்கல்.

நேர்காணல் :

அறிவியல் அறிஞர், அரசியல் தலைவர், சமூகத் தொண்டர், விளையாட்டு வீரர், கலைத்துறையில் புகழ் பெற்றவர் ஒருவரை நேர்காணல்.

THIRUVALLUVAR UNIVERSITY

M.A. ENGLISH

SYLLABUS

UNDER CBCS (with effect from 2017-2018)

| Year/ Semester | Subject | Paper | Title of the Paper | Ins. Hrs/ week | Credits | Max. Marks | | |
|--|---------------------|----------|--|----------------------|-----------|------------|--------------|------------|
| | | | | | | CIA | Uni. Exam | Total |
| I Year/ I S E M E S T E R | CORE | 1 | Chaucer and Elizabethan Literature | 6 | 4 | 25 | 75 | 100 |
| | CORE | 2 | American Literature | 6 | 4 | 25 | 75 | 100 |
| | CORE | 3 | Indian Literature in English | 6 | 4 | 25 | 75 | 100 |
| | CORE | 4 | Modern English Grammar | 6 | 4 | 25 | 75 | 100 |
| | Elective I A | | Indian Writing in Translation | 6 | 4 | 25 | 75 | 100 |
| | Elective I B | | Classics in World Literature | | | | | |
| | Elective I C | | Women's Writing | | | | | |
| | | | | 30 | 20 | 125 | 375 | 500 |
| II S E M | CORE | 5 | Restoration and Eighteenth Century Literature | 5 | 5 | 25 | 75 | 100 |
| | CORE | 6 | The Romantic Revival Literature | 6 | 5 | 25 | 75 | 100 |
| | CORE | 7 | Language and Linguistics | 6 | 5 | 25 | 75 | 100 |

| | | | | | | | | |
|--|-----------------------------|-----------|---|-----------|-----------|------------|------------|------------|
| E S T E R | CORE | 8 | Literary Criticism | 6 | 5 | 25 | 75 | 100 |
| | Compulsory Paper | | Human Rights | 2 | 2 | 25 | 75 | 100 |
| | Elective II A | | Indian Diaspora Literature | 5 | 3 | 25 | 75 | 100 |
| | Elective II B | | Post colonial Studies | | | | | |
| | Elective II C | | New Literatures in English | | | | | |
| | | | | 30 | 25 | 150 | 450 | 600 |
| III S E M E S T E R | CORE | 9 | Shakespeare Studies | 6 | 5 | 25 | 75 | 100 |
| | CORE | 10 | Victorian Literature | 6 | 5 | 25 | 75 | 100 |
| | CORE | 11 | Contemporary Literary Theory– I | 6 | 5 | 25 | 75 | 100 |
| | CORE | 12 | Research Methodology | 6 | 4 | 25 | 75 | 100 |
| | Elective III A | | History of Ideas | 6 | 3 | 25 | 75 | 100 |
| | Elective III B | | Literature : Analysis, Approaches and Applications | | | | | |
| | Elective III C | | Translation Studies | | | | | |
| | | | | 30 | 22 | 125 | 375 | 500 |
| IV S E M E S T E | CORE | 13 | Twentieth Century Literature | 6 | 5 | 25 | 75 | 100 |
| | CORE | 14 | English Language Teaching | 6 | 5 | 25 | 75 | 100 |
| | CORE | 15 | Contemporary Literary Theory–II | 6 | 5 | 25 | 75 | 100 |
| | CORE | 16 | Research Project | 6 | 5 | 25 | 75 | 100 |
| | Elective IV A | | Children’s Literature | 6 | 3 | 25 | 75 | 100 |

| | | | | | | | | |
|----------|----------------------|--|--|-----------|-----------|------------|------------|------------|
| R | Elective IV B | | Academic Writing | | | | | |
| | Elective IV C | | Comprehensive Study of Literature | | | | | |
| | | | | 30 | 23 | 125 | 375 | 500 |

| Subject | Papers | Credit | Total Credits | Marks | Total Marks |
|-------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Main | 16 | 4-5 | 76 | 100 | 1600 |
| Elective | 4 | 3 | 12 | 100 | 400 |
| Compulsory Paper | 1 | 2 | 2 | 100 | 100 |
| Total | 21 | - | 90 | - | 2100 |

SEMESTER I
PAPER - 1
CHAUCE AND THE ELIZABETHAN LITERATURE

OBJECTIVES:

- To explore the literary traditions of the Elizabethan period that promoted the indigenization of the European forms such as the sonnet, allegory and the romance poem etc.
- To examine the cultural practices of the age which reflects in the writings and the transition from 11th to the 17th century

UNIT I: POETRY (Detailed)

- | | |
|---------------|--|
| 1. Chaucer | : Prologue to the Canterbury Tales: The Knight, The Prioress, The Wife of Bath, The Pardoner, The Monk |
| 2. John Donne | : 1. Batter My Heart 2. Valediction Forbidding Mourning |

UNIT II: POETRY (Non-Detailed)

- | | |
|-------------------|----------------------|
| 3. Edmund Spenser | : Epithalamion |
| 4. Thomas Wyatt | : Whoso List to Hunt |
| 5. Earl of Surrey | : The Soote Season |

UNIT III: PROSE (Detailed)

- | | |
|--|---|
| 1. Bacon | : Of Truth, of Revenge , Of Friendship, Of Love |
| 2. The Gospel according to St. Mark (MacMillan Annotated Classics) | |
| 3. Thomas More | : The Utopia – Book I (Non-Detailed) |

UNIT IV: DRAMA

- | | |
|--------------------------|-----------------------|
| 1. Thomas Kyd (Detailed) | : The Spanish Tragedy |
|--------------------------|-----------------------|

UNIT V: DRAMA (Non-Detailed)

- | | |
|------------------|---------------------------|
| 1. Thomas Dekker | : The Shoemaker's Holiday |
| 2. Webster | : The Duchess of Malfi |

BOOKS FOR STUDY AND REFERENCE

1. Fermor, Una Ellis - The Jacobian Drama - London: University Paperback, 1965.
2. Ford, Boris - A guide to English Literature. Vol 1. The Age of Chaucer - London: Penguin, 1961.
3. Grierson H.J.C. - Metaphysical Lyrics and Poems of the Seventeenth Century - Oxford University Press, 1972.
4. Rickert, Edith - Chaucer's World - London: Columbia University Press, 1964.

PAPER - 2

AMERICAN LITERATURE

OBJECTIVES:

- To enable the students to have an overview of major authors who have given significant contributions to the development of American literature.
- The social and political events that have influenced the literary movements can be understood by the study of representative authors

UNIT I: POETRY

(Detailed)

- | | |
|---------------------|--------------------------------|
| 1. Walt Whitman | : When the Lilacs last bloom'd |
| 2. Emily Dickinson | : I Felt a Funeral in My Brain |
| 3. Robert Frost | : Home Burial |
| 4. Adrienne Rich | : Diving into the Wreck |
| 5. Elizabeth Bishop | : The Fish |

(Non-detailed)

- | | |
|---------------------|--------------|
| 1. e.e. Cummings | : in Just- |
| 2. Carl Sandburg | : Chicago |
| 3. Gwendolyn Brooks | : The Mother |

UNIT II: PROSE

(Detailed)

- | | |
|-----------------|-----------------|
| 1. R.W. Emerson | : Self-Reliance |
|-----------------|-----------------|
- (Non-detailed)

- | | |
|-----------------|---|
| 2. H.D. Thoreau | : Walden Where I Lived and What I Lived For |
|-----------------|---|

UNIT III: DRAMA

- | | |
|------------------|--------------------------------------|
| 1. Arthur Miller | : The Death of a Salesman (Detailed) |
| 2. Edward Albee | : The American Dream (Non-detailed) |

UNIT IV: SHORT STORIES (Non-detailed)

- | | |
|------------------------|------------------------|
| 1. Nathaniel Hawthorne | : The Purloined Letter |
| 2. John Updike | : The Witness |
| 3. Pearl S. Buck | : The Quarrel |
| 4. John Steinbeck | : Flight |
| 5. Eudore Welty | : Worn Path |

UNIT V FICTION (Non-detailed)

- | | |
|-----------------------|--------------------------|
| . 1. Ernest Hemingway | : The Sun Also Rises |
| 2. Harper Lee | : To Kill a Mocking Bird |
| 3. Toni Morrison | : The Bluest Eye |

BOOKS FOR STUDY AND REFERENCE

1. Donald, Heiney and Lenteil H. Essentials of Contemporary Literature of the Western World, (Vol. 3 & 4). USA: Barron's Educational Series.
2. Gray, Richard. A Brief History of American Literature. UK: Wiley – Blackwell, 2011.
3. Hoffmann, Daniel. ed. Harvard Guide to Contemporary American Writing. London: Oxford University Press, 2004.
4. Massa, Ann. American Literature in Context. London and New York: Methuen & Co. Ltd., 1982.

Web resources

E.E. Cummings -in Just:

1. http://www.english.illinois.edu/maps/poets/a_f/cummings/landles10.html

PAPER - 3

INDIAN LITERATURE IN ENGLISH

OBJECTIVES:

- To help the students appreciate the richness in Indian writing in English.
- To acquaint the students to the eminent Indian writers in English

UNIT I: POETRY

(Detailed)

- | | |
|------------------------|--|
| 1. Aurobindo | : The Tiger and the Deer |
| 2. Arun Kolatkar | : From Jejury: 1. An Old Woman 2. The Butterfly |
| 3. Rabindranath Tagore | : Gitanjali (1-10) |
| 4. Kamala Das | : The Old Playhouse |

(Non-Detailed)

- | | |
|----------------------|-------------------|
| 1. Keki N. Daruvalla | : The People |
| 2. Gieve Patel | : Servants |
| 3. Adil Jusswala | : The Waiters |
| 4. Mamta Kalia | : Tribute to Papa |

UNIT II: PROSE

(Detailed)

- | | |
|-----------------------|--|
| 1. Nirad C. Chaudhuri | : Autobiography of an Unknown Indian (Book III Education) |
| 2. Ananda Coomarasamy | : Dance of Shiva |

UNIT III: DRAMA

- | | |
|-------------------|-----------------------------------|
| 1. Girish Karnad | : Hayavadana (detailed) |
| 2. Mahesh Dattani | : Dance Like a Man (Non-detailed) |

UNIT IV: SHORT STORIES (Non-Detailed)

- | | |
|---------------------|--------------------------|
| 1. R.K. Narayan | : A Horse and Two Goats |
| 2. Mulk Raj Anand | : The Gold Watch |
| 3. V.S. Naipaul | : Love, Love, Love Alone |
| 4. Shashi Deshpande | : A Wall is Safer |
| 5. Anita Desai | : Circus Cat, Alley Cat |

UNIT V: FICTION (Non-Detailed)

- | | |
|-------------------|--------------------------|
| 1. Amitav Ghosh | : The Hungry Tide |
| 2. Shashi Tharoor | : The Great Indian Novel |

BOOKS FOR STUDY AND REFERENCE

1. Karnad, Girish - Collected Plays – Vol. I. New Delhi: Oxford University Press, 2005.
2. Arvind Krishna Mehrotra, ed. - An Illustrated History of Indian Literature in English - New Delhi: Permanent Black, 2003
3. Chakraborty, Kaustav. Indian Drama in English. New Delhi: PHI Learning, 2011.
4. Prasad, Amar Nath and John Peter Joseph. Indian Writing in English. New Delhi: Sarup & Sons, 2006.

PAPER - 4

MODERN ENGLISH GRAMMAR

OBJECTIVES:

- To enable the students to acquire a high proficiency in the use of English
- To enable the students to know the dynamic and analytical aspects of the use of language.

UNIT I: WORDS AND PHRASES

WORDS

Nouns-Pronouns-Adjectives-Determiners-Verbs-Adverbs-Preposition-
Conjunctions-Interjections

PHRASES

Noun Phrases-Verb Phrases-Adjective Phrases-Adverb Phrases-Preposition
Phrases

WORD FORMATION

Acronyms- Analogy- Back formation- Blending- Borrowing- Clipping- Coining-
Compounding- Reduplication- Prefixes and suffixes

UNIT II: SENTENCES AND CLAUSES

THE SENTENCE

Major and minor sentences- Simple and multiple sentences and clauses- Sentence
types- Positive and negative sentences- Active and passive sentences

SENTENCE AND CLAUSES

Clause elements -Subject- Predicate -Verb- Object- Complement- Adverbial-
Compound and complex sentences- Independent and dependent clauses-
Coordination- Subordination- Subordinate clauses- Nominal or noun clause-
Adverbial clauses- Relative clauses- Comparative clauses- Finite and non finite
clauses- Restrictive and non restrictive clauses- Dangling modifiers- Readability

UNIT III: PUNCTUATION

Apostrophe- Brackets- Capital Letters- Colon- Comma- Dash- Ellipsis- Exclamation mark- Full stop- Hyphen -Paragraph- Question mark- Quotation marks- Semicolon- Slash

UNIT IV: FIGURES OF SPEECH AND LITERARY DEVICES

Allegory -Alliteration- Anacoluthon- Analogy- Anticlimax- Antithesis- Apostrophe- Assonance- Bathos- Catch phrases- Clerihew- Cliché- Colloquialism- Dead Metaphor- Doubles- Epigram- Euphemism- Haiku- Hyperbole- Idiom- Innuendo- Irony- Limerick- Litotes- Malapropism- Meiosis- Metaphor- Metonymy- Metre- Onomatopoeia- Oxymoron- Palindrome- Paradox- Personification- Proverb- Pun- Rhetorical question- Simile- Spoonerism- Syllepsis- Synecdoche- Zeugma.

UNIT V: COMMON ERRORS AND CONFUSIBLES

Exercises for Practice

Prescribed Text:

1. Jarvie, Gordon. Bloomsbury Grammar Guide second Edition, New Delhi. Bloomsbury. 2007

Books for Reference:

Eastwood, John. Oxford Guide to English Grammar. India: OPU, 2003.
T.J. Fitikides- Common Mistakes in English - Mumbai, orient Longman, 1997
Leech, Geoffrey, Deucher Margeret, Robert Hoogenrad. English Grammar for Today. New York: Palgrave Macmillan, 2011
Palmer, Frank – Grammar - Great Britain: Viney Ltd, 1978
Palmer, Richard. The Good Grammar Guide. London: Routledge, 2005.

ELECTIVE PAPER 1 A

INDIAN WRITING IN TRANSLATION

OBJECTIVES:

- To acquaint the students to the recent translated works from Indian languages to English.
- To appreciate the native literary richness and also to connect and critically respond to the Socio- Cultural reality of India.

UNIT I: POETRY

| | |
|---------------|---|
| Kalidasa | : Meghadutam |
| Mirabai | : I sing for him Joyfully |
| Amir Khusrau | : Colour me in Colours of Love |
| Akka Mahadevi | : 1. Sunlight Made Visible 2. Show Me Your Way Out 3. O Lord, White As Jasmine 4. How Can You Be Modest 5. Don't Despise Me |

UNIT II: PROSE

| | |
|---------------------|---|
| Meenakshi Mukherjee | : The Anxiety of Indianness Divided by a Common Language |
|---------------------|---|

UNIT III: DRAMA

| | |
|----------------------|------------------------------------|
| Bhasa | : Urubhangam (The Shattered Thigh) |
| Indira Parthasarathy | : Nandhan Kathai (Tr. C.T. Indira) |

UNIT IV: SHORT STORY

| | |
|-----------------|----------------------|
| Khushwant Singh | : A Punjab Pastorate |
| Pudumai Pithan | : The Human Machine |
| Mahaswetha Devi | : Draupadi |
| Mahim Bora | : Kathanibarighat |

UNIT V: FICTION

| | |
|-----------------------------|------------|
| U.R. Anandamurthy | : Samskara |
| Prem Chand | : Godaan |
| Thakazhi Sivasankara Pillai | : Chemmeen |

BOOKS FOR STUDY AND REFERENCE

Mukherjee, Meenakshi - The Perishable Empire - UK: Oxford University Press, 2004.

Sivasankari - Knit India Through Literature – Vol. II & III. Chennai: East West Books Pvt. Ltd, 2004.

Arvind Krishna Mehrotra, ed. - An Illustrated History of Indian Literature in English - New Delhi: Permanent Black, 2003

Kumar, Dilip. D. - Contemporary Tamil Short Fiction - Madras: Manas East West Books, 2005.

Web sources

1.Songs of Kabir Tr by Rabindranath Tagore:

<<http://www.sacred-texts.com/hin/sok/index.htm>>

Mahim Bora*Kathanibarighat*:

<https://indianreview.in/fiction/kathanibarighat-mahim-bora-assamese-short-stories-translated-lalit-saikia/>

ELECTIVE PAPER 1 B
CLASSICS IN WORLD LITERATURE

OBJECTIVES:

- To help the students imbibe classical education through translation from the rich source of cultural heritage
- To acquire the knowledge of great literary traditions due to their strong influence on British and American literature

UNIT I: POETRY

Homer : Odyssey Book XI - XII
Thiruvalluvar : Thirukkural Book – Selections

PART I VIRTUE

1.1.4. Assertion of the Strength of Virtue 31- 40

PART II WEALTH:

2.1.5 The Possession of Knowledge 421- 430

PART III. LOVE: 3.2.10. Soliloquy 1241 -50

UNIT II: POETRY

Dante : The Inferno (Canto III)
Omar Khayyam : Rubaiyat I - XXV (Tr. Edward Fitzgerald)
Kahlil Gibran : The Prophet

UNIT III: PROSE

Vyasa : Mahabharatha (retold by C.Rajagopalachari)
Valmiki : Ramayana (retold by R.K.Narayan)

UNIT IV: DRAMA

Sophocles : Oedipus Rex
Anton Chekov : The Cherry Orchard

UNIT V: FICTION

Albert Camus : The Outsider
Herman Hesse : Siddhartha

BOOKS FOR STUDY AND REFERENCE

Homer. The Odyssey, Trans. George Chapman. London: Wordsworth Classics. 2002.

Bloom, Harold. The Rubaiyat of Omar Khayyam. India: Viva Books, 2007.

Croally, Neil and Roy Hyde. Classical Literature. London: Routledge Publications, 2011.

Fischer, Carl - The Myth and Legend of Greece – Geo A, Pflaum, Publisher, Inc, 1968.

Kirk, G.S. The Nature of the Greek Myths. Great Britain: Penguin Books, 1982.

Web sources

Tirukural -<www.projectmadurai.org/pm_etexts/pdf/pm0153.pdf>

Mahabharatha (retold by C.Rajagopalachari):

<<http://www.gita-society.com/section3/mahabharata.pdf>>

ELECTIVE PAPER 1 C WOMEN'S WRITING

UNIT I: POETRY

| | |
|----------------|------------------------|
| Sylvia Plath | : Lady Lazarus |
| E.B. Browning | : A Man's Requirements |
| Maya Angelou | : Phenomenal Woman |
| Imtiaz Dharker | : Another Woman |

UNIT II: PROSE

| | |
|-------------------|--|
| Padmini Sen Gupta | : The Position of Women in Ancient India |
| Vandana Shiva | : Ecofeminism: Masculinization of the Motherland |

UNIT III: DRAMA

| | |
|-----------------|-----------------|
| Caryl Churchill | : Top Girls |
| Morsha Norman | : night' Mother |

UNIT IV: SHORT STORY

| | |
|---------------------|------------------------------|
| Joyce Carol Oates | : The White Cat |
| Flannery O'Connor | : A Good Man is Hard to Find |
| Katherine Mansfield | : The Doll House |
| C. S. Lakshmi | : A Deer in the forest |

UNIT V: FICTION

| | |
|-----------------|---------------------------|
| Arundhati Roy | : The God of Small things |
| Margaret Atwood | : Surfacing |
| Manju Kapur | : Difficult Daughters |

BOOKS FOR STUDY AND REFERENCE

Gilbert, Sandra and Susan Gubar. *The Mad Woman in the Attic: The Woman Writer and the Nineteenth Century Literary Imagination*. Yale : Yale Nota Bene, 2000.
Eagleton, Mary Ed. *Feminist Literary Theory: A Reader*. 2nd edition. Blackwell Publishers: UK, 1994.

Jaidka, Manju. *From Slant to Straight: Recent Trends in Women's Poetry*. New Delhi: Prestige Books, 2000.

Web sources

Encycolpedia of Feminist Literary Theory:

<http://www.tandfebooks.com.iproxy.inflibnet.ac.in:2048/action/showBook?doi=10.4324/97802038744>

SEMESTER II

PAPER – 5

RESTORATION AND EIGHTEENTH CENTURY LITERATURE

OBJECTIVE:

- To survey the emergence of new models of poetry and drama in this period of high ideals combined with wit and language
- To study the broadening of the literary civilization that included more of the middle class.

UNIT – I: POETRY (Detailed)

John Milton : Paradise Lost Book IX (Lines 48 – 191)
The Sun was sunk, and after him the Starr ...
Disturbd not, waiting close th' approach of
Morn.

Andrew Marvell : To His Coy Mistress

POETRY (Non-detailed)

Alexander Pope : The Essay On Man: Epistle II (II. 1 - 92)
("Know then thyself....Our greatest evil or great
good")

William Cowper : The Castaway

UNIT II – PROSE (Detailed)

Jonathan Swift : The Battle of the Books (Para 10 – 14)
(Things were at this crisis, when a material accident
fell out... thus furnishing man-kind with the two
noblest of things, which are sweetness and light.)

PROSE (Non-detailed)

Addison and Steele : The Coverley Papers:
1. Sir Roger at the Theatre
2. Sir Roger at Home

UNIT – III: DRAMA (Detailed)

John Dryden : All for Love

UNIT – IV: DRAMA (Non-detailed)

Richard Sheridan : The School for Scandal

Congreve : The Way of the World

UNIT – V: FICTION(Non-detailed)

Daniel Defoe : Robinson Crusoe

Henry Fielding : Tom Jones

BOOKS FOR STUDY AND REFERENCE

Sanders, Andrews. English Literature. India: OUP, 2011.

Tillyard, E.M. Milton. London: Chatto&Windus Ltd, 1966.

Clifford L., James. Ed. Eighteenth Century English Literature. London: OUP, 1977.

Dobree, Bonamy and Wilson F. P. ed. English Literature. London: OUP, 1963.

PAPER – 6

THE ROMANTIC REVIVAL LITERATURE

OBJECTIVES:

- To provide an overview of the transformation of the literary climate where the romantic sensibility finds an authentic voice, touch and intensity.
- To enable the students to appreciate the reformed literary style of the representative writers of the period.

UNIT – I: POETRY (Detailed)

| | |
|--------------------|------------------------|
| William Wordsworth | : Immortality ode |
| S.T. Coleridge | : Kubla Khan |
| P.B. Shelley | : Ode to the West Wind |
| John Keats | : Ode to a Nightingale |

UNIT – II: POETRY (Non-detailed)

| | |
|----------------|--------------------------|
| William Morris | : Haystack in the Floods |
| Lord Byron | : Don Juan - Canto X |

UNIT – III: PROSE (Detailed)

| | |
|--------------|--|
| Charles Lamb | : From Essays of Elia: 1.Dream Children: A Reverie 2.Old China |
| Hazlitt | : My First Acquaintance with Poets |

UNIT – IV: DRAMA (Non-detailed)

| | |
|---------|----------------------|
| Shelley | : Prometheus Unbound |
|---------|----------------------|

UNIT – V: FICTION (Non-detailed)

| | |
|------------------|--------------------|
| Walter Scott | : Kenilworth |
| Charlotte Bronte | : Jane Eyre |
| Jane Austen | : Northanger Abbey |

BOOKS FOR STUDY AND REFERENCE

Raymond Wilson Ed., *A Coleridge Selection*. London: Macmillan Ltd., 1988.
Edmund Blunden Ed., *The Poems of John Keats*. New Delhi: Rupa Publication, 2000.
Geoffrey Durant *William Wordsworth* — Cambridge: Cambridge University Press, 1969.
Kelvin Everest, *John Keats* — New Delhi: Atlantic Publication, 2002.

PAPER – 7

LANGUAGE AND LINGUISTICS

OBJECTIVES:

- To enhance the basic knowledge of the structure of English and the theoretical background to phonetics and English Phonology.
- To introduce the students to basic concepts in morphology, syntax, semantics and pragmatics.
- To equip the students with the knowledge of applications of linguistics.

UNIT – I: THE HISTORY OF ENGLISH LANGUAGE

The descent of English language; Old English Period; Middle English; Renaissance & After; Growth of Vocabulary; Change of Meaning; Evolution of Standard English.

From Wood F.T. *An Outline History of the English Language*. Madras.Macmillan, 2001

UNIT – II: PHONOLOGY

Air stream mechanisms - The organs of speech – Classification and description of sounds, Cardinal Vowels, English Vowels, Diphthongs and Consonants, Transcription, Syllable

UNIT – III: PHONOLOGY

Accent, Rhythm and Intonation, Assimilation, Elision, Liaison and Juncture, Phonetic transcription of dialogues

Connor, J.D.O.', *Better English Pronunciation*. Cambridge : Cambridge University Press, 1980.

Balasubramanian – A Textbook of English Phonetics for Indian Students. Madras Macmillan, 1993.

UNIT – IV: LEVELS OF LINGUISTIC ANALYSIS

Morphology, Phrases Sentence, Grammar, phrases, semantics, Pragmatics, Discourse Analysis

From Geroge Yule.*The Study of Language* Second Edition Cambridge University Press, 1996

UNIT – V

(A) Sociolinguistics

Language varieties, language, society and culture

From George Yule. *The Study of Language* Second Ed. CUP, 1996)

(B) TG Grammar - IC Analysis

From Grammar 3rd edition by Frank Palmer. Penguin

(C) Applications of Linguistics

Verma and Krishnaswamy :Modern Linguistics (Units 42 – 45).

BOOKS FOR STUDY AND REFERENCE

Connor, J.D.O.', *Better English Pronunciation*. Cambridge : Cambridge University Press, 1980.

Wood F.T., *An Outline History of the English Language*. Madras : Macmillan, 2001

Balasubramanian – A textbook of English Phonetics for Indian Students – Madras Macmillan, 1993.

Finch, Geoffrey – *Language and Linguistics: An Introduction* – Macmillan, 2000

Jones, Daniel – *The Pronunciation of English* – New Delhi: Universal Book Stall & Cambridge University Press, 1992.

Krishnaswamy N., S.K. Verma – *Modern Linguistics* – New Delhi: Oxford University Press, 1989.

Yule, George. *The Study of Language*. Cambridge University Press, 1985.

Web sources

The History of Teaching English as a Foreign Language, from a British and European Perspective A. P. R. Howatt & Richard Smith

<http://www.tandfonline.com/doi/pdf/10.1179/1759753614Z.00000000028?needAccess=true>

PAPER – 8

LITERARY CRITICISM

OBJECTIVES:

- To examine the representative texts of the seminal literary critics to understand intrinsic and extrinsic criticism.
- To expose the students to the concepts of the historical perceptions over the centuries.

UNIT – I

Introduction to Classical Literary Criticism- Plato, Aristotle, Horace and Longinus
From Nagarajan M.S. – English Literary Criticism and Theory – Hyderabad: Orient
Longman, 2006

UNIT – II

| | |
|----------------|---|
| Bharatamuni | : From Natya and Rasa – Aesthetics of Dramatic Experience |
| Anandavardhana | : Dhvani: Structure of Poetic Meaning from the Dhvanyloka |

From Indian Literary Criticism: Theory and Interpretation ed. G.N. Devy, Orient
Longman, Hyderabad.

UNIT – III

| | |
|----------------|--|
| Wordsworth | : Preface to the Lyrical Ballads (Selection) |
| Alexander Pope | : An Essay on Criticism – lines 233 -415 |
| | (A perfect Judge will read each work...That in proud dullness joins with Quality) |

UNIT – IV

| | |
|----------------|-----------------------------|
| Mathew Arnold | : The Study of Poetry |
| D.H. Lawrence | : Why the Novel Matters |
| William Empson | : Seventh Type of Ambiguity |

UNIT-V

| | |
|----------------|----------------------------|
| Northrop Frye | : Archetypes of Literature |
| Roland Barthes | : The Death of the Author |

BOOKS FOR STUDY AND REFERENCE

Nagarajan M.S. – English Literary Criticism and Theory – Hyderabad: Orient Longman, 2006

Das and Kumar, Bijay - Twentieth Century Literary Criticism -Atlantic Publishers,

Habib, M. A. R. *A History of Literary Criticism*. Black Publishing, USA. 2006

... *Modern Literary Criticism and Theory*. Blackwell Publishing, New Delhi. 2008.

Lodge, David, ed. *Modern Criticism and Theory* - II edition, New Delhi: Pearson Education, 1998.

Ramaswami and Seturaman V.S. ed. - *The English Critical Tradition: An Anthology of English Literary Criticism: Vol. 1.* - Macmillan, 1986.

Seturaman, ed. – *Indian Aesthetics: An Introduction*-New Delhi: Macmillan, 2005

ELECTIVE PAPER 2 A
INDIAN DIASPORA LITERATURE

OBJECTIVES:

- To acquaint students with a knowledge of Indian Diaspora writers and their works.
- To help the students have a broad outlook on diaspora literature and to make them understand and estimate the diverse paths, the Indian culture has taken in the era of multiculturalism.

UNIT I: POETRY

| | |
|------------------|---|
| Sujata Bhatt | : A Different History |
| R. Parthasarathy | : Exile, Trial, Homecoming |
| A. K. Ramanujan | : Relations: Of Mothers, Love Poem for a Wife, Farewells |
| Meena Alexander | : I Root My Name |

UNIT II: DRAMA

| | |
|---------------------|-----------|
| Manjula Padmanabhan | : Harvest |
|---------------------|-----------|

UNIT III: ESSAY

| | |
|----------------|----------------------------------|
| Amitav Ghosh | : The Diaspora in Indian Culture |
| Salman Rushdie | : Imaginary Homelands |

UNIT IV: SHORT STORY

| | |
|----------------------|---------------------------|
| V.S.Naipaul | : The Enemy |
| Jhumpa Lahiri | : Interpreter of Maladies |
| Amit Chaudhuri | : Portrait of an Artist |
| Shauna Singh Baldwin | : English Lessons |

UNIT V: FICTION

| | |
|--------------------|----------------------------|
| Kiran Desai | : The Inheritance of Loss |
| Gita Hariharan | : The Ghosts of Vasumaster |
| Bharathi Mukherjee | : Jasmine |

BOOKS FOR STUDY AND REFERENCE

Bandyopadhyay, Pranab, ed. - Women Poets of India: An Anthology of Indian Poetry - Calcutta: United Writers, 1977.

Batra, Shakti - Modern Indian Literature: Poems and Short Stories: A Critical Study - Delhi: Surjeet Publications, 2006.

De Souza, Eunice, ed. - Nine Indian Women Poets: An Anthology – New Delhi: Oxford University Press, 1997.

King, Bruce - Modern Indian Poetry in English – New Delhi: Oxford University Press, 1987.

Kurup P.K.J. - Contemporary Indian Poetry in English - New Delhi: Atlantic Publishers, 1991.

Arvind Krishna Mehrotra, ed. - An Illustrated History of Indian Literature in English - New Delhi: Permanent Black, 2003..

M.C. Leod A.L.- Commonwealth and American Women's Discourse: Essays in Criticism - New Delhi: Sterling Publishers, 1996.

Mukherjee, Bharati - Indian English Novelists: An Anthology of Critical Essays.

Peeradina, Saleem - Contemporary Indian Poetry in English

Rao Ramakrishna, Adapa and Sivaram Krishna M. - When East meets West: Indian Thought in Anglo Indian and Indo English Fiction

Balachandran, Dr.K-critical Essays on Diasporic Writings-Arise Publishers & Distributors, 2008.

ELECTIVE PAPER 2 B

ELECTIVE IIB: POSTCOLONIAL STUDIES

OBJECTIVES:

- To introduce the political and socio-cultural discourse of the developing countries through the study of key authors and poets who cherished the native culture.
- To trace the historical contents laying emphasis on the development of post-colonial literatures and theory.

UNIT I: POETRY

- | | |
|------------------|---------------------------|
| 1. P.K. Page | : Autumn |
| 2. David Rubadri | : An African Thunderstorm |
| 3. Derek Walcott | : The Fortunate Traveller |
| 4. Gabriel Okara | : The Mystic Drum |
| 5. J.P. Clark | : The Casualties |

UNIT II: DRAMA

- | | |
|-------------------|-----------------------|
| 1. Athol Fugard | : Sizwe Bansi is Dead |
| 2. Gurucharan Das | : Larins Sahib |

UNIT III: PROSE I

- | | |
|---|---|
| 1. Meenaksi Mukherjee | : Interrogating Post Colonialism |
| 2. Bill Ashcroft, Gareth Griffiths and Helen Tiffin | : The Empire Writes Back (Introduction) |

UNIT IV: PROSE II

- | | |
|----------------------|---|
| 1. Homi K. Bhabha | : The Location of Culture |
| 2. Ngugi wa Thiong'O | : From Decolonising the mind I was born ...in the lives of Kenyan children |

UNIT V: FICTION

- | | |
|---------------------|-----------------------|
| 1. Salman Rushdie | : Midnight's Children |
| 2. Monica Ali | : Brick Lane |
| 3. Michael Ondaatje | : The English Patient |
| 4. Caryl Phillips | : Crossing the River |

BOOKS FOR STUDY AND REFERENCE

Das, Gurucharan. Three English Plays. New Delhi: Oxford University Press, 2001.

Ashcroft, Bill. Gareth Griffiths and Helen Tiffin. The Empire Writes Back. London: Methuen, 1987.

Bhabha, Homi K. The Location of Culture: New York: Routledge 2012.

Contemporary Indian Poetry in English: Ed. By Saleem Peeradina

Ashcroft, Bill, Gareth Griffiths and Helen Tiffin - The Empire Writes Back - London and New York: Routledge, 1989.

Narasimiah C.D. Anthology of Commonwealth Poetry. Macmillan

Abraham, Taisha. Introducing Postcolonial Theories. New Delhi: Macmillan Publishers India, 2007.

King, Bruce - New National and Postcolonial Literatures - Clarendon Paperbacks.

Nasta, Susheila. Writing Across Worlds. London: Routledge Taylor & Francis Group, 2004.

Patke, Rajeev S. Postcolonial Poetry in English. New Delhi: OUP, 2006.

Sarangi, Jaydeep and Binod Mishra. Explorations in Australian Literature. India: Sarup & Sons, 2006

ELECTIVE PAPER 2 C

ELECTIVE IIC: NEW LITERATURES IN ENGLISH

OBJECTIVES:

To introduce to the students the New Literatures apart from the 'traditional' English literature and instill a critical reflection of the colonial experience.

To acquaint students to the literatures introduced in the second half of the twentieth - century and to analyse the characteristics of self-constituted identity and independence in the aftermath of colonialism.

UNIT-I: POETRY

- | | |
|------------------|------------------------------|
| 1. Pablo Neruda | : Fully Empowered |
| 2. A.D.Hope | : Lamp |
| 3. F.R.Scott | : The Canadian Authors' Meet |
| 4. Judith Wright | : Woman to Man |

UNIT-II: PROSE

- | | |
|------------------|---|
| 1. Frantz Fanon | : The wretched of the earth: Reciprocal Bases of National Culture and the Fight for Freedom |
| 2. Milan Kundera | : The Art of the Novel- The Depricated Legacy of the Cervantes (Yet I think.....one is outraged.) |

UNIT-III: DRAMA

- | | |
|--------------------|-----------------------|
| Lorraine Hansberry | : A Raisin in the Sun |
|--------------------|-----------------------|

UNIT-IV: SHORT STORIES

- | | |
|--------------------------|------------------------------------|
| 1. Jorge Luis Borges | : Death and the Compass |
| 2. Carlos Fuentes | : The Doll Queen |
| 3. Octavio Paz | : The Blue Bouquet |
| 4. Gabriel Garca Marquez | : Balthazar's Marvellous Afternoon |

UNIT - V: FICTION

- | | |
|-----------------------------|--------------------------------|
| 1. Amy Tan | : The Joy Luck Club |
| 2. Nayomi Munaweera | : Island of a Thousand Mirrors |
| 3. Chimamanda Ngozi Adichie | : Half of a Yellow Sun |
| 4. Yann Martel | : Life of Pi |
| 5. Orhan Pamuk | : My Name is Red |

BOOKS FOR STUDY AND REFERENCE

Kundra, Milan. *The Art of the Novel*. New York: Penguin Books & Faber & Faber, 1986.

Habib M.A.R. *Literary criticism from Plato to the Present. An Introduction*". U.K. Wiley – Blackwell Publication, 2011.

Ryan, Michael. *Literary Theory: A Practical Introduction*. Australia: Blackwell Publishing, 2007.

Wyrick, Deborah. *Fanon for Beginners*. India: Orient. Black Swan, 2008.

Tandon, Neeru; Edt. *Feminine psyche: A Post – Modern Critique*. New Delhi: Atlantic Publishers, 2008.

Lennard, John. *The Poetry Handbook*. New York: Oxford, 2005.

Web sources

Frantz Fanon <https://www.marxists.org/subject/africa/fanon/national-culture.htm>

SEMESTER III
PAPER - 9
SHAKESPEARE STUDIES

OBJECTIVES:

- To enable the students to read the plays in the light of the critical approaches that has emerged prominent.
- To study the plays of Shakespeare in the critical, textual, and theatrical contexts.

UNIT – I: A Midsummer Night's Dream (Detailed)

UNIT – II: Hamlet (Detailed)

UNIT – III: Henry IV Part I (Non-Detailed)

UNIT – IV: Antony and Cleopatra (Non-Detailed)

UNIT – V: Critical Interpretations of Shakespeare's Plays (Non-Detailed)

Structuralism : Roland Barthes – Mythic Signs in Mankiewicz's *Julius Caesar*

Psycholoanalysis : Ernest Jones – Reading the Oedipus Complex in *Hamlet*

Marxism : Karl Marx – *Timon of Athens* and the Power of Money

Feminism : Virginia Woolf - Shakespeare and the Question of Female
Authorship

Postcolonial Theory : Wole Soyinka – Antony and Cleopatra by Shakespeare

From Jonathan Gil Harris, *Shakespeare and Theory*. New York: Oxford University Press, 2012.

BOOKS FOR STUDY AND REFERENCE

Dover Wilson, *What Happens in Hamlet*. London: Cambridge University, 1974.

Jonathan Gil Harris, *Shakespeare and Theory*. New York: Oxford University Press, 2012.

Ania Loomba, *Shakespeare, Race and Colonization*. New York: Oxford University Press 2012.

John Russell Prown, *Shakespeare's Antony and Cleopatra*. London: Macmillan Press Ltd., 1977.

Diana Henderson Ed. *Alternative Shakespeare 3*. Oxford: Routledge Abington, 2008.

A.C. Bradley, *Shakespeare Tragedy*. New Delhi: Atlantic Publishers and Distributors Pvt. Ltd., 2010.

Robin Lee, *Shakespeare's Antony and Cleopatra – Studies in English Literature*. London: Edward Arnold, 1984.

PAPER -10

THE VICTORIAN LITERATURE

OBJECTIVES:

- To study Victorian Literature in the background of the changing views, improvements in technology and the poor conditions of the working class people.
- To analyse Victorian literature as an art that encouraged higher good as righteous and instilled social consciousness.

UNIT – I: POETRY (Detailed)

| | |
|--------------------|-------------------|
| 1. Mathew Arnold | : Dover Beach |
| 2. Alfred Tennyson | : Tithonus |
| 3. Robert Browning | : My Last Duchess |
| 4. G.M.Hopkins | : The Wind Hover |

(Non-Detailed)

| | |
|-----------------------|--|
| 1. Christina Rossetti | : Goblin Market |
| 2. E. B. Browning | : Sonnet from the Portuguese: No 14: If thou must love me |

UNIT – II: PROSE (Detailed)

| | |
|----------------|---|
| Thomas Carlyle | : Hero and Hero Worship: Hero as a Poet |
|----------------|---|

UNIT – III: DRAMA (Detailed)

| | |
|-------------|-----------------------------------|
| Oscar Wilde | : The Importance of Being Earnest |
|-------------|-----------------------------------|

UNIT – IV: FICTION (Non-Detailed)

| | |
|-----------------|----------------------------|
| 1. George Eliot | : The Mill on the Floss |
| 2. Thomas Hardy | : Tess of the D'ubervilles |

UNIT – V: FICTION (Non-Detailed)

| | |
|--------------------|-------------------------|
| 1. Charles Dickens | : David Copperfield |
| 2. Horace Walpole | : The Castle of Otronto |

BOOKS FOR STUDY AND REFERENCE

1. Charles Lamb, *Essays of Elia*. Bombay: Macmillan, 1895.
2. Charles Dickens, *Oliver Twist*. London: Thomas Nelson & Son Ltd, 1958.
1. *Critical Essays on the poetry of Tennyson*, Ed by John Killham, Routledge & Kegan Paul. London: 1960.
2. Geoffrey H. Hartman, *Hopkins: A Collection of Critical Essays*, Ed by. New Delhi: Prentice-Hall of India Pvt Ltd., 1980.
3. Andrew H. Wright, *Jane Austen's Novels*. A Peregrine Book, Middlesex: Penguin Books Ltd., 1953.
4. Rod Mengham, *Charles Dickens*. New Delhi: Atlantic Publishers, 2001.
5. R.T. Jones, *British Authors, Introductory Critical Studies, George Eliot*. London: Cambridge University Press, 1970.
6. Lance St. John Butler, *Studying Thomas Hardy*. Essex: Longman York Press – 1986.

PAPER – 11

CONTEMPORARY LITERARY THEORY - I

OBJECTIVES:

- To help the students understand literary theory as a system to critically interpret literary texts.
- To enable the students to understand the broad spectrum of thought that is covered by literary theory and also to enhance their literary research.

UNIT I: Introduction

Literary theorising from Aristotle to Leavis - The transition to 'theory' - recurrent ideas in critical theory

Structuralism Structuralism Critical Terms: Signifier, Signified, Langue, Parole, Semiotics.

The scope of structuralism - Structuralist criticism: examples

Unit II: Stylistics

Rhetoric to philology - The ambitions of Stylistics - Stylistics: examples

Narratology

Telling stories – Aristotle – Vladimir Propp – Gerard Genette - – Narratology: an example

UNIT III: Post structuralism and deconstruction

Post structuralism and deconstruction: Decentring, Aporia, Difference, Impasse, Binary Opposition.

Theoretical differences between Structuralism and Post-structuralism

Post-structuralism - life on a decentred planet - Structuralism and post-structuralism- practical differences - Deconstruction: an example

UNIT IV: Psychoanalytic criticism

Psychoanalysis Critical Terms: Unconscious, Repression, Sublimation, Ego, Super-ego, Id, Oedipus Complex, Libido, Phallic, Eros, Thanato, Transference, Projection, Defence Mechanism, Screen Memory, Parapraxis, Displacement, Condensation.

Introduction - How Freudian interpretation works - Freud and evidence

Freudian psychoanalytic criticism: examples

Lacan - Lacanian criticism: an example

UNIT V: Feminist Criticism

Feminism Critical Terms: Feminist, Female, Feminine, Gynocriticism, Chora.

Feminism and feminist criticism - Feminist criticism and the role of theory

Feminist criticism: an example

Prescribed Text

Barry, Peter. *Beginning Theory*. Manchester and New York: Manchester University Press, 2002.

BOOKS FOR STUDY AND REFERENCE

Hawkes, Terence. *Structuralism and Semiotics*. London and New York: Routledge, 1977.

Holquist, Michael. *Dialogism*. London and New York: Routledge, 1990.

Allen, Graham. *Roland Barthes*. London and New York: Routledge, 2003.

Belsey, Catherine. *Critical Practice*. London and New York: Routledge, 1980.

Bennett, Tony. *Formalism and Marxism*. London and New York: Routledge, 1979.

Bertens, Hans. *Literary Theory: the Basics*. London: Routledge, 2001.

Culler, Jonathan Barthes. *A Very Short Introduction*. New York: OUP, 2002.

Fillingham, Lydia Alix and Moushe Susser. *Foucault for Beginners*. India: Orient Longman, 2000.

Iyengar, Srinivasa K.R. *The Adventure of Criticism*. New Delhi: Sterling Publishers, 1985.

Krishnaswamy N. John Varghese and Sunita Mishra. *Contemporary literary Theory: A Student's Companion*. New Delhi: Macmillan, 2001

Hawthorn, Jeremy. *A Glossary of Contemporary Literary Theory*. Fourth Edition. UK. Hodder Education, 2000.

PAPER – 12

RESEARCH METHODOLOGY

OBJECTIVES:

- To facilitate students to gain knowledge to pursue research.
- To enable students to present the research findings through the application of systematic and scientific methods.

Unit I

Selecting a Topic - Compiling a Working Bibliography –Evaluating Sources

Unit II

Taking Notes – Outlining – Writing Drafts – Language and Style -Plagiarism

Unit III

The Mechanics of Writing -The Format of Research Paper –Documentation

Unit IV

Documentation: Citing sources in the text: Parenthetical Documentation and the List of Works Cited

Unit V

Abbreviations: Common Scholarly Abbreviations and Reference words – Symbols and Abbreviations Used in Proofreading and correction –Common Correction Symbols and Abbreviations – Titles of works

Prescribed Text

Gibaldi, Joseph - *M.L.A: Handbook for Writers of Research Papers, 7th Edition* . New Delhi: Affiliated East-West Press Pvt. Ltd., 2003.

Essential reading:

W.R.Owens - Planning , Writing and Presenting a dissertation or Thesis

From DaSousa, Delia Correa and W.R.Owens. *The Handbook to Literary Research*, second Edition. Routledge: Taylor and Francis Group, The Open University Abingdon-Oxon. 2010.

Gabriele Griffin – Research Skills, Methods, and Methodologies (Pg 5 - 7)

From Gabriele Griffin. *Research Methods for English Studies: An Introduction*. UK: Edinburgh University Press, 2005.

BOOKS FOR STUDY AND REFERENCE

- George. Watson. *Writing a Thesis: A Guide to Long Essays and Dissertations*. London and New York: Longman, 1987.
- Gabriele Griffin. *Research Methods for English Studies: An Introduction*. UK: Edinburgh University Press, 2005.
- DaSousa, Delia Correa and W.R.Owens. *The Handbook to Literary Research*, second Edition. Routledge: Taylor and Francis Group, The Open University Abingdon-Oxon. 2010.
- Anderson, Janathan, Berry H. Durston and Millicent Poole. *Thesis and Assignment Writing*. New York: Wiley Eastern Limited, 1988.
- Kumar, Anand Raju. *American British and Commonwealth*. Chennai: Affiliated East-West Press Ltd, 1990.
- Eliot Simon ed. *A Hand Book to Literary Research*. London: Routledge, 1998.
- Fabb Nigel and Durant Allan. *How to Write Essays Theses Dissertations in Literary Studies*. London: Longman Publishing, 1993.
- Goring Paul. *Studying Literature: The Essential Companion*. UK: Hodder education, 2001.

ELECTIVE PAPER 3 A

HISTORY OF IDEAS

OBJECTIVES:

- To encourages scholarship at the intersection of cultural and intellectual histories of philosophy, of literature and the arts, of the natural and social sciences, of religion, and of political thought.
- To encourage diverse methodological approaches in critical interpretation

UNIT I: ANCIENT

Plato : Republic – 2
Aristotle : On Poetics – Description of Tragedy

UNIT II:

MEDIEVAL

St. Augustine : Confessions –Ch X

SEVENTEENTH CENTURY

John Locke : An Essay Concerning Human Understanding- Introduction

UNIT III: EIGHTEENTH CENTURY

Rousseau : The Social Contract or Principles of Political Right – Book I

Mary Wollstonecraft : A Vindication of the Rights of Woman with Strictures on
Political and Moral Subjects

UNIT IV: NINETEENTH CENTURY

Darwin : Survival of the Fittest (Chapter IV)

Marx : The Communist Manifesto – Chapter II

UNIT V: TWENTIETH CENTURY

Sigmund Freud : The Structure of the Unconscious

Simone de Beauvoir : The Second Sex-Introduction

S. Radhakrishnan : Introduction to the Principal *Upanishads*

BOOKS FOR STUDY AND REFERENCE

Annas, Julia. *Plato, A Very Short Introduction*. New Delhi: Oxford University Press, 2006.

Shields, Christopher. *Aristotle*. Oxon: Routledge, 2007.

Lewens, Tim. *Darwin*. Oxon: Routledge, 2007.

Darwin, Charles. *The Origin of Species*. New Delhi: Peacock Books, 2012.

Dent, Nicholas. *Rousseau*. Oxon: Routledge, 2005.

Stevensen, Leslie & David L. Haberman. *Ten Theories of Human Nature*. Fourth Edition. New Delhi: Oxford University Press, 2006.

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ELECTIVE PAPER 3 B

LITERATURE: ANALYSIS, APPROACHES AND APPLICATIONS

OBJECTIVES:

- To develop the reading and writing skills of the students for professional and academic purposes.
- To enhance the interpretation skills of the students to critically analyse and appreciate literary texts.

UNIT I **Practical Criticism**

Literary Analysis: Interpretation of passages of prose and poetry. Such questions may involve recognition of conventions and genres, allusions and references, meaning and tone, grammatical structures and rhetorical strategies, and literary techniques.

Reference: Stephen, Martin. *English literature*. New York: Longman, 1986.

V.S.Seturaman,C.T.Indira, T.Sriraman. Practical criticism. India, Macmillan.1999.

UNIT II **(a) Book Publication**

ISBN – The International Standard Book Number

ISSN – The International Standard Serial Number

Foreword – Preface

(b) Copy editing

Introduction to copy- editing- making the typescript - Copyright
Permission and acknowledgement- making corrections- House Style-
Abbreviation - Bias and Parochialism – Capitalization - Cross- References -
Dates and Time- Italic - Proper Names – Punctuation – Spelling -
Miscellaneous Points - Preliminary Pages

From Butcher,Judith, Drake Caroline, and Leach ,Maurice. *Butcher's Copy-editing: The Cambridge Handbook for Editors,Copy-editorsand Proof readers*.

UNIT III **Journalism and Mass Communication**

Report Writing, Book Review, Film Review and Proofreading

Reference: Mukhopadhyay, Lina *et al. Polyskills: A Course in*

Communication Skills and Life Skills. Chennai and New Delhi: Foundation Books CUP, 2012.

UNIT IV Technical Writing

User's Manual, Technical Letters, Flow Charts, Tablets, Writing Instruction

Reference: Pauley, Steven E. and Daniel, G.Riordan. *Technical Report Writing*. New Delhi: A.I.T.B.S. Publishers and Distributors, 2006.

UNIT V Theoretical Approaches to Literature

1. Text-Oriented Approaches

Philology- Rhetoric and Stylistics - Formalism and Structuralism

New Criticism- Semiotics and Deconstruction

2. Author-Oriented Approaches

3. Reader-Oriented Approaches

4. Context-Oriented Approaches - New historicism - Feminist literary theory and gender theory

5. Literary Critique or Evaluation

From Theoretical Approaches - Klarer, Mario. *An Introduction to Literary Studies*. Theoretical Approaches to Literature (pg71-96)

BOOKS FOR STUDY AND REFERENCE

Butcher, Judith, Drake Caroline, And Leach ,Maurice. *Butcher's Copy-editing: The Cambridge Handbook for Editors, Copy-editors and Proof readers*. Fourth Edition Cambridge University Press, 2007

Stephen, Martin. *English literature*. New York: Longman, 1986.

Klarer, Mario. *An Introduction to Literary Studies*. London: Routledge, 2004.

Leech, Geoffrey, Margaret Deuchar and Robert Hoogenraad. *English Grammar for Today*. New York: Palgrave Macmillan, 2011.

Gerson, Sharon. J. and Steven M. Gerson. *Technical Writing: Process and Product* - III edition. New Delhi: Pearson Education Inc., 2005.

Pauley, Steven E. and Daniel, G.Riordan. *Technical Report Writing*. New Delhi: A.I.T.B.S. Publishers and Distributors, 2006.

ELECTIVE PAPER 3 C TRANSLATION STUDIES

OBJECTIVES:

- To help the students understand how translation shapes the knowledge of the world in the past and better equips to shape the future
- To understand better the emphasis in cultural aspects and the context within which translation occurs

UNIT I: CENTRAL ISSUES

Language and Culture – Types of Translation – Decoding and Recoding – Problems of Equivalence – Loss and Gain – Untranslatability

From Bassnett, Susan - *Translation Studies*, 3rd Edition – Routledge, New Delhi, 2005.

UNIT II: HISTORY OF TRANSLATION – THEORY I

Problems of “Period Study” – Bible Translation – Education and the Vernacular – Early Theorists – Archaizing

From Bassnett, Susan - *Translation Studies*, 3rd Edition – Routledge, New Delhi, 2005.

UNIT III: HISTORY OF TRANSLATION – THEORY II

The Renaissance – The Seventeenth and the Eighteenth Century – Romanticism and Post Romanticism – The Victorian – The Twentieth Century

From Bassnett, Susan - *Translation Studies*, 3rd Edition – Routledge, New Delhi, 2005.

UNIT IV: COMPARATIVE STUDY OF TRANSLATION

A.K. Ramanujan : On Translating a Tamil Poem

A.K. Ramanujan : Three Hundred Ramayanas: Five Examples
and Three Thoughts on Translation

From Dharwadker, Vinay (Ed). *The Collected Essays of A.K. Ramanujan*. New Delhi: Oxford University Press, 2004.

UNIT V: TRANSLATION IN PRACTICE

A field work on any one of the topics given below has to be undertaken by the students to attempt a translation of the same for **internal assessment**.

- Oral stories, songs and traditions of the village
- History of the local or town temple or masque or churches- worship places.
- History of the monuments in the village or town
- Family History
- Life of the ancestors in the village or town
- The origin of the name of the village /town
- Great personalities of the past and present who lived in the village/town
- Extraordinary Historical event.
- The development of the village or town
- The description of special occupation of the village or town
- Typical village festival, its origin and the celebrations.
- The natural treatment and cure of the diseases.
- The Landscape, details of the source of water.
- Food habits of the village or town.
- Inscriptions

BOOKS FOR STUDY AND REFERENCE

Bassnett, Susan and Harish, Trivedi. *Post-Colonial Translation: Theory Practice*. London and New York: Routledge, 1999.

Kumar, Bijay Das. *A Handbook of Translation Studies*. New Delhi: Atlantic Publishers and Distributors, 2005.

Seturaman, ed. *Indian Aesthetics: An Introduction*. New Delhi: Macmillan, 2005.

Mukherjee Sujit. *Translation as Recovery*. Delhi: Pencraft International.

SEMESTER IV

PAPER –13 TWENTIETH CENTURY LITERATURE

OBJECTIVES:

- To help the students to retrace the diversity of the literary schools of this period which were more liberal in outlook and scientific in technique
- To introduce students to the thoroughly competent and literate authors in the traditional mode, who were creatively original

UNIT – I: POETRY (Detailed)

- | | |
|-----------------|--------------------------|
| 1. W. B .Yeats | : Easter 1916 |
| 2. T. S Eliot | : The Wasteland |
| 3. Wilfred Owen | : Anthem of Doomed Youth |

POETRY (Non - Detailed)

- | | |
|--------------------|--------------------------------|
| 1. Seamus Heaney | : Digging |
| 2. Thom Gunn | : On the Move |
| 3. Stephen Spender | : The Labourer in the Vineyard |
| 4. Ted Hughes | : Crow Alights |

UNIT – II: PROSE (Detailed)

- | | |
|-----------------|------------------|
| 1. E.M. Forster | : What I Believe |
| 2. C. P. Snow | : Two Cultures |

UNIT – III: DRAMA (Detailed)

| | |
|---------|---------------------|
| Beckett | : Waiting For Godot |
|---------|---------------------|

(Non-Detailed)

| | |
|---------------|----------------------|
| Harold Pinter | : The Birthday Party |
|---------------|----------------------|

UNIT – IV: SHORT STORY

- | | |
|---------------------------|--|
| 1. James Joyce | : After the Race |
| 2. Joseph Conrad | : The Secret Sharer |
| 3. Sir Arthur Conan Doyle | : A Scandal in Bohemia |
| 4. Margaret Drabble | : A Day in the Life of the Smiling Woman |

UNIT – V: FICTION

- | | |
|-------------------|---------------------------|
| 1. Graham Greene | : The Power and the Glory |
| 2. D. H. Lawrence | : Sons and Lovers |

BOOKS FOR STUDY AND REFERENCE

A.J. Wilks, *T.S. Eliot : The Waste Land Macmillan Critical Commentaries*. London: Macmillan Education Ltd, 1971.

Harold Bloom Ed, *Samuel Beckett's Waiting for Godot: Viva Modern Critical Interpretations*. New Delhi: First Indian Edition, 2007.

Morries Beja, A. E. Dyson Ed. *James Joyce : Dubliners and A portrait of the Artist as a Young man: A selection of critical essays*, 1st ed. London: The Macmillan Press Ltd, 1973.

Gamini Salgado, A. E. Dyson Ed., *D.H. Lawrence Sons and Lovers: A selection of Critical Essays*. London: The Macmillan Press Ltd, 1973.

R.D. Draper, *Sons and Lovers by D.H. Lawrence Macmillan Master Guides*. New York: Palgrave Macmillan, 1986.

PAPER – 14
ENGLISH LANGUAGE TEACHING

- To equip students to teach efficiently well at the secondary and tertiary level.
- To train them in the use of new methodologies in teaching English.

UNIT I: History of ELT

The brief history of Language Teaching

English in India – Past, Present and Future

UNIT II: Approaches and Methods

Communicative Language Teaching Method - Total Physical Response -The Silent Way

The nature of Human language – Linguistics, Psychology and English Teaching–
Methods – Approach, Method and Technique

UNIT III: Grammar and LSRW Skills

Essential Word – Grammar for teachers – Teaching of vocabulary – Essentials of English
Grammar -The Teaching of Grammar – Essentials of English speech – Teaching spoken
English: Some Techniques– Reading and Teaching of Reading -Writing and teaching of
writing and composition

UNIT IV: Teaching Literature

Teaching Prose – Teaching Poetry – Teaching Drama – Teaching Fiction

UNIT V: Teaching Tools and Assessment

Use of Blackboard and Other Instructional Aids– Study skills and reference skills - Test
and Testing– Common Errors and remedial English – Planning and lesson planning

BOOKS FOR STUDY AND REFERENCE

- Jack.C.Richards, Theodore.S.Rodgers, *Approaches and Methods in Language Teaching*. UK: Cambridge University Press, 2001.
- Martin Parrot, *Tasks for Language Teaching*. New Delhi:CUP, 1993.
- Penny Ur, *A Course in Language Teaching: Trainee Book*. UK: First Asian Edition, 1999.
- Jerry S. Gabbard and Robert Oporandy, *Language Teaching Awareness*. Chennai: OBS, 2009.
- Michael.J.Wallace, *Training Foreign Language Teachers*. New Delhi: CUP, 1991.
- Jack C. Richards and Willy A. Renandya ed., *Methodology in Language Teaching: An Anthology of Current Practice*. New Delhi: CUP, 2000.
- N. Krishnaswamy and Lalitha Krishnaswamy, *Methods of Teaching English*. Chennai: Macmillan, 2011.
- Mario Rinvoluceri, *Grammar Games: Cognitive, Affective and Drama Activities for EFL Students*. UK: CUP, 1984.
- David Nunan, *Research Methods in Language Learning*. New Delhi: CUP, 1992.
- Penny Ur, *A Course in Language Teaching: Practice and Theory*. UK: CUP, 1991.
- E. Suresh Kumar and P. Sreehari, *A Handbook for English Language Laboratories*. New Delhi: CUP India Pvt Ltd, 2007.
- A. P.R. Howatt and H. G. Widdowson, *A History of English Language Teaching*. New York: OUP, 2004.
- S. Kudchekar Ed, *Readings in English Language Teaching in India*. Chennai: Orient Black Swan, 2005.
- Penny Ur and Andrew Wright, *Five-Minute Activities: A Resource Book for Language Teachers*. New York: CUP, 1992.

PAPER – 15
CONTEMPORARY LITERARY THEORY – II

Unit I: Marxist Criticism

Marxist Critical terms: Communism, Materialist, Alienation, Reification, Over determinism, Relative Autonomy, Engelsian, Interpellation.

Beginnings and basics of Marxism - Marxist literary criticism

The Present : the influences of Althusser - Marxist criticism: an example

Unit II: New Historicism and Cultural Materialism

New Historicism Critical Terms: Parallel, Thrice-processed, Discursive.

New historicism - New and old historicisms- differences - New historicism and Foucault
- New historicism: an example

Cultural materialism - Cultural materialism: an example

Unit III: Postcolonial Criticism

Postcolonial Criticism Critical Terms: Orientalism, Adept, Adapt.

Background - Postcolonial reading - Postcolonial criticism: an Example

Ecocriticism Critical Terms: Entropy, Symbiosis.

Culture and nature - Ecocriticism: an example.

UNIT IV: Postmodernism

Postmodernism Critical Terms: Narcissism, Meta narrative, Eclectic, Aleatory, Avant-garde, Simulacrum, Simulation.

Postmodernism (pg 78 -90).

Unit V: Theory after ‘Theory’

Theory after ‘Theory’ Critical Terms: Routinise, Crisis Critique, Presentism, Aestheticism, Affective Fallacy, Congnoscere, Deviance.

Theory after ‘Theory’ (Pg 287-316)

BOOKS FOR STUDY AND REFERENCE

- Bennett, Tony. *Formalism and Marxism*. London and New York: Routledge, 1979.
- Belsey, Catherine. *Critical Practice*. London and New York: Routledge, 1980.
- Bennett, Tony. *Formalism and Marxism*. London and New York: Routledge, 1979.
- Bertens, Hans. *Literary Theory: the Basics*. London: Routledge, 2001.
- Culler, Jonathan Barthes. *A Very Short Introduction*. New York: OUP, 2002.
- Powell, Jim. *Postmodernism*. Chennai: Orient Longman, 1998
- Dobie, Ann B. *Theory into Practice: An Introduction to Literary Criticism*. New Delhi: Cengage Learning, 2012.
- Guerin Wilfred L., Earle Labour et al. *A Handbook of Critical Approaches to Literature*. New York: OUP, 1999.

PAPER – 24

RESEARCH PROJECT

Objectives:

- To provide an opportunity for the students to pursue a topic of individual interest to usher into research
- To develop in the students the ability to carry out research projects within a methodological framework through extensive personal study and individual guidance.

Preliminary Requirements:

- Knowledge of the types of Research, Deductive and Inductive Arguments, Critical Approach, Research ethics, Bibliography.
- The research work must be strictly an individual sincere work, the result of ardent study and pursuit of excellence. The work should not exceed 10,000 words and there will be viva- voce by an examiner.
- This module gives the opportunity to undertake supervised work on a dissertation in Literature or English Language Teaching up to 10,000 words, on a topic of one's choice agreed with the Guide/supervisor.
- **It is strongly recommended that the student must be motivated to begin the Preliminary reading and survey of related secondary sources for the dissertation in the first summer term and vacation holidays.**
- The students can be encouraged to present papers in the conferences and to publish in the proposed topic.

Essential Reading

a) Where And How To Find Secondary Literature

b) How to Write a Scholarly Paper

From *An Introduction to Literary Studies*- Mario Klarer Pub. London, Routledge. 2004

c) The Undergraduate Dissertation

From *In Pursuit of English Studies*. Barry, Peter. New Delhi, Bloomsbury. 2014

d) Gupta, Suman. The place of theory in literary disciplines

From DaSouza, Delia Correa and W.R.Owens. *The Handbook to Literary Research*, second Edition. Routledge: Taylor and Francis Group, The Open University Abingdon-Oxon. 2010.

Web sources

MLA 7th Edition Quick reference

sites.psu.edu/bee11/wp-content/uploads/sites/16010/.../MLA-April-2010-rev1.pdf

ELECTIVE PAPER 4 A CHILDREN'S LITERATURE

OBJECTIVES:

- To enable the students to evaluate the literary qualities and the popular appeal of Children's Literature
- To help the students to explore the category of Children's Literature and its impact on children

UNIT I: POETRY

| | |
|--------------------|-----------------------------|
| William Wordsworth | : To the Cuckoo |
| Edward Lear | : The Owl and the Pussy Cat |
| Theodore Roethke | : My Papa's Waltz |
| Coventry Patmore | : Toys |

UNIT II: PROSE

| | |
|------------------|--|
| Jawaharlal Nehru | : Letters from a Father to his Daughter: The Book of Nature |
| Shoba De | : Speed Post: 1. Circle of Love 2. Growing up is hard to do |

UNIT III: DRAMA

| | |
|--------------------|-------------------|
| Rabindranth Tagore | : The Post Office |
|--------------------|-------------------|

UNIT IV: SHORT STORY

| | |
|----------------------|--|
| Panchatantra Stories | : 1. The Greedy Cobra and the King of Frogs 2. The Story of the Potter 3. The Carpenter's Wife |
| Hans Anderson | : The Little Mermaid |
| Richard Burton | : Alibaba and the Forty Thieves |
| Ruskin Bond | : The Tiger in the Tunnel |

UNIT V: FICTION

| | |
|-----------------|--|
| C.S. Lewis | : The Tale of Narnia : The Lion, The Witch and The Wardrobe |
| Rudyard Kipling | : The Jungle Book |
| Roald Dahl | : Matilda |

BOOKS FOR STUDY AND REFERENCE

Tiwari, Shubha – Children and Literature – New Delhi: Atlantic Publishers and Distributors, 2006

Winbott S.E. – English Poetry for the Young – Blackie and Sons.

Hans Anderson – Hans Anderson Fairy Tales: India: Wilco Publishing House, 2005.

Nehru, Jawaharlal. Letter from a Father to His Daughter. India: Puffin Books, 2004.

ELECTIVE PAPER 4 B ACADEMIC WRITING

OBJECTIVES:

- To develop the reading and writing skills for personal and academic purpose.
- To enhance the interpretative ability to critically analyse and appreciate literary texts

UNIT I

Writing a Summary and Response

Writing Practice: Identifying arguments – Summarizing - Forming and expressing a point of view

Editing focus: Paraphrasing - Subject-verb agreement

UNIT II

A) Writing a Descriptive Essay

Reading: *Cherries for My Grandma* by Geoffery Canada

Writing practice: Analyzing essay organization - Writing detailed examples as support - Using a summary as an introduction

Editing focus: Adjective clauses - Habitual past: *would* vs. *used to*

B) Writing a Classification Essay

Reading: *Some Reflections on the Technology of Eating* (from *The New York Time*)

Writing practice: Determining an organizing principle for categorization - Categorizing and avoiding overlapping - Developing conclusions for classification essays

Editing focus: Pronoun referents

UNIT III

Writing an Advantages–and–Disadvantages Essay

Reading: *You’ve Got Inappropriate Mail* (from *The New York Time*)

Writing practice: Summarizing and incorporating academic research as support
Responding to a quote- More on using a summary as an introduction
Using the conclusion to unit an essay

Editing focus: Bibliographies or “Works Cited” lists - Citations for online references - Citations within a text

UNIT IV

A) Writing a Cause –and-Effect Essay

Reading: Excerpt from *The Face of Beauty* by Diane Ackerman

Writing practice: Developing different types of support - Writing up research studies
Showing cause and effect - Outlining an essay

Editing focus: Adverbial clauses - Causal connectors - Reported speech

B) Writing a Comparison-and-Contrast Essay

Reading: “A Holistic Approach to Personality Analysis. The Myers-Briggs Type Indicator”

Writing practice: Developing introductions - Assessing the value of a theory

Editing focus: Clauses for comparison, contrast and concession - Transitional expressions between sentences

UNIT V

A) Writing a Literary Analysis Essay

Reading: Excerpt from *The Kite Runner*, by Khaled Hosseini

Writing practice: Analyzing mood - Summarizing a story - Understanding plot devices
- Writing about symbols - Organizing an introduction for a literary analysis essay
Integrating quotes with text - Integrating simile, metaphor, and personification

Editing focus: Present and past unreal conditions

B) Writing an Argumentative Essay

Reading: *Students Shall Not Download. Yeah, Sure.* (from *The New York Times*)

Writing practice: Identifying arguments and counterarguments -Refuting an argument -
Organizing an argumentative essay - Synthesizing information to form arguments

Editing focus: Unstated conditionals - Noun clauses

Prescribed Text

Colonna, Mary and Gilbert, Judith. *Reason to Write*. Oxford: Oxford University Press, 2006. • Print.

BOOKS FOR STUDY AND REFERENCE

Bailey, Stephen. *Academic Writing: A Handbook for International Students*. USA and Canada: Routledge Third edition. 2011

Savage, Alice., *Effective Academic Writing: Developing Ideas* Oxford: Oxford University Press, 2012. Print.

Savage, Alice and Shafiei, Masoud. *Effective Academic Writing: The Paragraph*. Oxford: Oxford University Press, 2012. Print.

ELECTIVE PAPER 4 C

COMPREHENSIVE STUDY OF LITERATURE

OBJECTIVES:

- To test the student's level of knowledge in the chosen field of study as a whole and to evaluate their mastery.
- To ensure acquisition of a complete knowledge of the coursework and to enable the students to qualify eligibility and competitive examinations

Note for Instructors: This paper covers the entire course undergone by the student through the four semesters. There need not be a formal instruction. The faculty members of the department can offer special lectures and guidance for the preparation on the topics given. The students can be assisted with practice sessions consisting of seminars, assignments and tests.

The final examination objective type questions will cover the whole syllabus of the four semesters. The students can be internally assessed through model tests from the UGC – NET, SET and TRB. Refer to GRE tests.

Methods for study:

- Review names of important writers and their works from each literary period
- Review main characters
- Summarize plots
- Analyze significant themes and conflicts
- Review introductions to each of the following period, genres, movements and categories:
 - British Drama from *Everyman* to the Present Day
 - Twentieth-Century American Drama
 - Indian and Commonwealth Drama
 - Elizabethan and Nineteenth-Century British Fiction
 - The Twentieth-Century American Novel
 - The Indian and Commonwealth Novel
 - British poetry from Chaucer to the Romantics
 - Victorian Poetry
 - Twentieth-Century Poetry
 - Nineteenth and Twentieth-Century American Poetry
 - Commonwealth and Indian Poetry
 - Elizabethan and Nineteenth-Century British Fiction

- The Reflective Essay from Bacon to the Twentieth century
- The British Periodical Essay
- The Satirical Essay
- Literary Theory and Criticism
- Rhetoric and Prosody
- Indian Literature in Translation
- Indian Writing in English
- American and other Non-British Literatures
- European Literature From Classical Age To The 20th Century
- English as a World Language
- Characteristics of Indian English
- Teaching of Indian English at the Tertiary level

Unit I: Ideas, Periods and Movements

Identify the following genres or literary movements, with examples of important works and authors, the eras in which they flourished, the characteristic features and social or intellectual developments that may have shaped the genre or movement:

Aesthetic Movement – Augustan – Elizabethan – Enlightenment -Expressionism
 Fin de Sicele - Harlem Renaissance – Humanism – Imagism – Impressionism –
 Jacobean - Magical Realism Modernism – Naturalism – Neoclassicism –
 Neoplatonism – Platonism – Postmodernism - Pre-Raphaelitism Realism –
 Reformation – Renaissance – Restoration – Romanticism – Sentimentalism -
 Surrealism
 Symbolist movement – Transcendentalism - Victorian

Note: Unit II, III, IV- Refer to the following terms and how each operates to create meaning in literary works from specific examples of texts and authors. In general, explore a range of functions or issues.

Unit II: Poetry

Accent or beat - Accentual-Syllabic Verse - Accentual Verse – Alexandrine –
 Anapestic – Alliteration – Ballad - Stanza - Blank Verse – Caesura - Carpe Diem -
 Confessional Poetry – Dactylic - Dramatic Monologue– Eclogue – Elegy –
 Enjambment – Epic - Feminine or Double Rhyme – Foot - Free Verse - Heroic
 Couplet – Hexameter – Iambic - Internal Rhyme - Incremental Repetition – Lyric -
 Metaphysical Poetry– Ode (nondramatic) – Pastoral – Pentameter – Quatrain –
 Refrain – Rhyme - Rhyme Scheme – Rhythm - Slant Rhyme - Sonnet (English v.

Italian Forms) - Spenserian Stanza – Spondaic – Stanza - Syllabic Verse – Tercet - Terza Rima – Tetrameter – Trochaic - Verse

Unit III: Drama

Aside – Catharsis – Chorus - Closet Drama – Comedy - Comedy of Humors - Comedy of Manners - Deus ex machina - Dramatic Irony – Epilogue – Farce – Hamartia – Masque – Melodrama – Mime - Morality Play - Mystery Cycle - New Comedy (Greek) - Ode (Greek drama) - Old Comedy (Greek) – Prologue – Protagonist Sentimental Comedy – Soliloquy - Stock Character - Strophe/Antistrophe – Tragedy - Tragicomedy– Unities

Unit IV: Fiction

Bildungsroman - Episodic plot - Epistolary Novel - First Person - Flat Character - Focalizing - Frame Tale - Free Indirect Style or Discourse - Gothic Novel - Interior Monologue – Metafiction – Narrator - Novel of Manners – Omniscient - Picaresque Novel – Plot - Point of View – Polyglossia - Romance (narrative) - Round Character - Stream of Consciousness - Third Person - Unreliable Narrator

(A) Rhetoric & Style

Allusions – Anticlimax – Antithesis – Aphorism – Apostrophe – Bathos – Epic – Epigram – Ethos – Hyperbole - Logos – Metaphor – Metonymy - Mock Heroic – Onomatopoeia – Oxymoron – Paradox – Pathos – Persona – Personification – Rhetoric - Rhetorical Appeal – Satire - Simile and Epic Simile - Symbol

(B) Literary Theory and critical Terms

Archetype - Author Function – Canon – Conventions – Deconstruction – Dialogic – Discourse - Feminist Criticism - Genre – Grotesque – Hermeneutics - Hybridity (postcolonial) - Intentional Fallacy – Intertextuality – Irony - Marxist Criticism – Metanarrative – Mimesis – Myth – Narratology - New Criticism - New Historicism – Orientalism - Pathetic Fallacy – Parody – Pastiche – Postcolonial – Poststructuralism – Psychoanalytical Criticism - Queer Theory - Reader-Response Criticism – Semiotics - Signifier/Signified – Simulacra - Speech Act Theory - Structuralism – Subaltern - Verisimilitude

Unit V: History of English Language - English Language Teaching

HISTORY OF THE ENGLISH LANGUAGE

Origin of Language - Place of English in the Indo-European family - General Characteristics of Old and Middle English - The rise and growth of Modern English - Growth of vocabulary– Greek, Latin, French, Italian, Scandinavian and other

foreign influences – Word Formation - Change of Meaning - The Makers of English - The Bible, Spenser, Shakespeare, Milton and Dr. Johnson - American English - Indian English - Characteristics of Modern English - Spelling Reform - The English Lexicon.

LINGUISTICS

Definitions – The Nature and Scope of linguistics, Speech and Writing - Form and Meaning - Words, Clause and Phrase – Concord Government– Sentence Pattern – Phonology – Morphology - Idiolect - Dialect - Transformational Generative Grammar.

ENGLISH LANGUAGE TEACHING

The brief history of Language Teaching - English in India – Past, Present and Future

Approaches and Methods of English Language Teaching

Communicative Language Teaching Method - Total Physical Response – The Silent Way

The nature of Human language – Linguistics, Psychology and English Teaching

Outline of Examination:

- The test consists of approximately 75 objective questions on poetry, drama, biography, the essay, the short story, the novel, criticism, literary theory and the history of the language. The questions may be classified into two groups: factual and analytical.
- The analytical questions test the ability to read a literary text perceptively to answer questions about meaning, form and structure, literary techniques, and various aspects of language.
- The Examination is based on literature in English from the British Isles, the United States and other parts of the world. It also contains a few questions on works, translated from other languages.
- The Examination calls attention to authors, works, genres and movements. The factual questions may require a student to identify characteristics of literary or critical movements, to assign a literary work to the period in which it was written, to identify a writer or work described in a brief critical comment, or to determine the period or author of a work on the basis of the style and content of a short excerpt.

BOOKS FOR STUDY AND REFERENCE

Albert, Edward. A History of English Literature. Oxford: Oxford University Press, 1979. Print.

Chowdhury, Aditi and Rita Goswami. A History of English Literature: Traversing the Centuries. Hyderabad: Orient Blackswan, 2014. Print.

Daiches, David. A Critical History of English Literature. London: Secker & Warburg, 1960. Print.

Sanders, Andrew. The Short Oxford History of English Literature. Oxford, UK: Oxford University Press, 1994. Print

A. P.R. Howatt and H. G. Widdowson, *A History of English Language Teaching*. New York: OUP, 2004.

Jack.C.Richards, Theodore.S.Rodgers, *Approaches and Methods in Language Teaching*. UK: Cambridge University Press, 2001.

Bertens, Hans. *Literary Theory: the Basics*. London: Routledge, 2001.

Barry, Peter. *Beginning Theory*. Manchester and New York: Manchester University Press, 2002.

Wood F.T., *An Outline History of the English Language*. Madras : Macmillan, 2001

Yule, George. *The Study of Language*. Cambridge University Press, 1985.

Web sources

<http://english.columbia.edu/graduate/orals-reading-list#Medieval>

THIRUVALLUVAR UNIVERSITY
M.A., DEFENCE AND STRATEGIC STUDIES
SYLLABUS
UNDER CBCS
(With effect from 2017-2018)

The Course of Study and the Scheme of Examination

| Sl. No. | Study Components | | Ins. hrs /week | Credit | Title of the paper | Maximum Marks | | |
|------------|------------------|---------|----------------------|--------|--|---------------|-------------|-------|
| | Course title | | | | | | | |
| SEMESTER I | | | | | | CIA | Uni Exam | Total |
| 1 | Main | Paper 1 | 6 | 5 | Defence Aspects of International Relations | 25 | 75 | 100 |
| 2 | Main | Paper 2 | 6 | 5 | War - Causes, Development and Consequences | 25 | 75 | 100 |
| 3 | Main | Paper 3 | 6 | 5 | Security-Its Dimension & Analysis | 25 | 75 | 100 |
| 4 | Main | Paper 4 | 6 | 5 | National Security Study | 25 | 75 | 100 |
| 5 | Elective | Paper 1 | 6 | 3 | Conflict Resolution | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |

M.A., Defence and Strategic Studies 2017-18 (Syllabus)

| Sl. No. | Study Components | | Ins. hrs /week | Credit | Title of the paper | Maximum Marks | | |
|-------------|------------------|---------|----------------|--------|---|---------------|----------|-------|
| | Course title | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni Exam | Total |
| 6 | Main | Paper 5 | 6 | 5 | Theory and methods in International Relations | 25 | 75 | 100 |
| 7 | Main | Paper 6 | 6 | 5 | India’s Security Policy | 25 | 75 | 100 |
| 8 | Main | Paper 7 | 5 | 4 | Introduction to Peace Studies | 25 | 75 | 100 |
| 9 | Main | Paper 8 | 5 | 4 | Geo-Politics | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 11 | Elective | Paper 2 | 6 | 3 | Third World Security | 25 | 75 | 100 |
| | | | 30 | 23 | | 150 | 450 | 600 |

M.A., Defence and Strategic Studies 2017-18 (Syllabus)

| Sl. No. | Study Components | | Ins. hrs /week | Credit | Title of the paper | Maximum Marks | | |
|--------------|------------------|----------|----------------------|--------|--|---------------|-------------|-------|
| | Course title | | | | | | | |
| SEMESTER III | | | | | | CIA | Uni Exam | Total |
| 12 | Main | Paper 9 | 6 | 5 | Economics and National Security Management | 25 | 75 | 100 |
| 13 | Main | Paper 10 | 6 | 4 | Weapons of Mass Destruction | 25 | 75 | 100 |
| 14 | Main | Paper 11 | 6 | 5 | Low Intensity Conflict | 25 | 75 | 100 |
| 15 | Main | Paper 12 | 6 | 4 | Contemporary International Relations | 25 | 75 | 100 |
| 16 | Elective | Paper -3 | 6 | 3 | Comprehensive Security | 25 | 75 | 100 |
| | | | 30 | 21 | | 125 | 375 | 500 |

M.A., Defence and Strategic Studies 2017-18 (Syllabus)

| Sl. No. | Study Components | | Ins. hrs /week | Credit | Title of the paper | Maximum Marks | | |
|-------------|------------------|----------|----------------------|--------|---|---------------|-------------|-------|
| | Course title | | | | | | | |
| SEMESTER IV | | | | | | CIA | Uni Exam | Total |
| 17 | Main | Paper 13 | 6 | 5 | Conflict Building Measures | 25 | 75 | 100 |
| 18 | Main | Paper 14 | 6 | 5 | Research Methodology in Defence & Strategic Studies | 25 | 75 | 100 |
| 19 | Main | Paper 15 | 6 | 5 | Science and Technology and Security | 25 | 75 | 100 |
| 20 | Main | Paper 16 | 6 | 5 | Area Studies | 25 | 75 | 100 |
| 21 | Elective | Paper 4 | 6 | 3 | War Reporting and Media | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| | Total | 21 | | 90 | | | | 2100 |

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THIRUVALLUVAR UNIVERSITY
MASTER OF DEFENCE AND STRATEGIC STUDIES
SYLLABUS
UNDER CBCS
(With effect from 2017-2018)

SEMESTER-I

PAPER-I

DEFENCE ASPECTS OF INTERNATIONAL RELATIONS

UNIT-1

Introduction–Nation, Nation- State, Nationalism - Narrow Nationalism-
Internationalism - Evolution of Nation- State.

UNIT-2

The Place of Power - Ideology & Ethics in International Relations.

UNIT-3

Theories of war.

UNIT-4

World Order – Cold War and its effects on World Politics.

UNIT-5

UNO-and its Specialized Agencies - Security Council -ICJ, IAEA, etc.,

Reference Books

1. *Palmer, N.D., and H.C., Internationals Relations*, Boston: Houghton Mifflin, 1953.
2. *Jackson, R. and G. Sorensen, Introduction to International Relations: Theory and Approaches*, Oxford : Oxford University Press, 2003.
3. *Frankel.J., International Relations in a Changing World*, London: Oxford University Press, 1977.
4. *Nicholson. M., International Relations: A Concise Introduction*, New York : Palgrave, 2002.

PAPER-2

WAR-CAUSES, DEVELOPMENTS & CONSEQUENCES

UNIT-1

Definition of War, Types of War, war as a Social Institution and its connection with and differences from other forms of social conflict.

UNIT-2

Theories of the Causes of war and Attempts to Abolish War.

UNIT-3

War – Strategy and Tactics Introduction to the meaning and Significance of war, Strategy and National security: Defence policy & Foreign Policy.

UNIT-4

War in Ancient & Medieval India – A Brief Survey of – Mauryas, Rajputs, Mughals, Marathas and Presidency Armies.

UNIT-5

Wars in modern India in the post 1945 era-with special reference to Indo-Pak Wars of 1947, 1965 and 1971 and Sino- Indian War of 1962

Reference Books

1. Majumdar, R.C., **An Advanced History of India**, New York: St. Martin, 1967.
2. Malletson, G.B., **The Decisive Battles of India**, London: W.H. Allen, 1885.
3. Philp, T.R., (ed), **Roots of Strategy**, 1943.
4. Michael Howard, (ed), **The Theory and Practice of War**, 1965.
5. D.G. Chandler, **The Atlas of Military Strategy: the art, theory and practice of war** (London, 1980).
6. Fuller, J.F.C., **The Foundation of the Science of War** (London, 1925).
7. Anjoli Nirmal, **The Decisive Battles of Indian History**, Jaipur: Pointer Publications, 1999.
8. Sarkar, Jadunath., **Military History of India**, Bombay: Orient Longmans, 1970.
9. Das, S.T., **Indian Military: Its History and Development**, Allahabad: Kitab Mahal, 1979.

PAPER-3

SECURITY – ITS DIMENSIONS & ANALYSIS

UNIT – 1

Introduction – Concept of Security – National Security and International Security

UNIT – 2

National Security with reference to the contemporary thinking – National Power & its Elements: Power- Security Relationship

UNIT –3

Models of International Security – Balance of Power, Collective Security, Collective Deference & Non – Alignment

UNIT –4

Threats: Military and Non-Military Threats

UNIT – 5

Formulation of Security and Defence Policies–and Their Linkages.

Reference Books

1. *Bajpai, U.S., (ed) India's Security: The Politico-Strategic Environment*, New Delhi: Lancers Books, 1983.
2. *Dixit, J.N., Across Borders: Fifty Years of India's Foreign Policy*, New Delhi :Picus Books, 1998.
3. *Sathish Kumar, (ed)., Year book on India's foreign Policy*, New Delhi: Deep & Deep, 1993.
4. *Jayaramu, P.S., India's National Security and Foreign Policy*, New Delhi:ABC Publishers 1978.

PAPER-4

NATIONAL SECURITY STUDY

UNIT – 1

Introduction – Concept and meaning of National Security and its Objectives.

UNIT – 2

India's Security Relationship with Russia.

UNIT – 3

India's Security relationship with USA

UNIT – 4

India's Security Problems with Pakistan.

UNIT – 5

India's Security Problems and Policies with China.

Reference Books

1. **Barry, Buzon, People, State and Fear: The National Security problems in International Relations**, Sussex; Wheat sheaf of Books, 1983.
2. **Bajpai, U.S., (ed) India's Security: The Politico-Strategic Environment**, New Delhi: Lancers Books, 1983.
3. **Dixit, J.N., across Borders: Fifty Years of India's Foreign Policy**, New Delhi: Picus Books, 1998.
4. **Sathish Kumar, (ed)., Year book on India's foreign Policy**, New Delhi: Deep & Deep, 1993.

Elective Paper - 1

CONFLICT RESOLUTION

UNIT-1

Parameters of Conflict: Causes and Prevention.

UNIT-2

Conceptual Treatment to Military and Non -Military threats: Internal and External Threats.

UNIT-3

Models of International System: New World Order & Phenomenon of Cold War.

UNIT-4

Conflict Resolution and Methods of Settling International Disputes.

UNIT-5

International Organization: Concepts and Role of IGO's & NGO's and UNO.

Reference Books

1. *Palmer, , and Perkins*, **International Relations**, Boston: Houghton Mifflin, 1953.
2. *Jackson, R. and G. Sorensen*, **Introduction to International Relations: Theory and Approaches**, Oxford: Oxford University Press, 2003.
3. *Frankel.J*, **International Relations in a Changong World**, London: Oxford University Press, 1977.
4. *Nicholson. M.*, **International Relations: A Concise Introduction**, New York: Palgrave, 2002.
5. *Chatterjee, Aneek*, **International Relations Today: Concept and Applications**, New Delhi: Pearson, 2010.
6. *Johari, J.C.*, **International Relations and Politics**, New Delhi:

SEMESTER II

PAPER-5

THEORY AND METHODS IN INTERNATIONAL RELATIONS

UNIT – 1

Theories of International Relations.

UNIT – 2

National Power & its Elements.

UNIT – 3

Brief Introduction to International Law: Definition, Nature and Sources

UNIT – 4

International Law: Laws of Peace and Neutrality.

UNIT – 1

International Law: Laws of war.

Reference Books

1. *Frankel.J., International Relations in a Changong World*, London: Oxford University Press, 1977.
2. *Nicholson. M., International Relations: A Concise Introduction*, New York: Palgrave, 2002.
3. *Chatterjee, Aneek, International Relations Today: Concept and Applications*, New Delhi: Pearson, 2010.
4. *Johari, J.C., International Relations and Politics*, New Delhi: Sterling Publishers, 1985.

PAPER-6

INDIA'S SECURITY POLICY

UNIT – 1

Components of Security Policy of India.

UNIT – 2

Policy formulation -I: Assessment of threats -Internal and External threats

UNIT – 3

Policy Formulation II: Doctrines, Plan and Resources.

UNIT – 4

Policy making and implementation

UNIT – 5

India's Defence and National Security Policies since Independence.

Reference Books

1. **Barry, Buzon., People, State and Fear: The National Security Problems in International Relations**, Sussex; Wheat sheaf Books, 1983.
2. **Bajpai, U.S., (ed) India's Security: The Politico-Strategic Environment**, New Delhi: Lancers Books, 1983.
3. **Waltz, K., Man, the State, and War: A Theoretical Analysis**, New York: Columbia University Press 1959.

PAPER-7

INTRODUCTION TO PEACE STUDIES

UNIT-1

Concept of Peace

Meaning, Definition, Typology of Peace and Violence.

UNIT- 2

Peace Movements:

Concept and practice, History; Types and kinds, peace programmes in India and in the world; International National, Individual and group actions for Peace Movements.

UNIT-3

Role of Peace Movement:

The modern technology for Peace, Role of Govt. and Non- Govt. organizations agencies, role of Leaders Mahatma Gandhi, Ambedkar, Nelson Mandale, Martin Luther King.

UNIT-4.

Peace Organizations:

Gandhi peace Foundation in India, Amnesty International Stockholm International Peace Research Institute, and other International Peace Research Institutes and the role.

UNIT-5

Peace Education

General Goals of Peace Education and peace research.

Reference Books

1. *Gualtung, Johan, The Struggle for Peace*, Gujarat Vidhyapeeth, Ahmedabad,
2. *International Peace Research and Analysis*, New Delhi.
3. *SIPRI, Year Book*

PAPER-8

GEO POLITICS

UNIT – 1

Geopolitics – Concepts Definition & Scope Military Geography – Scope & Content.

UNIT – 2

Geographical and Geo – Political factors in National Security – Frontiers & Boundaries and Buffer Zones.

UNIT – 3

Maritime Boundaries – the Concept of Territorial Waters, continental shelf and Exclusive Economic Zones, IMBL etc.

UNIT – 4

Land locked states – the problem of access to the seas India's Geographical Frontiers.

UNIT – 5

Introduction to Geo- Politics: Geo – Political thoughts of Haushofer, Mackinder and Spike Man. Theory of Heartland, Lebarsarum & Autarchy, Pivot theory.

Reference Books

1. *Das, S.T., Geo-Strategies*, Allahabad: Kitab Mahal, 1985
2. *Black, Jeremy, Cambridge Illustrated Atlas, Warfare, Renaissance to Revolution: 1492 -1792*, (Cambridge: Cambridge University Press, 1996).
3. *William D. Puleston, The Life and Work of Alfred Thayer Mahan*, U.N.S. (New Haven) CT, 1939)
4. *Earl Meade, Edward, Makers of Modern Strategy: Military Thought from Machiavelli to Hitler, 1948*. New Delhi

Elective Paper - 2

THIRD WORLD SECURITY- ITS FEATURES

UNIT-1

Introduction to Third world Countries, Characteristics of Developing Nations.

UNIT-2

Third World Nation's Security Problems.

UNIT-3

Third World Nation's Economic Problems.

UNIT-4

Third World and World Powers.

UNIT-5

Role of Third World countries in UNO.

Reference Books

1. *Subramaniam, K., Defence and Development*, Calcutta: Minerva, 1973.
2. *Deger, S., Military Expenditure in the Third World: The Economy Effects*, London: Routledge, 1986.
3. *Kennedy, Gavin, The Military in Third World*, New York: S. Cribners, 1974.
4. *Khanna, D.D., and P.N. Mehrotra, Defence Verses Development*: Calcutta: Minerva, 1973.

PAPER-9

ECONOMICS AND NATIONAL SECURITY MANAGEMENT

UNIT – 1

Brief Review of Basic Economic Theories.

UNIT – 2

Defence Management

Definition, Levels & Principles of Management, Military Management at National Security level.

UNIT – 3

Management & Resources for Defence

Defence Planning – Analysis of Defence Expenditure – Defence Production ; Role of Public & Private Sectors.

UNIT – 4

War Time Management of Resources

Priority in Management of Resources: Techniques of Control.

UNIT – 5

Effects of war on National Economy

Inflationary Economy: Problems of Balance of Payment and Depletion of Economic Resources.

Reference Books

1. *Subramaniam, K., Defence and Development*, Calcutta: Minerva, 1973.
2. *Kennedy, Gavin, The Military in Third World*, New York: S. Cribners, 1974.
3. *Military Expenditure in the Third World: The Economy Effects*, London: Rutledge, 1986.

PAPER-10

WEAPONS OF MASS DESTRUCTION

UNIT – 1

Evolution of Nuclear Era - from 1945 to current period: Effects from Nuclear Explosion: Blast, Heat, Thermal Radiation and Nuclear Radiations.

UNIT – 2

Chemical and Biological Weapons – Agents and Characteristics

UNIT – 3

Development of Nuclear weapons in the USA & USSR. Types of Missiles, classifications and performance, with special reference to India.

UNIT – 4

Theories of Nuclear warfare – Strategies of Preventive war, Pre-emptive. Attac, Massive Retaliation, Counter Force, counter value, Flexible Response MAD and Deterrence.

UNIT-5

Tactical Nuclear Weapons & Strategic Nuclear Weapons.

Reference Books

1. *Subramaniam, K., Nuclear Proliferation and International Security*, New Delhi: Lancer, 1986.
2. *Pande, S. Future of NPT*, New Delhi: Lancer, 1995.
3. *Knoontz and O' Donnel, Principles of Management*, (Printice, 1976).
4. *Osgood, Robert, Principles of Management*, New Delhi: Printice-Hall, 1978.
5. *Davar, R.S., Management*, Delhi: Cosmos, 1975.
6. *Keatz, James Euerett., Arms Production in the Developing Countries*, London: Lexington Books, 1984.

PAPER-11

LOW INTENSITY CONFLICTS

UNIT-1

Concept of Low Intensity of Conflict, Types and forms: Extremism
Militancy Insurgency and Naxalist movements.

UNIT-2

Terrorism: Causes, Types and Manifestations

UNIT-3

Religious Fundamentalism: Meaning, Concept and Manifestations.

UNIT-4

State and Non -State Actors: Meaning, Concept and Manifestations.

UNIT-5

Counter Terrorism: Means and Methods.

Reference Books

1. *Fraser, T.G., The Arab – Israeli Conflict* (London:1995).
2. *Maj. SitaramJohri, The Indo – Pakistan Conflict of 1965*, Lucknow : Himalayas, 1967.
3. *Weller, Jac, Weapons and Tactics* (London, 1966).
4. Kennedy, Gavin, *The Military in Third World*, New York: S. Cribners, 1974

PAPER-12

CONTEMPORARY INTERNATIONAL SECURITY

UNIT-1

Cold war, Alliances and Military Blocs-NATO, CENTO, SEATO, ANZUS
etc.

UNIT-2

Contemporary Ideologies-Communism, Liberal Democracy, Socialism,
Non-Alignment and Neutrality.

UNIT-3

The Nuclear Weapons and Impact on International Relations.

UNIT-4

Post-Cold War Era and New World Order

UNIT-5

Globalization and New Economic Order.

Reference Books

1. SIPRI-World armament and Disarmament Year Books
2. Appadurai, A-**Force in International Relations**, New Delhi.
3. Huntinton, S.P-**Changing Patterns of Military Politics**, New Delhi.

ELECTIVE PAPER - 3

COMPREHENSIVE SECURITY

UNIT-1

Comprehensive Security: Concept, Meaning, Definition & Components

UNIT-2

Political Security Concept and Meaning: State and Individual, Rights and Duties and constitutional guarantee and remedies

UNIT-3

Economic Security: Financial, Property land and livelihood, Job security, Opportunities in Private Sectors, Pension and terminal benefits.

UNIT-4

Social Security: Human Security Assessment of basic needs-Food and water security -Dignity of life, Woman Security, Security of Children Elders and Orphans.

UNIT-5

Environmental Security: Natural Calamities and Disaster Management during war, Earth Quack, Tsunami, Floods, Cloud-burst, Rain-Havoc etc.

Reference Books

1. Bajpai, U.S., (ed) India's Security: The Politico-Strategic Environment, New Delhi: Lancers Books, 1983.
2. Barry buzan, Environmental Security, New Delhi
3. AnantharamaRao.k, Vision 21st century, Vidya Publishing House, Karnataka India, 2000.

PAPER- 13

CONFIDENCE BUILDING MEASURES

UNIT -1

Concept and meaning of Confidence Building Measures:

UNIT- 2

History of peace making, peace treaties and Negotiations.

UNIT-3

Techniques of peace making, negotiation, mediations arbitration and role of foreign embassies and consuls.

UNIT-4

Case Study 1

India and Pakistan Diplomatic Relations

UNIT-5

Case Study 2

India and China Diplomatic Relations

Reference Books

1. *Maj. Sitaram Johri, The Indo – Pakistan Conflict of 1965*, Lucknow : Himalayas, 1967.
2. *Lt. Gen. A.A.K Niazi, Betrayal of East Pakistan, Karachi: Oxford University Press, 1990.*

PAPER- 14

RESEARCH METHODOLOGY

UNIT-1

Research in Defence and Strategic Studies: Definition, scope, various type of Research, Major steps in Research-Design and Hypothesis.

UNIT-2

Sampling: Meaning, Definition, Need and Types –Data Collection-Primary and Secondary data, tools of data collection- questionnaire and interviews.

UNIT-3

Data Processing and Analyzing: Use of Computer in Social Research- Analysis of Data-Interpretation.

UNIT-4

Peace Research: Application, practical Problems and Research reports

UNIT-5

Case study

Reference books

1. *Pannerselvam R, Research Methodology*, Prentice Hall of India, New Delhi-2004
2. *Green P.E, Research Methodology Decisions*, Prentice Hall of India, New Delhi-1994.

PAPER- 15

SCIENCE & TECHNOLOGY AND SECURITY

UNIT – 1

Relevance of Science and Technology in National Security.

UNIT – 2

A review of Technological changes since the Industrial Revolution until coming of the Nuclear age and their impact on Security.

UNIT – 3

Science and Technology Development in between World Wars.

UNIT – 4

Use of Nuclear Energy in War and Peace.

UNIT – 5

New Technologies and their Relevance, Electronics, Computers and Robotic Sciences

Reference books

1. ISRO Annual Reports
2. Ministry of Science and Technology publications.

PAPER- 16

AREA STUDIES

UNIT - 1

Introduction to Area Studies: Geopolitical study of distribution of different regions of Conflicts and Power centers.

UNIT – 2

South Asia: An indepth study of the geo-strategic importance, social, cultural, and economic developments in all neighboring countries of India and their impact on India.

UNIT – 3

West Asia: Historical background, Geo-Strategic importance, economic & military potential and areas of conflicts.

UNIT – 4

South East Asia: Geographical & Historical background, Interests of super powers and China.

UNIT – 5

Indian Ocean: Geopolitical & economic importance, aspirations and attitudes littoral states. Concepts of Zone of peace and Nuclear free zone.

Reference books

1. *Johari, J.C., International Relations and Politics*, New Delhi: Sterling Publishers, 1985.
2. *Palmer, N.D., and H.C., International Relations*, Boston: Houghton Mifflin, 1991.

Elective paper-4

WAR REPORTING AND MEDIA

UNIT – 1

Introduction to Journalism – Print Media: Newspapers, Magazines, Journals, Annual reports and Year Books

UNIT – 2

Electronic Media: Sources, Types and Characteristics of Data Bases- Internet Sources – Search engines, E-Journals, E-Libraries etc.

UNIT – 3

Mass Communication: Definition, Nature and Scope, Models and Basic Features Mass Communication.

UNIT – 4

Media Skills: Basic Skills of Reporting – Editing, Photo Editing, fundamentals of reporting, writing techniques and Styles.

UNIT – 5

Case Studies plus Dissertation

Reference books

1. Menon, P.K., **Electronic Media and Broadcast**, Jaipur: Avishkar Publishers, 2006.
2. Vishanu Datta, (ed)., **Journalism Today: Trends, Ethics & laws**, New Delhi : Akansha Publishing House, 2006,

THIRUVALLUVAR UNIVERSITY
MASTER OF ARTS
DEGREE COURSE
M.A. ECONOMICS
UNDER CBCS
(With effect from 2017-2018)

The Course of Study and the Scheme of Examination

| S.NO. | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------------------|---------|-------------------|--------|--|---------------|--------------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | |
| 1 | MAIN | Paper-1 | 6 | 5 | Micro Economic Analysis-I | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | Macro Economic Analysis-I | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 6 | 4 | Statistics for Economics-1 | 25 | 75 | 100 |
| 4 | MAIN | Paper-4 | 6 | 4 | Indian Economic Development | 25 | 75 | 100 |
| 5 | ELECTIVE | Paper-1 | 6 | 3 | (to choose 1 out of 3) A. Industrial Economics B. Labour Economics C. Mathematics for Economics | 25 | 75 | 100 |
| | | | 30 | 21 | | 125 | 375 | 500 |
| SEMESTER II | | | | | | | | |
| 6 | MAIN | Paper-5 | 6 | 5 | Micro Economic Analysis-II | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 6 | 5 | Macro Economic Analysis-II | 25 | 75 | 100 |
| 8 | MAIN | Paper-7 | 5 | 4 | Statistics for Economics- II | 25 | 75 | 100 |
| 9 | MAIN | Paper-8 | 5 | 4 | Monetary Economics | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 11 | ELECTIVE | Paper-2 | 6 | 3 | (to choose 1 out of 3) A. Economics of Social Issues B. Economics of Software C. Economics of Business Strategy | 25 | 75 | 100 |

| | | | | | | | | |
|--|--|--|----|----|--|-----|-----|-----|
| | | | 30 | 23 | | 150 | 450 | 600 |
|--|--|--|----|----|--|-----|-----|-----|

| SEMESTER III | | | | | | CIA | Uni. Exam | Total |
|---------------------|----------|----------|-----------|-----------|--|------------|------------------|--------------|
| 12 | MAIN | Paper-9 | 5 | 4 | Public Economics –I | 25 | 75 | 100 |
| 13 | MAIN | Paper-10 | 5 | 4 | International Economics | 25 | 75 | 100 |
| 14 | MAIN | Paper-11 | 5 | 4 | Economics of Growth and Development | 25 | 75 | 100 |
| 15 | MAIN | Paper-12 | 5 | 4 | Research Methodology | 25 | 75 | 100 |
| 16 | MAIN | Paper-13 | 5 | 4 | Environmental Economics | 25 | 75 | 100 |
| 17 | ELECTIVE | Paper-3 | 5 | 3 | (to choose 1 out of 3) A. Economics of Entrepreneurship B. Basic Econometrics C. Health Economics | 25 | 75 | 100 |
| | | | 30 | 23 | | 150 | 450 | 600 |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 18 | MAIN | Paper-14 | 6 | 5 | Public Economics-II | 25 | 75 | 100 |
| 19 | MAIN | Paper-15 | 6 | 5 | Economics of Infrastructure | 25 | 75 | 100 |
| 20 | MAIN | Paper-16 | 6 | 5 | Economic Thought | 25 | 75 | 100 |
| 21 | MAIN | Paper-17 | 6 | 5 | Financial Economics | 25 | 75 | 100 |
| 22 | ELECTIVE | Paper-4 | 6 | 3 | (to choose 1 out of 3) A. Managerial Economics B. Human Resource Development C. Project Work | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |

| Subject | Paper | Credit | Total Credits | Mark | Total Marks |
|------------------|--------------|---------------|----------------------|-------------|--------------------|
| MAIN | 17 | 4-5 | 76 | 100 | 1700 |
| ELECTIVE | 4 | 3 | 12 | 100 | 400 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| Total | 22 | - | 90 | - | 2200 |

**THIRUVALLUVAR UNIVERSITY
M.A. ECONOMICS
SYLLABUS
UNDER CBCS**

(with effect from 2017-2018)

**SEMESTER- I
PAPER - 1**

MICRO ECONOMIC ANALYSIS -I

OBJECTIVES:

Micro Economic theory forms the basic theoretical foundation of the core subject. The concepts, theories and diagrammatical representations use the most important theoretical tools that aids the student to understand the subject.

UNIT- I: Basic concepts

- 1.1 Choice and Scarcity
- 1.2 Positive Vs Normative Economics
- 1.3 Inductive and Deductive Methods
- 1.4 Static and Dynamic Analysis
- 1.5 Partial Vs General Equilibrium Analysis

UNIT-II: Theory of Demand

- 2.1 Utility and Preference Ordering
- 2.2 Demand and Supply Equilibrium
- 2.3 Price, Income and Cross Elasticity of Demand
- 2.4 Derivation of Demand curves (Hicks and Marshall)
- 2.5 Revealed Preference Theory

UNIT-III: Hicksian Analysis

- 3.1 Income and Substitution Effects
- 3.2 Slutsky Theorem
- 3.3 Revision of Demand theory by Hicks – Cobweb Theorem

UNIT-IV: Production and Costs

- 4.1 Production Functions
- 4.2 Least cost combination and Producers Equilibrium

- 4.3 Cobb – Douglas and CES Production Function
- 4.4 Law of Returns and Returns to Scale
- 4.5 Cost- Output Relationship
- 4.6 Short – run and long – run Cost Minimization
- 4.7 Modern theory of Costs

UNIT-V: Market Structure

- 5.1 Equilibrium of the Firm and Industry
- 5.2 Monopoly and Price Discrimination
- 5.3 Measures and Control of Monopoly
- 5.4 Monopolistic competition – Chamberlin's approach
- 5.5 Marginal Cost Pricing
- 5.6 Collusive and Non – Collusive Oligopoly

Reference Books:

1. Baumol.W.J,(1982),Economic theory and Operations Analysis, 4th edition - Prentice Hall of India.New Delhi.
2. Koutsoyiannis.A. (1979), Modern Micro Economics, Macmillan Press - London
3. Ahuja.HL.(1995), Advanced Economic theory, Sultan Chand & Co. New Delhi
4. Samuelson.P.A.(1985),Foundations of Economic Analysis,TATA McGraw Hill,New Delhi.
5. Sen.A.K. (1999) - Micro Economics: Theory and Applications, Oxford University Press, New Delhi.

PAPER - 2

MACRO ECONOMIC ANALYSIS- I

Objectives:

Macro economics forms the functional relationship and essential for the proper comprehension of the different policies and issues at aggregate level. It is more scientific and blends itself with some empirical economic knowledge. Macro economic imbalances and correcting policies are part of the New Economic Policy implemented in India.

UNIT-I : National Income Accounts

- 1.1 National Income Components
- 1.2 Circular flow of income in two, three and four sector models
- 1.3 Stock – flow relationship
- 1.4 Concepts of Social accounting
- 1.5 Input – output accounting and balance of payments accounting
- 1.6 Measuring of Economic welfare

UNIT-II : Theory of Employment

- 2.1 Classical theory of employment - Say's law
- 2.2 Keynesian determination of output and Employment
- 2.3 Vertical aggregate supply curve

UNIT-III : Consumption Theory

- 3.1 Short-run and long-run consumption function
- 3.2 Developments in consumption functions (Absolute income, Relative income, Permanent income and Life cycle hypothesis)
- 3.3 Empirical studies and policy implications of Consumption theory
- 3.4 Multiplier theory
- 3.5 Super - Multiplier theory

UNIT-IV : Investment Theory

- 4.1 Marginal Efficiency of capital and the rate of interest
- 4.2 Private and Public Investment
- 4.3 Interaction of Multiplier and Accelerator
- 4.4 Profit and Neo - Classical theory
- 4.5 Influence of policy measures on investment - empirical evidence

UNIT-V: Neo – Classical and Keynesian views on Interest

- 5.1 Keynes IS – LM curve
- 5.2 Secular Stagnation
- 5.3 IS – LM model with Government sector
- 5.4 Extension to open economy
- 5.5 IS – LM models with labour market and flexible prices

Reference Books:

- 1. Ackley. G.(1978), Macro Economics: Theory and Policy Macmillan, New York
- 2. Shapiro. G.(1996), Macro Economic Analysis, Galgotia Publication, New Delhi.
- 3. Seth. M.L.(2000), Macro Economics, Agarwal Publications, Agra.
- 4. Gupta. R.D.(1999), Keynes and Post Keynesian Analysis .Chand publication, New Delhi.
- 5. Deivedi. D.N.(2005), Macro Economics, New Delhi, Tata Mc Graw Hill.
- 6. Jhingan. M.L.(2000), Macro Economic Theory, Vrinda Publication Ltd, Delhi.

PAPER – 3

PAPER – III STATISTICS FOR ECONOMICS - I

OBJECTIVES:

To help the economics students and to make them know how to apply the statistical tools in economic theory and also enhance the statistical knowledge.

UNIT - I Averages and Dispersion

- 1.1 Statistics; nature, scope, primary and secondary data; classification, tabulation of data.
- 1.2 Measure of central tendency, Mean, Median, Mode, Harmonic and Geometric mean.
- 1.3 Measure of Dispersion; Range, Mean Deviation.
- 1.4 Standard Deviation; Quartile Deviation, Coefficient of Variation.
- 1.5 Skewness and Kurtosis; methods of measuring skewness.

UNIT - II Correlation and Regression

- 2.1 Correlation types, methods- measuring correlation,
- 2.2 Karl pearsons Co-efficient of Correlation–Coefficient of Determination
- 2.3 Properties of the Coefficient of Correlation – Rank Correlation Coefficient
- 2.4 Regression simple-regression model-regression lines; estimation, using regression line.
- 2.5 Partial and multiple regression distinguish between correlation and regression.

UNIT - III Time Series Analysis

- 3.1 Introduction – Utility of Time Series Analysis
- 3.2 Measurement of Trend
- 3.3 Measurement of personal Variations
- 3.4 Measurement of Cyclical Variations
- 3.5 Measurement of Irregular Variations

UNIT - IV Index Numbers

- 4.1 Introduction – Uses of Index Numbers
- 4.2 Test of Adequacy of Index Number formulae
- 4.3 The Chain Index Numbers
- 4.4 Consumer Price Index Numbers
- 4.5 Index Numbers of Industrial Production

UNIT - V Interpolation and Extrapolation

- 5.1 Introduction - Definition of Interpolation and Extrapolation
- 5.2 Significance of Interpolation and Extrapolation
- 5.3 Assumption of Interpolation and Extrapolation

Books of Reference

1. Dr. S.P. Gupta (2015) Statistical Methods, Sultan Chand & Sons, New Delhi.
2. Dr. S.P. Gupta (2008) Elementary Statistical Methods, Sultan Chand & Sons, New Delhi
3. Prof. A.L. Nagar and R.K. Das. 'Basic Statistics', Oxford University Press, New Delhi.
4. Prof. Ronald J. Wonnacott and Thomas H. Wonnacott, 'Statistics'
5. Gupta.S.C and V.K.Kapoor (1997), Fundamentals of Applied Statistics, Sultan Chand and Sons, New Delhi.
6. Gupta.S.P(1997), Statistical Methods, Sultan Chand and Sons New Delhi.
7. Prof. R. Veerachamy, Quantitative Methods for Economics, New Age International Publisher
8. Prof. Pal & Sarkar, Statistics Concepts and Application
9. Prof. Biswal, Probability and statistics
10. Prof. Muralidharan & Syamsundar, Statistical Method for Quality , Reliability and Maintainability
11. Prof. Sounderapandian, Probability, Statistics and Queueing Theory
12. Prof. Rajagopal and Dhanavathan, Statistical Inference
13. Prof. Srivastava and Srivastava, Statistical Inference and Testing of Hypothesis
14. Prof. R.S. Pillai and Bhagavathy, Statistical Methods.
15. Prof. Asthana and Braj Bhushan, Statistics for Social Science (with SPSS Applications)

PAPER - 4

INDIAN ECONOMIC DEVELOPMENT

Objectives:

To enable the students to know the Economic Development of India

UNIT-I: Overview of Economic Performance in Pre – Liberalization Period (details of individual plans not required)

- 1.1 The goals of Indian Five Year Plans before liberalization: growth, modernization, social justice and self – sufficiency
- 1.2 Important policies during pre – liberalization period: land reforms, import substitution emphasis on public sector enterprises, “permit license raj”
- 1.3 The achievements of the Indian economy during first seven five years plan
- 1.4 The failures of Indian economic policy during first seven Five years plan: “Hindu rate of growth”

UNIT-II: New Economic Policy

- 2.1 The rationale for New economic policy: The crisis of 1991
- 2.2 IMF conditionalities; the “structural adjustment programme”
- 2.3 Goals of planning under New Economic Policy
- 2.4 Performance of Indian Economy after economic reform

UNIT-III: Poverty and Employment Issues

- 3.1 Measuring Poverty: Tendulkar Committee Report on Poverty measurement
- 3.2 Causes of poverty in India, overview of poverty alleviation programmes
- 3.3 Impact of economic reforms on poverty (alternate perspectives)
- 3.4 Employment trends in Indian economy after reforms

UNIT-IV: Primary, Secondary and Tertiary Sectors

- 4.1 Impact of economic reforms on agricultural sector
- 4.2 Pricing of agricultural inputs: fertilizer subsidy debate
- 4.3 Liberalization and Industrial development
- 4.4 Privatization debate
- 4.5 Growth of tertiary sector: causes and consequences

UNIT-V: Financial Sector and External Sector

- 5.1 Financial sector reforms: important recommendations of Raguram Rajan Committee on financial reforms
- 5.2 Institutional aspects of reforms: Competition and supervision

- 5.3 Impact of reforms on India's foreign trade
- 5.4 Foreign capitals and the Indian economy

M.A. Economics : Syllabus (CBCS)

References:

1. Uma Kapila (Editor) 2010, Indian Economy Since Independence, Academic Foundation, New Delhi
2. Uma Kapila (Editor) 1998, India's Economic Reforms, Academic Foundation, New Delhi
3. Kaushik Basu and Annemie Maertens (Editors) 2010, The Concise Oxford Companion to Economics in India, OUP India

ELECTIVE

PAPER - 1

A. INDUSTRIAL ECONOMICS

Objectives:

This course aims to introduce the students to know and understand the theoretical and policy issues related to Industrial Sector in India.

UNIT-I : Theories of Industrialization

- 1.1 Meaning of Industrialization, the role of Industry in Economic development
- 1.2 Theories of Industry: Hoffman, Chennery and Gershenkron
- 1.3 Theories of Industrial Location

UNIT-II : Market Structure and Market performance

- 2.1 Concepts and organization of a firm, Market structure – Sellers concentration.
- 2.2 Product differentiation, Entry conditions, Economics of scale.
- 2.3 Profitability and innovation
- 2.4 Growth of firm – Size and Growth, Growth and Profitability of the Firm
- 2.5 Constrains on growth; Productivity and efficiency

UNIT-III : India Industrial Growth & Pattern

- 3.1
- 3.2 Review of Industrial Growth under planning and structural transformation
- 3.3 Changing role of public sector, shortcomings of Public sector
- 3.4 Role of Private sector in India and its limitations
- 3.5 Industrial policy 1991 and subsequent changes, FDI

UNIT-IV : Industrial Finance

- 4.1 Industrial Finance: Owned, External and other components of Funds
- 4.2 Role, Nature, Volume and types of Industrial Finance
- 4.3 State level financial Institutions
- 4.4 Commercial Banks

UNIT-V : Small Scale and Rural Industries

- 5.1 Case for small scale Enterprises
- 5.2 Problems of SSIs and its sickness
- 5.3 Need for Rural Industrialization
- 5.4 Industrial Labour – Structure of Industrial workers
- 5.5 Social Security Legislations; Labour Market Reforms

M.A. Economics : Syllabus (CBCS)

Text Books:

- 1. DESAI. B (1999) Industrial Economy in India 3rd Edition, Himalaya Publishing House, Mumbai
- 2. KUCHHAL S.C (1980) Industrial Economy of India (5th edition) Chaitanya Publishing House, Allahabad

Reference Books:

- 1. Ahluwalia I.J. (1985) Industrial Growth in India, Oxford University Press, New Delhi
- 2. Barthwal R.R (1985) Industrial Economics, Wiley Eastern Ltd., New Delhi

ELECTIVE

PAPER – II

B. LABOUR ECONOMICS

Objectives:

Labour Economics helps the students of Economics to understand the nature of Labour market, Issues related to employment, wage determination, Industrial relations, role of trade unions and the role of the state Government in improving the standards of Labour.

UNIT-I : Labour Market

- 1.1 Nature and characteristics of labour markets in Developing countries like India
- 1.2 Paradigms of Labour Market: Classical, Neo- classical and dualistic model
- 1.3 Analysis of demand supply forces- Demand for Labour market relating to size and pattern of investment, choice of technology and Government Labour policies and their orientation
- 1.4 Supply of Labour in relation to growth of Labour force - Labour Market process

UNIT-II : Employment

- 2.1 Importance of employment in the context of poverty in developing countries
- 2.2 Concept and measurement of unemployment
- 2.3 Causes – Issues relating to employment, rationalization, technological change and modernization.
- 2.4 Rural Unemployment and educated Unemployment
- 2.5 Employment policy under the five-year plans - Evaluation of employment policy in India

UNIT-III : Wage Determination: Theory and Practice

- 3.1 Classical, Neo classical and bargaining theories of wage determination.
- 3.2 Concepts of wages - fair living- problems of implementation of minimum Wages

- 3.3 Wage determination by sectors - Urban and Rural Organised and Unorganised sectors
- 3.4 Wage and non - wage components of Labour recommendation
- 3.5 Wage and productivity- wage and inflation relationship - productivity and profit sharing schemes
- 3.6 Wage differentials in terms of firm, Industry, Occupation, Region, Sex and Skills- wage standardization - case studies - wage policy in India

UNIT-IV : Industrial Relations and Trade Unions

- 4.1 Growth of Industrialization and emergence of Unionism
- 4.2 Theories of Labour movement - Growth structure and pattern of trade union in India
- 4.3 Comparative Labour movements in U.K. ,U.S.A., and EU
- 4.4 Achievements and failures of trade union movements
- 4.5 Determinants of Industrial disputes – Steps to achieve peace – Methods of settling industrial disputes – Collective bargaining- conciliation- arbitration- adjudication - Grievance settlements
- 4.6 Labour participation in management

Unit - V State and Labour

- 5.1 Increasing role of state in determination of Labour matters - Labour policy of the Government in the past
- 5.2 Various social security and labour welfare measures adopted by Government - Comparative account of social security measures adopted in U.K., U.S.A. and EU
- 5.3 Important Labour legislations in India and their implications
- 5.4 Impact of ILO – Government policy towards Labour and trade unions
- 5.5 Agricultural Labour – Child Labour – Labour in Unorganised sectors - VRS Policy

Text Books:

- 1. Lester.R.A.(1964), Economics of Labour, Macmillan, London.
- 2. Connell.C.R. and S.L. Brue (1986), Contemporary Labour Economics, McGraw Hill, New Delhi.

Reference:

- 1. Papola T.S. P.P. Ghosh and A.N.Shama (EDS) (1993) Labour employment: Industrial relation in India, B.R. Publishing Corporation
- 2. Praveen Jha B.R. (2001), Agricultural labour in India, Vikas publication, New Delhi.

ELECTIVE
PAPER - III
C.MATHEMATICAL ECONOMICS

Objective:

To introduce mathematics as a tool to understand marginal concepts in Economics
To enlighten the Mathematical Knowledge of Economics Students

UNIT-I : Matrix

- 1.1 Definition-Types of matrix; Addition and Subtraction; Multiplication
- 1.2 Solving equations - Gaussian elimination; gaussian and Gauss - Jordan Elimination
- 1.3 Determinants; Gramer's rule; Inverse matrix cofactor
- 1.4 Input – Output analysis

UNIT- II : Differential Calculus

- 2.1 Slope of a curve and differentiation; turning points; power rule; higher derivatives
- 2.2 Application in Economics; Marginal functions Average functions; derive from MC and AC.
- 2.3 Slope of a curve and turning points; determining maximum and minimum points; intervals along which a function is increasing or decreasing.
- 2.4 Economic application; TR function; Break Even, profit and loss, Profit Maximization for monopolist

UNIT-III : Differentiation continued

- 3.1 Second order derivatives and Curvature Convex, Concave, point of Inflexion
- 3.2 Application in Economics: TC, AC, MC curves
- 3.3 Derivatives of Exponential and logarithmic functions
- 3.4 Chain Rule; Product Rule; Quotient Rule; Elasticity and the derivatives.

UNIT-IV: Functions of Several Variables

- 4.1 Partial Differentiation; First order partial derivatives; Second order; Differentials small changes
- 4.2 Application in Economics - Production functions; Total, Marginal and Average functions; Isoquants, MRTS

UNIT-V : Integration

- 5.1 Integration as the reverse of differentiation; power rule; Exponential function; Integration by algebraic substitutions
- 5.2 Definite Integral and Area under a Curve, application in Economics; Consumer and Producer Surplus

Recommended Textbook:

Bradley, Teresa and Paul Patton (2008) Essential Mathematics for Economics Bersicess, Wiley India, New Delhi

References:

1. Anthony, Matrix and Norman Biggs (2009) Mathematics for Economics and Finance: methods and modeling Cambridge University, Omen, United Kingdom
2. Rehshaw, Geoff (2009), Maths for Economics; 2nd Edition Oxford University Press, New Delhi.
3. Vittal .P.R.(2012), Business Mathematics and Statistics, Margham Publication, Chennai.
4. Mehta and Madani (2004), Mathematics for Economics Sultan Chand & sons publications, New Delhi.

SEMESTER- II
PAPER - 5
MICRO ECONOMIC ANALYSIS- II

OBJECTIVES:

Micro Economic theory forms the basic theoretical foundation of the core subject. The concepts, theories and diagrammatical representations are the most important theoretical tools that aid the student to understand and grasp the subject.

UNIT-I : ALTERNATIVE THEORIES OF FIRM

- 1.1 Objectives of business firms by MARRIS, SIMON, HALL, and HITCH
- 1.2 Theories of pricing
- 1.3 Sales – Revenue maximization model by Baumol
- 1.4 Williamson's model

UNIT-II : Theory of Distribution

- 2.1 Factor pricing (Monopsony and Bilateral Monopoly)
- 2.2 Theories of Ricardo, Marx
- 2.3 Kaldor – New – Classical approach
- 2.4 Marginal Productivity Theory
- 2.5 Euler's theorem
- 2.6 Pricing of factor under imperfect competition
- 2.7 Labour Unions and collective bargaining

UNIT-III : WELFARE ECONOMICS

- 3.1 Criteria of Social welfare
- 3.2 Pareto Optimality
- 3.3 Problem of Welfare Maximization
- 3.4 Compensation Principle
- 3.5 A.K. Sen's Social Welfare function

UNIT-IV : GENERAL EQUILIBRIUM

- 4.1 Two sector model of General equilibrium
- 4.2 Walrasian Model

UNIT-V : Economics of Uncertainty

- 5.1 Risk Behaviour
- 5.2 Risk Aversion
- 5.3 Portfolio selection
- 5.4 Consumption and competitive firm under uncertainty
- 5.5 Theory of Games

M.A. Economics : Syllabus (CBCS)

Reference Books:

1. Koutsoyiannis . A (1979) Modern Microeconomics Macmillan press, London .
2. Baumol.W.J. (1978) Economic Theory and Operation Analysis, 4th edition - Prentice Hall of India.New Delhi.
3. Stonier, A.W. and Hague.(1980) A Text Book of Economic Theory, Longmans Green, London.
4. Ahuja. H.L. and Hague.(1995), Advanced Micro Economic Theory Sultan Chand & Co. New Delhi.
5. Ferguson.C.E. (1968) Micro Economic Theory, Cambridge University Press, London
6. Hall Varian,(2000),Micro Economic Analysis, W.W.Norton, New York.

PAPER - 6

MACRO ECONOMIC ANALYSIS -II

Objectives:

Macro Economics found the functional relationship and essential for the proper comprehension of the different policies and issues at aggregate level. It is more scientific and blends itself with some empirical economic knowledge. Macro economic imbalances and correcting policies are part of the New Economic Policy implemented in India.

UNIT-I : Demand for Money

- 1.1 Fisher and Cambridge Versions
- 1.2 Keynesian theory of demand for money
- 1.3 Patinkin – Real Balance effect
- 1.4 Approaches of Friedman, Baumol and Tobin
- 1.5 High – Powered money Multiplier

UNIT-II : Inflation

- 2.1 Classical and Keynes theory of Inflation
- 2.2 Monetarist approaches to Inflation
- 2.3 Structuralist theory of Inflation
- 2.4 Short – run and Long – run Phillips Curve
- 2.5 Tobin’s modified Phillips curve
- 2.6 Policies to control Inflation

UNIT-III : Business Cycles

- 3.1 Models of Samuelson, Hicks and Kaldor
- 3.2 Theories of Schumpeter
- 3.3 Control of Business Cycles
- 3.4 Cobweb Theorem
- 3.5 Relative efficacy of Monetary and Fiscal Policies

UNIT-IV : Macro Economic Policy

- 4.1 Macro Economic Goals
- 4.2 Macro Economic equilibrium - Relative roles of Monetary and Fiscal Policies
- 4.3 Rational expectation hypothesis
- 4.4 Disequilibrium of Macro Models

UNIT-V : New Classical and Indian Macro Economics

- 5.1 Policy implications of new classical approach and empirical evidence

- 5.2 Macro economic imbalances
- 5.3 Macroeconomic policy during reform period

M.A. Economics : Syllabus (CBCS)

Reference Books:

1. Aackley G.(1978), Macro Economics: Theory and Policy.Macmillan,New York.
2. Edward Shapiro (1994), Macro Economic Analysis,Harcourt Brace Jivanocich Inc,New York.
3. Seth.M.L.(2000), Macro Economics,Agarwal Publications,New Delhi.
4. Dewivedi.D.N.(2005),Macro Economics, ,Tata Mc Graw Hill, New Delhi.
5. Ahuja.H.L.(2010), Macro Economic Analysis,Chand.S.Publications New Delhi.

PAPER - 7
STATISTICS FOR ECONOMICS-II

OBJECTIVES:

To help the economics students and to make them know how to apply the statistics in economic theory and also enhance the statistical Knowledge.

UNIT-I : PROBABILITY

- 1.1 Introduction- definition and importance.
- 1.2 Calculation of probability
- 1.3 Conditional probability; Baye's theorem

UNIT-II : PROBABILITY DISTRIBUTIONS

- 2.1 Introduction- Binomial distribution
- 2.2 Binomial distribution; normal distributions; standard normal distribution; Poisson distribution; Characteristics, simple problems; use of tables

UNIT-III : SAMPLING DISTRIBUTION AND HYPOTHESIS TESTS

- 3.1 Sampling distributions with and without replacement; sample mean; sample proportion; sample variance
- 3.2 Confidence interval; mean; proportion and variances for a single population
- 3.3 For single population; tests for means, proportions and variances

UNIT-IV : HYPOTHESIS TESTS FOR TWO POPULATIONS

- 4.1 For two population; Confidence intervals for difference of Means; difference of Proportion; for ratios of variance –F test.

UNIT-V : CHI- SQUARE TESTS AND ANALYSIS OF VARIANCE

- 5.1 Chi - Square goodness of fit; Chi - Square test for Equal distributions; Chi - square test for independent Attributes
- 5.2 One way Analysis of Variance; Two way Analysis of Variances

RECOMMENDED TEXTBOOK:

Seymour Lipschutz and John J, Schiller (1999), Introduction to Probability and Statistics, Schaum's Outlines, McGraw – Hill international Editions

REFERENCES:

- 1. Murray R Spiegel - Theory and Problems of Probability and Statistics,

McGraw - Hill Schaum's Outline Series, 1980

2. P.K. Vishwanathan Business Statistics: An Applied orientation, Pearson Education Pvt Ltd, 2003.

PAPER-8
MONETARY ECONOMICS

Objectives

To capture the influence of money on the real economy and
To discuss the recent demand and supply theories of money

Unit-I: Nature of Money

- 1.1 Nature and scope of monetary economics-Traditional and modern-concepts of liquidity
- 1.2 Newlyn-Radcliffe committee
- 1.3 Gurley-Shaw and others

Unit-II Concepts for money

- 2.1 Analysis of the demand for money-transactions demand for money-Baumols asset demand for money.
- 2.2 Keynes speculative demand for money-Hicks and Tobin state preference theory as a theory of the demand for money.
- 2.3 Freidmans restatement-Gurley and Shaw thesis.

Unit-III: Classical and Neo-Classical Views on Money

- 3.1 Neutrality and Non-neutrality of Money
- 3.2 Classical and Neo-Classical Dichotomy
- 3.3 Integration of monetary and value theories.

Unit-IV: Keynesian and Post Keynesian Views on Money

- 4.1 Keynes- Patinkin and the real balance effect- Keynesians vs monetarists
- 4.2 Monetary policy- goals, techniques and constraints
- 4.3 Monetary Transmission Mechanism of monetary policy-time lags.

Unit-V: Money supply and Price Level

- 5.1 Theories of money supply- factors that determine money supply.
- 5.2 Inflation; meaning, theories of inflation
- 5.3 Control of inflation, Recent trends of inflation in India.

Books for Reference

- 1. Hosek, William R. and Frank Zahn, (1971), Monetary Theory, Policy and Financial Markets, McGraw-Hill Book Company, New York.
- 2. Vaish .M.C. (1969), Monetary Theory, Ratan Prakashan, Agra.
- 3. Gosh. B.N. and Rama Gosh, (1989), Fundamentals of Monetary Economics, Himalaya Publication, Bombay.

4. Gibson.W.E.and George G.Kaufman (1975),Monetary Economics, Tata Mc-Graw Hill, New Delhi.

ELECTIVE

PAPER - 2

A. ECONOMICS OF SOCIAL ISSUES

Objectives:

To enable the students to understand the social problems

UNIT-I : Economics of Art and Culture

- 1.1 The economic value of Cultural heritage
- 1.2 Economics and classical music “ Baumol’s cost disease ”
- 1.3 The impact of commercialization on art and culture

UNIT-II : Economics of Drugs

- 2.1 The costs and benefits of farming and legalizing drugs
- 2.2 The concept of “ National Addiction”
- 2.3 Costs and benefits of prohibition

UNIT-III : Economics of Sports

- 3.1 The nature of competition in sports
- 3.2 Economic earnings of sports people “Economies of scale”
- 3.3 Economics of Indian Premier League (IPL)

UNIT-IV : Economics of Discrimination

- 4.1 Economic costs of discrimination
- 4.2 Types of discrimination, Rationale and Pure discrimination
- 4.3 Market state (Gouts) and discrimination

UNIT-V : The Information Economy

- 5.1 The features of the information economy
- 5.2 The market system and the information economy
- 5.3 The impact of the Internet on business and culture

Text Book:

- 1. Robbert Stone Braker, “ The Joy of Economics”, Free online book

ELECTIVE

PAPER - 2

B. ECONOMICS SOFTWARE

Objectives:

A Student of Economics must have knowledge in economics software because the theoretical application of economics had undergone changes in giving priority to understand economics with the help of economic software. Economics and economic software joined together will provide strong technical and scientific foundation in economics.

UNIT-I : Introduction to SPSS

- 1.1 Starting SPSS; SPSS main menus; Working with the data Editor; SPSS Viewer
- 1.2 Importing and Exporting Data
- 1.3 Research in Behavioural Sciences - Qualitative Research; Quantitative Research
- 1.4 Types of Variables - Qualitative Variables; Quantitative Variables
- 1.5 Reliability and Validity - Assessing Reliability; Assessing Validity
- 1.6 Hypothesis Testing - Type I and Type II Errors; Significance Level; One-tailed and Two -Tailed tests

UNIT-II : Descriptive Statistics

- 2.1 Basic Concepts - Measures of Central Tendency; Measures of Variability; Percentiles, Quartiles and Interquartile Range, Skewness and Kurtosis
- 2.2 Using SPSS Descriptive Statistics-Frequencies

UNIT- III : Comparing Means: One or Two Samples t- tests

- 3.1 Basic concept – t- tests and z tests; One sample t-test; independent samples t-test; dependent sample t- test; Dependent (paired) Samples t- test
- 3.2 Using SPSS – One Sample t- test; independent Samples t-test; Dependent Samples t- test

UNIT-IV : Analysis of Variance

- 4.1 Basic concepts – ANOVA Procedure; Factors and Covariates; between, within and Mixed (Between – Within) Designs; Main effects and Interactions; Post – Hoc Multiple Comparisons; Contrast Analysis.
- 4.2 Using SPSS – One Way between – Groups ANOVA; Unplanned and Planned comparisons; Two – Way between – Groups ANOVA

M.A. Economics : Syllabus (CBCS)

UNIT-V : Chi - Square Test of Independence for Discrete Data

- 5.1 Basic Concepts – Chi – Square test of Independence; Contingency Tables; using SPSS Correlation; Regression Coefficient

Recommended Textbook:

- 1. Ajai S. Gaur and Sanjay S. Gaur (2006) Statistical Methods for Practice and Research: A guide to data analysis using SPSS.
- 2. Jamie De Coster,(2004), Data Analysis in SPSS Benton Hall, Oxford OH.
- 3. George .A.Morgan. Nancy.L .and Leech,(2004),SPSS for Introductory Statistics Use and Interpretation, Second Edition, LEA, Lawrence Erlbaum Associates, Publishers, Mahwah, New Jersey, London.
- 4. Nancy .L.Leech and George A.Morgan (2005),SPSS for INTERMEDIATE STATISTICS Use and Interpretation second edition, Lawrence Erlbaum Associates, Publishers Mahwah, New Jersey, London.

ELECTIVE

PAPER - 3

C. ECONOMICS OF BUSINESS STRATEGY

Objectives:

To acquire the students with economics of gaining and sustaining corporate competitive advantage

UNIT-I : Performance and Business Strategy

- 1.1 Defining corporate strategy
- 1.2 Performance; Definition and types
- 1.3 Measuring firm's performance

UNIT-II : Competition Analysis

- 2.1 Structure – Conduct – Performance model (SCP)
- 2.2 SCP and Market Structure
- 2.3 Porter's "Five Forces" model of competition

UNIT-III : Cost Leadership

- 3.1 Defining cost Leadership
- 3.2 Economic Value of cost leadership
- 3.3 Cost Leadership and sustained competitive advantage

UNIT-IV : Product Differentiation

- 4.1 Defining product differentiation
- 4.2 Economic value of product differentiation
- 4.3 Product differentiation and competitive advantage

UNIT-V Mergers and Acquisitions

- 5.1 Economic value of merger's acquisitions
- 5.2 Mergers, acquisition and competitive advantage

5.3 Organizing to implement mergers and acquisition

Text Book:

1. Jay B. Barney (2002) Gaining and sustaining competitive strategy, Delhi, Pearson Education.

References:

1. D. Besanko et.al (2004) Economics of Strategy (John Wiley)
2. Different Economic Dailies

M.A. Economics : Syllabus (CBCS)

SEMESTER- III

PAPER - 9

PUBLIC ECONOMICS- I

Objectives:

This paper aims to make the students to understand the role and functions of the Government policies and operations.. This paper combines a thorough understanding of fiscal institutions with a careful analysis of the issues, which underline budgetary policies in general, and Indian experience in particular.

UNIT-I: Public Revenue

- 1.1 Principles and Theories of Taxation – Classical and Keynesian views on Taxation
- 1.2 Concept of Excess burden of taxation
- 1.3 Problem of double taxation
- 1.4 Incidences and Shifting of Taxation

UNIT-II : Public Expenditure

- 2.1 Wagner's Law – Peacock and Wiseman Hypothesis
- 2.2 Evolution of Public Expenditure
- 2.3 Growth of Public Expenditure
- 2.4 Cost – Benefit Analysis
- 2.5 Appraisal of Public expenditure policy of India

UNIT-III : Principles of Public Finance

- 3.1 Maximum Social Advantage – Objectives – Testing of Social Advantage – Functions of Public finance
- 3.2 Theory of social goods
- 3.3 Market failure – Imperfection – Externalities

UNIT-IV : Role of Government in Mixed Economy

- 4.1 Public and Private sector, private goods, Private goods and merits goods.
- 4.2 Public goods and Merit goods

- 4.3 Performance and evaluation of Public Enterprises in India
- 4.4 Pricing policies – peak load pricing, Administered pricing, Dual pricing, Marginal Cost Pricing, Shadow Pricing
- 4.5 Theory of second best

UNIT-V Welfare base of Public Economics

- 5.1 Pareto Optimality theory
- 5.2 Bergson and Samuelson social welfare function
- 5.3 Arrow's Social Choice
- 5.4 Majority Rule

Reference:

1. Musgrave, R.A and P.B. Musgrave (1976), Public Finance in Theory and Practice, McGraw Hill
2. Tyagi B.P. (2009) Public Finance, Jai Prakash Nath & Co, Meerut
3. Singh S.K. Public Finance in Developed and Developing Countries.
4. Bhatia, H.L. (1997), Public Finance, Nineteenth Edition, Vikas Publishing House Pvt Ltd, New Delhi.
5. Lekhi.R.L.(2006),Public Finance, Kalyani Publishers, Chennai.

PAPER - 10
INTERNATIONAL ECONOMICS

Objectives:

To make the student to understand the theoretical aspects related to international trade and other international organization and to enable the students to know the importance of the international trade.

UNIT-I : Theory of International Trade

- 1.1 Theories of absolute advantage and comparative advantage
- 1.2 Haberler's opportunity cost theory
- 1.3 Modern theory of international trade: Heckcher- Ohlin theory of trade
- 1.4 Kravis and Linder theory of trade - Rybezynski theorem
- 1.5 Causes of emergence and measurement of intra – industry trade and its impact on Developing economies

UNIT-II : Measurement of Gains and Theory of Interventions

- 2.1 Concepts of terms of trade, types and limitations.
- 2.2 Measurement of gains from trade and their distribution
- 2.3 Trade as an engine of economic growth; welfare implications
- 2.4 Non-tariff barriers and their implications

UNIT-III : Balance of Payments

- 3.1 Meaning, components, equilibrium and disequilibrium in the balance of payment
- 3.2 Causes and measures to correct BOP disequilibrium
- 3.3 The process of adjustment under systems of gold standard, fixed exchange rates and flexible exchange rates
- 3.4 Relative merits and demerits of fixed and flexible exchange rate in the contest of growth and development in developing countries

UNIT-IV : Globalization: Trends and Implications

- 4.1 Rise and fall of gold standard and Bretton – Woods system
- 4.2 Role of IMF, IBRD-IMF and World Bank from the point of view of India
- 4.3 Theory of Short – term capital movement (FDI and FII) and East – Asian crisis and lessons for developing countries

- 4.4 Role of WTO, UNCTAD and Asian Development Bank, their achievements and failures

UNIT-V : Trade Policies in India

- 5.1 Recent changes in the direction and composition of trade and their implications
- 5.2 Rationale and impact of trade reforms since 1991 on balance of payments
- 5.3 Problems of India's International debt
- 5.4 Working and regulations of MNCs in India
- 5.5 Instruments of export promotion and recent import and export policies

Text Book:

Paul Krugman (2000) International Economics, Pearson publications, India

Reference:

- 1. Kindleberger C.P. (1973), International Economics, R.D. Irwin publishers, Homewood
- 2. Salvatore. D (1997) International Economics, Prentice Hall, New York
- 3. Soderslon, BO (1990) International Economics, The Macmillan Press Ltd, London
- 4. Jhingan M.L. International Economics, Vrinda Publications (P) Ltd.,

PAPER - 11

ECONOMIC GROWTH AND DEVELOPMENT

OBJECTIVES:

Economic growth and development forms the basic theoretical foundation of the core subject. The concepts, theories and diagrammatical representations use the most important theoretical tools that help the student to understand the subject.

UNIT – I Concepts and factors

- 1.1 Economics of Development – Concepts and Approaches
- 1.2 Characteristics of an Underdeveloped country
- 1.3 Obstacles to economic development
- 1.4 Factors of Economic Growth - Economic and Non- Economic factors
- 1.5 Meaning and Characteristics of Modern Economic Growth

UNIT – II Theories of Economic Development

- 2.1 Schumpeterian Theory – Analysis – Criticism and underdeveloped countries
- 2.2 Rostow's stages of Economic Growth
- 2.3 Nurkse's Theory of Disguised unemployment as a potential
- 2.4 Lewis' Theory of Unlimited Supplies of Labour
- 2.5 Leibenstein's Critical Minimum Effort Thesis

UNIT – III Growth Models

- 3.1 The Harrod – Domar Model
- 3.2 Joan Robinson's Model of Capital Accumulation
- 3.3 Models of Technical Change
- 3.4 The Solow Model of Long – Run Growth
- 3.5 Steady-State Growth

UNIT – IV Measures for economic development

- 4.1 Capital Formation and economic development
- 4.2 Fiscal Policy in economic development
- 4.3 Population Growth and Economic Development
- 4.4 Human Capital Formation and Manpower Planning

4.5 Role of the state in Economic Development

UNIT – V Social and Institutional aspects of Economic Development

- 5.1 Poverty in India – Absolute and Relative , causes of poverty , Poverty Alleviation Programmes
- 5.2 Economic Inequalities in India – Growth Vs Equality, Estimates of Inequality, Causes and Policy Measures
- 5.3 Unemployment- Nature , Extent , causes and Policy measures of Unemployment , Output Vs Employment
- 5.4 Planned Growth with Social Justice
- 5.5 Foreign capital and Technology in India

Reference Books:

- 1. K.K. Dewett and Satish Madhawan – Economics of Growth and Development.
- 2. M.L. Jhingan – The Economics of Development and Planning, Konark Publishers, New Delhi, 2003.
- 3. Adelman, I. (1961), Theories of Economic Growth and Development, Stanford University Press, Stanford.
- 4. Behrman, S and T.N. Srinivasan (1995), Handbook of Development Economics, vol.3 Elsevier, Amsterdam.
- 5. Ghatak, S. (1986), An Introduction to Development Economics, Allen and Unwin, London.
- 6. Gillis, M., D.H. Perkins, M.Romer and D.R. Snodgrass (1992), Economics of Development, (3rd Edition), W.W. Norton, New York.
- 7. Gimmell, N.(1987), Surveys in Development Economics, Balckwell, Oxford.
- 8. Higgins,B. (1959), Economic Development, W.W. Notron, New York.
- 9. Hogendorn, J.(1996), Economics Development, Addison, Wesley, New York.
- 10. Kahkonon, S. and M. Olson (2000), A New Institutional Approach to Economic Development, Vislaar.
- 11. Kindleberger, C.P. (1977), Economic Development, (3rd Edition), McGraw Hill, New York.
- 12. Meier, G.M. (1995), Leading Issues in Economic Development, (6th Edition), Oxford University Press, New Delhi.
- 13. Myint, Hla (1965), The Economics of Underdeveloped Countries, Preager, New York.

PAPER - 12

RESEARCH METHODOLOGY

Objectives:

The objective of this subject is to make the students to know the basic concepts and methods in methodology. This paper helps the students to pursue further research such as M.Phil. and Ph.D.

UNIT-I : Meaning and Scope of Social Research

- 1.1 Meaning – Objectives , Characteristics and uses of social research.
- 1.2 Types of Research. Formulation of a Research Problem

UNIT-II : Formulation of Research Problem and Research Design

- 2.1 Main steps in research - selection of a research problem - Sources, Formulation of a research problem
- 2.2 Research Design - Meaning, Types of Research Design. Characteristics of Good research design. Significance of research design

UNIT-III : Hypothesis and Sampling

- 3.1 Hypothesis – meaning, sources, types, formulation and significance
- 3.2 Characteristics of good hypothesis
- 3.3 Testing the hypothesis, Chi-square test, Null hypothesis
- 3.4 Sampling: Methods of Sampling – Advantages and Limitations
- 3.5 Sampling and Non – Sampling errors

UNIT-IV : Data Collection and Processing

- 4.1 Sources of Data – Techniques of data collection – Questionnaire – Interview Schedule
- 4.2 Case study method –observation-secondary sources.
- 4.3 Data Processing – Editing – Classification – Coding and Tabulation

UNIT-V: Report Writing

- 5.1 Requirements and Mechanics of Report Writing ,format of report writing–Precautions in report writing

- 5.2 Bibliography
- 5.3 Role of Computers in research

Reference:

- 1. Goode W.J. (1952) and Hatt P.K. Methods in Social Research, McGraw – Hill
- 2. Young P (1966) Scientific Social Surveys and Research, Prentice Hall
- 3. Kothari C.R. (2010) Research Methodology: Methods and Techniques, Wiley Eastern Limited

M.A. Economics : Syllabus (CBCS)

PAPER - 13

ENVIRONMENTAL ECONOMICS

Objectives:

In this course students are introduced to the economic way of thinking with reference to environmental issues. The students will learn how economics provides insight on the cause and management of Environmental damage

UNIT-I : Market and the Environment

- 1.1 Introduction to Environmental Economics
- 1.2 The interaction between the Economic system and the Environmental system; the services provided by the Environment for the Economy, Resource flow
- 1.3 Market failure: Environmental damage as Externality
- 1.4 Property rights and Environmental Damage: Coase theorem, overuse of open access resources (‘ tragedy of the commons’)
- 1.5 Government Failure and the Environment

UNIT-II : Market Based Instruments for Pollution Control

- 2.1 The concept of optimum pollution
- 2.2 Limitations of Command and Control approach to pollution control
- 2.3 Pollution taxes
- 2.4 Tradable Permits
- 2.5 Comparison of pollution control instruments

UNIT-III : Environmental Valuation

- 3.1 Cost – benefit Analysis
- 3.2 The importance of environmental valuation, types of environmental value
- 3.3 Travel cost method
- 3.4 Contingent valuation method
- 3.5 Hedonic Pricing method

UNIT-IV : Natural Resource Economics

- 4.1 The distinction between renewable and non – renewable resources
- 4.2 Renewable resources: Importance of forests, causes and consequences of deforestation
- 4.3 Non – renewable resources: Classification of non – renewable resources, Hotelling theorem
- 4.4 Common property resources: distinction between common property and open access resources, ostrom’s “ design principles ” for management of common property resources

M.A. Economics : Syllabus (CBCS)

UNIT-V : Sustainable Development

- 5.1 Global warming- impact of global warming in India.
- 5.2 Economic growth and the Environment: the Environment Kuznets curve
- 5.3 The definition of Sustainable Development, Conditions for Sustainable development
- 5.4 Poverty and the Environmental Degradation
- 5.5 “Green National Accounts”

References:

- 1. Hanley, Nick, J.F. Shogren, and Ben White (2001): Introduction to Environmental Economics (London: Oxford University Press)
- 2. Karpagam M. Environmental Economics (Sterling Publishers, New Delhi)

ELECTIVE

PAPER-3

A. ECONOMICS OF ENTREPRENEURSHIP

OBJECTIVES:

This paper aims to acquire basic knowledge about the entrepreneurship, to encourage students to become entrepreneur, To Know the qualities and problems, Growth of entrepreneurs and entry into the market, Formulation of project and report.

UNIT– I: Concept of Entrepreneurship:

- 1.1 Introduction, Meaning, Characteristics
- 1.2 Types of entrepreneurship
- 1.3 Qualities of An entrepreneur
- 1.4 Functions of entrepreneur
- 1.5 View: Peter Drucker – Schumpeter – Walker

UNIT– II: Women and Rural entrepreneurs:

- 2.1 Women entrepreneur – Definition, concepts
- 2.2 Problem faced by women entrepreneurs - remedies
- 2.3 Development of women entrepreneurs
- 2.4 Rural entrepreneurs - Definition
- 2.5 Problems of rural entrepreneur, promote rural entrepreneurs

UNIT– III: Development of Entrepreneur:

- 3.1 EDP's

- 3.2 Assistance by Govt. and Non govt. agencies
- 3.3 DIC, SIDCO
- 3.4 SIPCOT, TIIC
- 3.5 SIDBI, IDBI

UNIT– IV: Entry into market:

- 4.1 Business idea generation
- 4.2 Marketing feasibility
- 4.3 Financial feasibility
- 4.4 Technical feasibility
- 4.5 Feasibility Study

UNIT– V: Project Appraisal:

- 5.1 Meaning and classification of project
- 5.2 Project ideas
- 5.3 Project formulation
- 5.4 Project report
- 5.5 Project life cycle

Reference:

- 1. P. Saravanelan: Entrepreneurial Development
- 2. C.B.Gupta : Entrepreneurial Development
- 3. Jayshree suresh: Entrepreneurial Development
- 4. Khanka : Entrepreneurial Development
- 5. Saini : Entrepreneurship: Theory &Practice

ELECTIVE

PAPER – 3

B. BASIC ECONOMETRICS

Objectives

To get acquainted with the tools of Econometrics for applied research in Economics.
To impart the knowledge of econometric techniques for better understanding of the methods in Economics.

Unit - I: Nature and scope of Econometrics

- 1.1 The econometric approach– economic theory –
- 1.2 Statistics and econometrics – Nature and use of econometric models.

Unit - II: Linear Regression

- 2.1 Two variable regression – Multiple regression –
- 2.2 Correlation coefficient – Multicollinearity – Extensions of linear regression –
- 2.3 Functional forms – dummy variables – Analysis of variance.

Unit - III: Generalized Least Squares

- 3.1 Heteroscedastic errors – Auto correlation
- 3.2 Errors in variables – Methods of instrumental variable
- 3.3 Grouping of observations and grouping of equations.

Unit - IV: Simultaneous Equation Methods

- 4.1 The problem of identification – Estimation
- 4.2 Two stage least squares – introduction to limited information and full information – maximum likelihood and three stage least squares.

Unit - V: Application of Econometric Models

- 5.1 Application of single equation technique in demand analysis
- 5.2 Aggression problem, Engle's Law, Slutsky's theorem, the consumer's allocation problem — model in relative prices, aggregation over consumers.
- 5.3 Estimation of demand function under different conditions, properties of the estimators — static and dynamic analysis. Estimation of consumption function —
- 5.4 Cross section and time series. Estimation of Production functions: Cobb Douglas.

M.A. Economics : Syllabus (CBCS)

Text Book:

Gujarati, Damodar. Basic Econometrics. Singapore, McGraw Hill Inc., 1995.

References:

- 1. Johnstron.J. Econometric Methods. Singapore, McGraw Hill Inc., 1994.
- 2. Johnson, Aaron.C Jr et al. Econometrics: Basic and Applied. New York, Macmillan Publishing Co, 1987.
- 3. Maddala.G.S. Econometrics. New York, McGraw Hill, 1997.

ELECTIVE

PAPER – 3

C. HEALTH ECONOMICS

OBJECTIVES

To enable the students to understand the importance of health economics

Unit-I : Introduction

- 1.1 Definition of Health Economics
- 1.2 Nature and significance of health economics
- 1.3 Demand and Supply of health care
- 1.4 Characteristics of Demand for and Supply of Health care
- 1.5 Health Indicators.

Unit-II: General Health Issues

- 2.1 Health status of the people in India
- 2.2 Health Care Services in Urban and Rural Areas
- 2.3 Health Inequalities in rural – Urban areas, Vital Statistics
- 2.4 Health Infrastructure in India and Tamil Nadu
- 2.5 Evaluation of Health Programmes since Independence.

Unit-III: Health Care Planning

- 3.1 Health Care Planning
- 3.2 Need for Planning
- 3.3 Process of Planning in Health Sector

3.4 Planning at the Micro level

3.5 Health Management – Management of Health Institutions.

Unit-IV: Mother Child Health Care

4.1 Maternal Mortality – Natal Care – Anemia

4.2 problems during Delivery – Rural and Urban Family Welfare Programmes

4.3 Infant Mortality – Immunization

4.4 Diarrhea Management

4.5 Child Health Care Programmes.

Unit-V : Health Infrastructure and Nutritional Programmes

5.1 Rural Housing – Sanitation – Safe Drinking Water

5.2 Health Care Practice – 108 Ambulance Services

5.3 Implementation of Nutritional Programmes in India, Midday Meals Scheme,

5.4 Integrated Child Development Scheme

5.5 Health Insurance – Health Policy of the Government

REFERENCES:

1. Dhandapani .C (2013) – Prevention of diseases in India, Global Research Applications, New Delhi.
2. Dhandapani .C (2012) – Health Issues and Challenges, Global Research Publications, New Delhi.
3. Culyr . A.J. (2010) – Directory of Health Economics, Edwasd Elgas Publications, Holland.
4. Himanusha Skar, Rout and Prashant Panda (2007) – Health Economics in India, New Century Publications, Delhi.
5. .Preethi Oberoi (2002) – Health Management, Vikas Publications, New Delhi.

SEMESTER IV
PAPER - 14
PUBLIC ECONOMICS - II

Objectives:

This paper aims to make understand the students the role and functions of the Government. This paper combines a thorough understanding of fiscal institutions with a careful analysis of the issues, which underline budgetary policies in general, and Indian experience in particular.

UNIT-I : Tax Structure in India

- 1.1 Income tax, Corporation tax, Excise duty, VAT,
- 1.2 State taxes: Sales tax, Agricultural Income tax
- 1.3 Tax Evasion
- 1.4 Tax Reforms in India
- 1.5 Debate of GST –GST in India

UNIT-II : Public Debt

- 2.1 Theories of Public Debt
- 2.2 Burden of Public Debt - Magnitude and Impact of Public debt in India
- 2.3 Management of Public debt

UNIT-III : Fiscal Policy

- 3.1 Objectives – Fiscal Policy for Stabilization and Growth
- 3.2 Fiscal Policy alternatives – Built – in – Stabilizer
- 3.3 Deficit Financing
- 3.4 Fiscal Reforms in India

UNIT-IV : Fiscal Federalism

- 4.1 Principle of Federal Finance
- 4.2 Fiscal Federalism in India Center – State Financial relation in India
- 4.3 Finance Commission and NIAYT
- 4.4 Recommendations of Fourteenth Finance Commission

UNIT-V : Local Finance

- 5.1 Role of Governments – Sources of revenue and expenditure of Local Government
- 5.2 Evaluation of Panchayat Raj Institutions in India. 73rd and 74th Amendment of the constitution
- 5.3 Role of State Finance commission

Reference:

1. Musgrave, R.A and P.B. Musgrave (1976), Public Finance in Theory and Practice, McGraw Hill
2. Tyagi B.P. (2009) Public Finance, Jai Prakash Nath & Co, Meerut
3. Singh S.K. Public Finance in Developed and Developing Countries
4. Bhatia, H.L. (1997), Public Finance, Nineteenth Edition, Vikas Publishing House Pvt Ltd, New Delhi

PAPER 15

ECONOMICS OF INFRASTRUCTURE

Objectives

The main purpose of this paper is to introduce a course on infrastructure, as it would help the students to understand the strength of infrastructure – physical and social in the process of economic development.

UNIT – I: INTRODUCTION TO INFRASTRUCTURE

- 1.1 Infrastructure and economic development
- 1.2 Infrastructure as a public good
- 1.3 Social and physical infrastructure
- 1.4 Characteristics of public utilities, the case of nationalization, the peak-load and off-load problem
- 1.5 Dual pricing controversy-marginal cost pricing and other methods of pricing in public utilities
- 1.6 Cross subsidization – free pricing, equity and efficiency.

UNIT – II: TRANSPORT ECONOMICS

- 2.1 The structure of transport cost and location of economic activity
- 2.2 Cost function in the transport sector
- 2.3 Pricing principles in the transport sector and demand for transport
- 2.4 Social problems of individual modes of transport- inter model coordination
- 2.5 Government intervention in transport sector
- 2.6 Ports and Maritime Economics

UNIT – II: INFORMATION AND COMMUNICATION TECHNOLOGY

- 3.1 Telephone service – and its coverage – Telecommunication: network, telephone traffic and pricing- principles of decreasing costs in telephone industry
- 3.2 Postal service characteristics and its coverage – criteria for fixation of postal rate
- 3.3 Measurement of standards of service in telephone and postal utilities
- 3.4 Growth and trends in courier, mobile and cellular services in India
- 3.5 Computer – internet connectivity and services
- 3.6 Technology and communication policy in India

UNIT – IV: SOCIAL AND TOURISM INFRASTRUCTURE

- 4.1 The concept of social infrastructure – financing and organization of the social services- private and public sector financing
- 4.2 Pricing of social services and development of social services in Indian plans
- 4.3 Tourism and economic development – role of state in promoting tourism
- 4.4 Tourism planning – infrastructural requirement for marketing tourism

UNIT –V: EDUCATION AND HEALTH

- 5.1 Education and economic growth – human capital vs. physical capital
- 5.2 components of human capital – demand for education – private and social demands
- 5.3 Determinants of demand – cost of education: education expenditure, private cost: social cost
- 5.4 Benefits of education – direct, indirect, private and social benefits
- 5.5 Health dimension of development: determinants of health
- 5.6 Economic dimensions of health care – demand and supply of health care – financing of health care – health insurance.

Recommended / Reference Books

- 1. Baru. R.V : Private health care in India – Social characteristics and Trends (Sage, New Delhi, 1998)
- 2. Beaker GS: Human Capital (National Bureau of Economic Research, New York, 1974)
- 3. Berman P & Khan M.E: Paying for India's Health care (Sage, New Delhi, 1993)
- 4. Berman P [ED]: Human Health sector Reforms in Developing countries – Making Health Development Sustainable [Harvard series on population and International Health, Bosto 1995]
- 5. Bhatia A.K: Tourism Development –Principals and practices [Sterling, New Delhi 1996]
- 6. Blaug M: Introductionto Economics of Education [Penguin, London, 1972]

7. Cohn E & Gaske. T: Economics of Education [Penguin, London, 1989]
8. Crew M.A & Klendorfer P.R: Public Utility Economics [Macmillan, London, 1975]

M.A. Economics : Syllabus (CBCS)

PAPER 16

HISTORY OF ECONOMIC THOUGHT

Objectives:

The study of Economic thought comprises economic ideas of economic thinkers and writers of all ages. It provides the origin of economic history and its development from time to time will be of much use to understand and solve the present economic problems too

UNIT-I : Pre - Classical period

- 1.1 Importance of history of economic thought
- 1.2 Mercantilism: main characteristics
- 1.3 Physiocracy: the concepts of natural order and primacy of agriculture

UNIT-II : Classical School and Karl Marx

- 2.1 Adam smith: Division of labour, theory of economic growth
- 2.2 David Ricardo: Theory of value, Theory of Rent, Comparative advantage theory of Trade
- 2.3 T.R. Malthus: Theory of population, Critique of Say's law and Theory of gluts
- 2.4 Marxian thought: Surplus value, the laws of capitalist motion

UNIT-III : The Neo Classical School

- 3.1 The marginalist revolution: Value (marginal utility theory) and distribution (marginal productivity theory of wages)
- 3.2 General equilibrium: Walras and Pareto
- 3.3 Marshall's contributions
- 3.4 Imperfect competition
- 3.5 Criticism of neo classical school: Institutional economics (Veblen)

UNIT-IV : The Keynesian Revolution and Monetarism

- 4.1 Keynes's criticism of classical theory
- 4.2 Keynesian theory of employment
- 4.3 Keynes and economic policy
- 4.4 Monetarism: Milton Friedman's new quantity theory
- 4.5 Monetarism: Friedman's concept of Natural Rate of Unemployment

UNIT-V : Some Modern Developments

- 5.1 New Institutionalism: asymmetric information, transactions costs
- 5.2 Rational expectations theory
- 5.3 Amartya Sen's Capability theory of welfare

References:

1. Robert B Ekelund and Robert Hebert, A History of Economic Theory and Method.
2. Loganathan .A. (1987),A History of Economic Thought, S.Chand and Company ,New Delhi.
3. Seshadri.G.B.(1997),Economic Doctrines, B.R.Publishing Corporation, New Delhi.

M.A. Economics : Syllabus (CBCS)

PAPER 17**FINANCIAL ECONOMICS****Objectives:**

In this course Students will learn about the theoretical and policy dimensions of financial economic thought

UNIT-I : Financial System:

- 1.1 Structure of Financial System
- 1.2 Functions of Financial Sectors
- 1.3 Equilibrium of Financial Markets
- 1.4 Financial System and Economic Development
- 1.5 Criteria to Evaluate Financial sectors

UNIT-II : Introduction to Security Analysis

- 2.1 Meaning of Risk, Types of risk
- 2.2 Concept and types of Return of Yield
- 2.3 Risk – Return Trade Off
- 2.4 Valuation of Securities
- 2.5 General Principles of Valuation

UNIT-III : Regulatory and Promotional Institutions

- 3.1 RBI, Functions, Role
- 3.2 Objectives of Money policy and Instruments
- 3.3 Commentary on Current monetary Policy
- 3.4 SEBI, functions, Role in Security Market

UNIT-IV : Money Market

- 4.1 Money Market
- 4.2 Instruments

- 4.3 Repo and Reverse Repo rate
- 4.4 Organization of Money market and Participants

UNIT-V : Capital Market

- 5.1 Instruments
- 5.2 Primary Issue – Process
- 5.3 Secondary Market – Stock exchange – Process of trading
- 5.4 Methodology of creating Various Stock Indices

Recommended Text Book

L.M. Bhole (1999), Financial Institutions and Markets, Tata McGraw – Hill publishing Company, New Delhi

References:

Pathak, V. Bahrathi (2008) Indian Financial System, Pearson India Ltd, New Delhi

Khan. M.Y. (2008) Indian Financial System, Tata McGraw Hill, New Delhi

ELECTIVE

PAPER-4

A. MANAGERIAL ECONOMICS

Objectives:

In this course students will learn the application of economic principles in the context of real world business firms

UNIT-I : Managerial Objectives of the firm

- 1.1 Problems with profit – maximization as soul objective of a firm
- 1.2 Agency theory
- 1.3 Sales – Revenue maximization
- 1.4 Corporate growth maximization
- 1.5 Behavioural theories

UNIT-II : Pricing Strategies

- 2.1 Marginal cost pricing
- 2.2 Break – Even pricing
- 2.3 Mark – up pricing

UNIT-III : Investment Appraisal

- 3.1 The Investment selection process
- 3.2 Evaluating and Ranking Investment projects
- 3.3 Cost – Benefit Analysis

UNIT-IV : Fore – casting Techniques

- 4.1 Collecting Information on Consumer behavior
- 4.2 Statistical Estimation of Demand relationships
- 4.3 Forecasting techniques demand, Trend Projection, leading Indicators

UNIT-V : Firm’s Architecture & Organization

- 5.1 Vertical boundaries; Transaction costs
- 5.2 Horizontal boundaries; Economics of scope and diversification
- 5.3 Internal structure; Network and hierarchy

Text Books:

- 1. William Boyes (2009) The New Managerial Economics (Indian Adaptation), New Delhi, Siganta

2. Joseph Nellis and David Parken (2003) The essence of Business Economics, Prentice
– Hall India

B. HUMAN RESOURCE DEVELOPMENT

UNIT-I : The concept

- 1.1 Evolution of the Concept of Human Capital – Meaning – Nature – Significance
- 1.2 Schultz's Approach – Becker's Theory – Solow's Measurement of Human Capital.

UNIT-II : Human Capital Formation

- 2.1 Methods of Human Capital Formation : Education and Economic Growth
- 2.2 Formal Education – Adult Education – Health and Nutrition – Brain Drain
- 2.3 Information about Job Market – Elimination of Social Discrimination
- 2.4 Development Indicators – Human Development Index.

UNIT-III : Human Resource Planning

- 3.1 Human Resource Planning – Meaning – Objectives
- 3.2 Need – Process – Benefits – Problems
- 3.3 Career Planning and Development.

UNIT-IV : Gender and HRD

- 4.1 Gender Dimension and Development of HRD – Gender relations – Gender and Inequality
- 4.2 Gender Disparities in Education, Occupation and Earnings
- 4.3 Women's Empowerment and Economic Development
- 4.4 Gender Development Index in India.

UNIT-V : Population and Development

- 5.1 Work Participation Rate – Male and Female Work Participation Rate
- 5.2 Decadal Variations – Development of Women Entrepreneurship in India
- 5.3 Problems – Prospects – Strategies of HRD.

References:

Books

- 1. Anita Bandrjee & Rajkumar Sen, (2000), Women and Economic Development, Deep & Deep Publications Pvt. Limited, F-159, Rajauri Garden, New Delhi – 110 027.
- 2. Arun Monappa, (1997), Managing Human Resources, Macmillan India Limited, New Delhi

3. Batra V.P. (1998), The Economy and Human Resources, B.R. Publishing Corporation, Ansari Road, Darya Ganj, New Delhi.
4. Lakshmanasamy T. and T.M. Srinivasan, (1997), Economics of Human Behaviour, Allied Publishers, New Delhi – Chennai.
5. Lallan Prasad & A.M. Bannerjee (1985), Management of Human Resources, Sterling Publishers Private Limited, New Delhi.
6. Mitchael V.P. (1995), Human Resources Management and Human Relations, Himalaya Publishing House, New Delhi.
7. Raj Kumar, (2000), Women Problems, Anmol Publications Pvt.Ltd., New Delhi.
8. Suresh Vyas, (1998), HRD Priorities, Pointer Publishers, Jaipur.
9. Dr.(Mrs). E.V. Swarnalatha, (1997), Empowerment of Women Through Self Help.Groups, A Training Manual, Discovery Publishing House, New Delhi

DISSERTATION OR PROJECT WORK.

Guidelines

Page Limit: The Dissertation shall be within a space of about 50-75 pages typed in font size 12, with 1½ line spacing on A4 Size paper.

Title of the Dissertation:

Each Dissertation should contain the following- Dissertation submitted to the college in partial fulfillment of the requirement for the Degree of Master of Arts in Economics by name of the candidate, Department of Economics, Place, Month, Year.

The Dissertation shall contain:

Contents page

The Dissertation copy will include certificate of the supervisor, Declaration and Acknowledgement.

Five chapters

Introductory chapter comprising of scope significance, objectives, hypothesis, methodology limitations review of literature of the study, chapterization, definition and concept if any.

The student can use Quantitative or Qualitative /Descriptive and conclusion.

The final chapter shall contain Summary and conclusions.

At the end of the Dissertation Bibliography must be given in alphabetical/chronological order and necessary appendix may be added.

Submission:

Each student may prepare two copies of the thesis one for her and one copy to be submitted to the Head of the Department duly signed by the supervisor, 15 days before the commencement of the end semester examination.

Guidelines for Evaluation

Style, format and neatness in presentation-----15

Methodology-----15

Chapterization, presentation of the theme-----15

Creativity ,analysis logical reasoning and conclusion -30

Thesis-----75

Viva voce-----25

Total-----100

There will be double valuation for the dissertation by the guide and an external examiner, who will be conducting the viva-voce.

The norms for valuation will be the same as applicable for theory paper.

M.A History : Syllabus (CBSC)

THIRUVALLUVAR UNIVERSITY

Master of Arts

Degree Course

M.A History

CBCS PATTERN

(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S.NO | STUDY COMPONENTS COURSE TITLE | | INS.HRS/WE EK | Credit | CREDIT | TITLE OF THE PAPER | MAXIMUM MARKS | |
|-------------|----------------------------------|---------|------------------|--------|--|-----------------------|---------------|-------|
| SEMESTER I | | | | | | CIA | Uni. Exam | Total |
| 1 | MAIN | Paper-1 | 6 | 5 | Social And Cultural History Of India Upto A.D 1526 | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | Social And Cultural History Of Tamil Nadu From Sangam Age To A.D 1565 | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 6 | 4 | India's Foreign Policy – Since A.D 1947 | 25 | 75 | 100 |
| 4 | MAIN | Paper-4 | 6 | 4 | General Studies For Competitive Examinations | 25 | 75 | 100 |
| 5 | ELECTIVE | Paper-1 | 6 | 3 | (To Choose Any 1 Out Of The Given 3) A. Intellectual History Of India B. Economic History Of India 1526 -1947 Ad C Archives Keeping | 25 | 75 | 100 |
| | | | 30 | 21 | | 125 | 375 | 500 |
| | | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni. Exam | Total |
| 6 | MAIN | Paper-5 | 6 | 5 | Social and Cultural History Of India From A.D 1526 TO A.D 1773 | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 6 | 5 | Social and Cultural History Of India From A.D 1773 TO A.D 2000 | 25 | 75 | 100 |
| 8 | MAIN | Paper-7 | 5 | 4 | Social and Cultural History of Tamil Nadu from AD 1565 to AD 2000 | 25 | 75 | 100 |
| 9 | MAIN | Paper-8 | 5 | 4 | Administrative History Of India | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 11 | Elective | Paper-2 | 6 | 3 | (To Choose 1 Out Of 3) A. India Geography B. History Of The Subaltrn People C. Economic History Of Modern India | 25 | 75 | 100 |
| | | | 30 | 23 | | 150 | 450 | 600 |

M.A History : Syllabus (CBSC)

| S.NO | STUDY COMPONENTS COURSE TITLE | | INS.HRS/WE EK | Credit | CREDIT | TITLE OF THE PAPER | MAXIMUM MARKS | |
|--------------|----------------------------------|----------|------------------|--------|--|-----------------------|---------------|-------|
| SEMESTER III | | | | | | CIA | Uni. Exam | Total |
| 12 | MAIN | Paper-9 | 6 | 5 | History of World Civilizations (excluding India)- Ancient Period | 25 | 75 | 100 |
| 13 | MAIN | Paper-10 | 6 | 5 | Colonialism and Nationalism in Modern India | 25 | 75 | 100 |
| 14 | MAIN | Paper-11 | 6 | 5 | Historiography | 25 | 75 | 100 |
| 15 | MAIN | Paper-12 | 6 | 5 | History of the USA From A.D.1990 to A.D.2000 | 25 | 75 | 100 |
| 16 | ELECTIVE | Paper-3 | 6 | 3 | (To Choose 1 Out Of 3) A. History Of Europe From A.D.1789 To A.D.1919 B. A History of Science and Technology in India A.D. 1858 TO A.D1947 C. Islamic History and Culture from A.D 500 To A.D 750 | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| | | | | | | | | |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 17 | MAIN | Paper-13 | 6 | 5 | History of World Civilizations (excluding India) Medieval and Modern Period | 25 | 75 | 100 |
| 18 | MAIN | Paper-14 | 6 | 5 | International Relations Since AD 1919 | 25 | 75 | 100 |
| 19 | MAIN | Paper-15 | 6 | 5 | Research Methodology in History | 25 | 75 | 100 |
| 20 | MAIN | Paper-16 | 6 | 5 | Contemporary History of India from A.D 1947 to A.D 2002 (or) Project / Dissertation | 25 | 75 | 100 |
| 21 | Elective | Paper-4 | 6 | 3 | (To choose 1 out of 3) A. History of science and technology from ad 1947 to ad 2000. B. Islamic history and culture from a.d.750 to a.d.1258 C. Fundamentals of national Security | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| | | | | | | | | |

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| Subject | Papers | Credit | Total Credits | Marks | Total Marks |
|---------------------|-----------|----------|---------------|----------|-------------|
| MAIN | 16 | 4-5 | 76 | 100 | 1600 |
| ELECTIVE | 4 | 3 | 12 | 100 | 400 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| Total | 21 | - | 90 | - | 2100 |

M.A History : Syllabus (CBSC)

THIRUVALLUVAR UNIVERSITY

M.A. HISTORY SYLLABUS UNDER CBCS

(With effect from 2017-2018 onwards)

I SEMESTER

PAPER – 1

SOCIAL AND CULTURAL HISTORY OF INDIA UP TO A.D 1526

OBJECTIVES

This paper aims at understanding various cultural heritages of our ancient India and to preserve our entity in the present trend of changing cultural phenomenon

UNIT-I

Sources of Ancient Indian History – Indus Valley Civilization – Vedic Culture –Position of Women – Jainism and Buddhism.

UNIT-II

Age of Mauryas – Art and Architecture and Society – Ashoka's Dharma- India between 2nd century BC to 3rd century A.D. – Brahminical Cultural Revival – Gandhara and Madura School of Art.

UNIT-III

Guptas – Art and Architecture – Religion and Society – Paintings –Sculpture – Education – Literature Advent of the Arabs – Social Change and life.

UNIT-IV

Delhi Sultanate – Social Condition – Slave System - Literature Art and Architecture - Moghul Architecture and Society.

UNIT-V

Bhakti Movement – Alvars and Nayanmars – Gurunank – Kabir – Sufi Movement – Social and Culture life Under Vijayanagar rule-Art and Architecture.

Books for Reference.

1. Chandra, Satish, Essays on Medieval Indian History, Oxford University press, New Delhi 2004
2. Chandra, Satish, Medieval India from Sultanate to Moghal Part1 1206 to 1526, Murnad publications New Delhi 1975.
3. Majumdar R.C. An Advanced History of India Macmeillan India.
4. Rizvi S.A. The Wonder that was India Vol.II Penguin Books New Delhi 2000.
5. Sathyanathaiyer.R. A Political and Cultural History of India Vol.1, S.Viswanathan Printers and Publishers Chennai.

PAPER - 2

SOCIAL AND CULTURAL HISTORY OF TAMILNADU FROM

SANGAM AGE TO A.D 1565

OBJECTIVES

Recent researchers in the ancient history of Tamil Nadu has brought to light the glory of the cultural past of the Tamils. The students will acquire knowledge about the Social and cultural aspects of the Tamil Society from the Sangam Age to A.D 1565 in this paper.

UNIT-I

Physical features of Tamilaham – Sources – Sangam Age – Sangam Literature – Socio, Economic and Religious life.

UNIT-II

Kalabhras – Pallavas of Kanchi – Society, Economy, Art and Architecture –Education – Bhakthi Movement.

UNIT-III

First Pandiyan Empire – Society, Economy, Culture, Art and Architecture – Rise of Imperial Cholas – Society – Economy and Culture – Art and Architecture.

UNIT-IV

Second Pandiyan Empire – Society, Economy and Culture – Art and Architecture.

UNIT-V

Muslim Invasion – Society, Economy and Culture Vijayanagar rule – Society – Economy – Culture, Art and Architecture. M.A.

Books for Reference.

1. Balasubramanian. C - The Status of Women in Tamil Nadu during the Sangam Age, 1976.
2. Devanesan. A - History of Tamil Nadu, 1977.
3. Mahalingam .T.V - Administration and Social life under Vijayanagar, 1940.
4. Dr.Minakshi. C - Administration and Social life under the Pallavas,1977
5. Nagaswamy. R - Studies in South Indian History and Culture.
6. Pillay. K.K -A Social History of the Tamils.
7. Srinivasa Aiyengar - History of the Tamils, 1929.

PAPER – 3

INDIA'S FOREIGN POLICY – SINCE A.D 1947

OBJECTIVES

After India became independent, it made constant endeavors for regional cooperation. Even at international level the regional associations have fostered faster economic growth, peace and co-operation. This paper offers insight into India's effort to cultivate good neighborly relations and confidence building in the improvement of relations with the neighbors. The formation of SAARC is a typical example of regional co-operation which the students of modern history are expected to be familiar. This paper fulfills the need.

UNIT-I

India and Pakistan – Areas of Conflict – Kashmir and Border issues – Afghan Crisis – Its Impact on Indo- Pak Relations.

UNIT-II

India and China – Strains and the process of Normalization – Tibetan Issues – India and Nepal – Economic Cooperation.

UNIT-III

India and Bangladesh – Areas of Cooperation and Crisis – India and Bhutan Insurgency in the North Eastern states – India and Burma – Historical Ties.

UNIT-IV

Indo-SriLanka Relations – Ethnic problem in Sri lanka – Peace Process – Indian and Maldives – Political and Cultural ties. UNIT-V Regional Organizations – India's role in the NAM – SAARC and its Activities – Its Future – SAPTA – Nuclearization of South Asia – Its impact.

Books for Reference.

1. Bipan Chandra: India After Independence, 1947-2000. Penguin Books, New Delhi, 2000
2. Chaitanya, Mishra: "Indo-Nepal Relations: A View from Kathmandu", Sage Publications, New Delhi, 1993. M.A. History: Syllabus (CBCS) 22

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3. Dixit,J.N.: Assignment Colombo, Konark Publishers, New Delhi, 1998.
4. Dixit.J.N.: Indian Foreign Policy and Its Neighbours, Gyan Publishing House, New Delhi, 2001.
5. Deb Arinda : Bhutan and India: A Study in Frontier Political Relations.
6. Dutt, V.P.: India's Foreign Policy in Changing World, Vikas Publishing House, New Delhi, 1993.
7. Muhammed Shamsul Haq: Bangladesh in International Politics, Sterling Publishers, 1993.
8. Nanda, B.R. (ed): Indian Foreign Policy: The Nehru Years.
9. Palanithurai, G. & Mohanasundaram,K: Dynamics of Tamil Nadu Politics in Sri Lankan Ethnicity, Northern Book Centre, New Delhi, 1993.
10. Phadis Urmila: Maldives: Winds of Change in the toll state.
11. Ramesh Thakur: The Politics and Economics of India's Foreign Policy.
12. Sathis Kumar (ed): Documents of India's Foreign Policy (1974) The Macmillan co., Delhi, 1977.
13. Shelton U.Kodikara (ed): Dilemmas of Indo-Sri Lanka Relations.
14. Sisir Gupta, K: Kashmir: A Study in India – Pakistan Relations.

PAPER - 4

GENERAL STUDIES FOR COMPETITIVE EXAMINATIONS

UNIT: I

Geography The Earth-Atmosphere-Soils-Minerals, Crops, Forests, Monsoons-Mountain ranges, Rivers, National highways, Airports-National Wild-Life Sanctuaries - Tribes in India.

UNIT: II

Indian Economy- Planning Commission, NDC - New Economic Policy, LPG Liberalization, Privatization, Globalization – Taxes - Currency System.

UNIT: III

Indian Polity - President, Parliament – Judiciary – Centre – state relation – state Government – Panchayat raj - Recent amendments.

UNIT : IV

Bio-technology – Nano Technology – Space research – Oceanography – plate tectonic – Natural Disaster Management.

UNIT : V

Present Day India and World; Indian States-Census, Flag, Emblem, River Valley Projects - Art & Music, Railways-Awards in India and World – Sports - Major Events in India and World - Who is Who - UNO.

REFERENCE BOOKS

1. General studies UPSC and State Civil Services Preliminary Examinations, Unique Publishers.
2. General knowledge Manual, Pearson Publication.
3. India 2012, Publication Division, Government of India.
4. Geography of India, 'M' n 'M' series
5. Dutt and Sundaram – Indian Economy 6. Science and Technology-Spectrum Publications
7. 'The Hindu' National Newspaper
8. Civil Services Chronicle, Competitive Examination Monthly Magazine.

ELECTIVE I

(TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

Paper - 1

A. Intellectual History of India

Objectives

The aim of the paper is to make the students familiar with the life, career, ideals and principal life of the intellectuals of the 20th Century India. The intellectuals of 20th Century india played a crucial role in shaping the course of events which culminated in the attainment of India's independence. The younger generation is expected to take them as role models in developing their own personality.

Unit – I

Political Thinkers :- Surendranath Banerjee – Gopalakrishna Gokhale - Thailak- Mahathma Gandhi - B.R.Ambedkar- Jawarhalal Nehru – Indira Gandhi.

Unit – II

Social Thinkers:- Rajaram Mohanray Veerasailingam Panthalu- Jothiba Phule- Muthulakshmi Reddi –E.V.Ramasamy- Mother Theresa.

Unit –III

Religious Thinkers:- Dayanath Saraswathi –Ramakrishna Paramahamsa-Swami Vivekananda –Sri Saiyed Ahmed Khan.

Unit –IV:

Socialist and communists Thinkers M.N.Ray – S.A Dange – E.M.S Namboodripad Singaravelar –Jeeva

Unit –V:

Literary Thinkers :- Rabindranath Tagore - Mohmed Iqbal –Subramanya Bharathi Thiru-Vi-Ka- Sarojini Naidu –bharathidasan.

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Books for Reference.

1. Ahluwalia, B.K &: Sardar Patel – rebel and ruler, Akbe Group, New Delhi 1981, Shashi Ahluwalia
2. Bharathi : Mahatma Gandhi, Man of the Millennium, S.Chand & Co, New Delhi, 2000
3. D.K. Publications : On Periyar, Chennai. M.A. History: Syllabus (CBCS) 20
4. Gopalakrishnan, M.D.: Periyar, Father of Tamil Race, Emerald Publishers, Chennai.
5. Grover, B.L.& Grovers, S.: A New Look at Modern Indian History, (From 1707 to the Modern Times), S.Chand & Co, New Delhi, 2006.
6. Nanda, B.R.: Jawaharalai Nehru Rebel and Statesman, Oxford University Press, Delhi, 1995.
7. Naravane, V.S.: Modern Indian Thought, Orient Longman, New Delhi, 1978.

PAPER – 1

B. ECONOMIC HISTORY OF INDIA 1526 -1947 AD

UNIT – I

Indian Economy on the advent of the Mughals – Trade under the Mughals – Land Tenure and Revenue settlement under the Mughals – Jagirdhari, Zamindari, Land revenue system under sher shah.

UNIT – II

Agriculture – Policy and development under the Mughals and British rule – Agricultural stagnation – commercial revolution – Peasant Movement.

UNIT – III

Industries – Policy and development, Village industries – small scale and large scale industries under Mughals and British rule – Modern Industries - Labour Movement .

UNIT – IV

Trade and Commerce under the Mughals, Vijayanagar – Marathas – Impact of British rule on Indian Economy – Economic drain.

UNIT – V

Transport and Communication Development – Roadways – waterways and Railways Banking and finance – Genesis of modern Banking Institution.

REFERENCE BOOKS

1. B.L. Grover and : A new look of modern Indian History S. Grover
2. Rothermund : Economic History of India
3. R.C. Dutt : Economic History of India
4. S.P. Nanda : Economic and Social History of Modern India
5. A.L. Srinivatsava : The Mughal Empire
6. S.C. Roychowdry : Social, Culture and Economic History of India
7. L.P. Sharma : History of Medieval India
8. Desai : Economic History of India
9. G. Kaushal : Economic History of India
10. Irfan Habib : The Agrarian System of Mughal India
11. S.S.Kulashetra : The Development of Trade and Industry under the Mughals
12. M.N.Dhar : Studies in the economic and social development of modern

PAPER 1

C ARCHIVES KEEPING

Objectives

1. To define the birth of records and practice of archives keeping
2. To examine different types of preservation techniques
3. To understand explicate the rules to access the records in archives
4. To elucidate the different types of documentation procedures
5. To realise the importance of national and state archives

Learning activities

1. Preparing assignment by using government records
2. Field trip to Tiruchirappalli Archives
3. Field Work in Madras State Archives
4. Experts opinion on Documentation procedure
5. Practical knowledge on records management

Unit – 1

Definition of Archives – Creation of Archives –Uses of Archives – Archives and Library
- Various types of Archives – Materials used for creation – Birth of a document

Unit – 2

History of Archives in Europe and India - Preservation techniques – Enemies of Records
– Rehabilitation of Records – Functions of Archivist

Unit – 3

Functions and Administration: Role of IT in the development of Archives – Rules
relating to accession of records in Archives – Appraisal of Records- Retention Schedule –
Compilation and Publication

Unit – 4

Various aspects of records management such as Documentation practices and filing system, life cycle of a file and nature of modern records – Classification of records and methods of control on mass production

Unit – 5

National Archives of India and Tamil Nadu State Archives – Requirement of Record Room – Administration of Tamil Nadu Archives – Saraswathi Padasala of Tanjore – Jesuits Archives in Shenbaganur – Field Work

Books for Study:

1. D. Thiyagarajan, Archives Keeping, Madurai. (Unit - 1 to 5)

Reference Books

1. Cook, Michael, Archives Administration, Dawson UKI Ltd.

2. Hodson, John, VK, An Introduction to use of Public Records, Oxford Clarendon Press, 1934.

3. Jenkinson Hilary, An Introduction to use of Public records, Oxford Clarendon Press, 1934.

4. Kahn, Gilbert, Filing System and Record Management, New York, 1971.

5. Mac Millan, David (ed), Archives, Techniques and Functions in a Modern Society, Sydney, 1957.

6. Muller, Samuel, Feith, JA, Frunin, R, Manual for the arrangement and description of Archives, Train from the Dutch, New York.

II SEMESTER

PAPER – 5

SOCIAL AND CULTURAL HISTORY OF INDIA FROM A.D. 1526 TO A.D.1773

OBJECTIVES

To help the PG Students to acquire the Knowledge of various dimensions of the life style of the people of India from 1526 to 1773.

UNIT-I

Sources – India Under Mughals – Social and Cultural Conditions – The Ruling Class Mazabdars, Jagirdars, Zaminadars – Peasants – Status of Women – Religion.

UNIT-II

Cultural condition under the Mughals – Literature – Education – Painting – Music – Arts and Architecture.

UNIT-III

Social and cultural History of Marathas.

UNIT-IV

Age of Religious Reformers – Impact of Religious reforms on Sikhs – Hindus – Muslims.

UNIT-V

European Penetration – growth of Indology – Social and Cultural Policy of the East India Company – Activities of Christian Missionaries – Growth of Humanitarianism.

Books for Reference.

1. Chandra, Satish : Essays on Medieval Indian History, Oxford University Press, New Delhi, 2004.
2. Chandra, Satish : Medieval India from Sultanate to Mughal - Part - I, 1206-1526, Haranand Publications, New Delhi, 1975.
3. Habib and Nizami : Delhi Sultanate, Indian History Congress Publications, New Delhi, 1970.

M.A History : Syllabus (CBSC)

4. Luniya, B.N : Indian History and Culture, New Delhi, 1980.
5. Mahajan, V.D : History of Delhi Sultanate, Sultan Chand, New Delhi, 2000.
6. Majumdar R.C, : An Advanced History of India, Macmillan India, Ray Choudari, H.C & Datta, K.K. New Delhi, 1970.
7. Qureshi Ishtiaque Hussain : Administration under the Delhi Sultanate, Kitab Bhavan, New Delhi, 1980. M.A. History: Syllabus (CBCS) 7
8. Rizvi, S.A.A : The Wonder that was India, Vol-II, Penguin Books, New Delhi, 2000.
9. Sharma, L.P : History of Medieval India 1000-1740, Konark Publishers Pvt Ltd, New Delhi, 1994.
10. Sherwani, H.K : The Bahmanis , New Delhi, 1972.

PAPER – 6

SOCIAL AND CULTURAL HISTORY OF INDIA FROM A.D.1773 TO A.D.2000.

OBJECTIVES

Eighteenth, Nineteenth and Twentieth Century Indian History is replete with alien domination and repression and Indian resistance and development. The introduction of western concepts in agriculture, industry and education changed the course of Indian History. The study of this paper will lead to a clear understanding of the various facets of development that took place in the last two and a quarter century of Indian History.

UNIT-I

Education in British and Independent India: Traditional Hindu and Muslim Educational Systems – Patshalas and Madrasas – Introduction of Western Education – Wood’s Despatch – Universities of 1857 – Hunter Commission – Radha Krishna Commission – University Grants Commission: Its Contribution to Higher Education – Kothari Commission – New Education Policy of 1986 – Centres of Higher Education : Indian Institute of Technology, Indian Institute of Managements, National Institutes of Technology and other institutions – Engineering and Information Technology Education : Overview.

UNIT-II

Religious and Social Reform Movements in British India: Brahmo Samaj, Prathana Samaj, Satya Shodhak Samaj, Arya Samaj, Ramakrishnan Mission. Theosophical Society – Swami Narayana (Gujarat), Satnamis and Narayans Guru (Kerala) – Muslim Reform Movements: Deoband, Aligarh, Ahmadiyya, Barelwi and Ahl-i-Hadith Moverments – Sikh Reform Movements: Nirankari and Namdhari Movements – Parsi Reform Movement: Rehnuma-i-Mazdayaznan – Neo Buddhism “Navayana” of Ambedkar.

UNIT-III

Peasant Movements: European Planters and Indian Peasants – Agrarian Crisis during the British period – Kisan Sabha and Ekta Movements in U.P. –Mapilla Rebellion in Malabar – Bardoli Satyagraha in Gujarat – Great Depression and Agricultural Crisis In India – All India Kisan Congress – N.G.Ranga and Swami Shajanand – Karshaka Sangams of Malabar – Kisan Sabhas of Punjab and Bengal – Peasant Movement in Post Independent Tamil Nadu: Peasant and Cauvery, Krishna Water issue.

UNIT-IV

Trade Union Movements: Growth of Trade Union Movements from 1920 to 1947 – Trade Union Movements in Post Independence India (1947-2001): Major Trade Unions M.A. History: Syllabus (CBCS) 18 – AITUC – BMS – INTUC – CITU – HMS – Trade Unions of Tamil Nadu: Progressive Labour front and Anna Thozhilalar Sangam.

UNIT-V

Art and Architecture: Colonial Art and Architecture – Post Independent India: Cultural Development – Sahitya Academy, Sangeet Natak Academy and Sangeet Kala Academy – Accomplished Classical Musicians and Classic Dancers – Painters and Sculptors of Modern India.

Books for Reference

- 1.Chandra, Bipin: India's Struggle for Independence, Penguin Books, New Delhi, 2000.
- 2.Chandra, Bipin: India Since Independence, New Delhi, 2002.
- 3.Chandra, Bipin: Nationalism and Colonialism in Modern India, Orient Longman, New Delhi, 1999.
- 4.Majumdar, R.C. Ray Chaudhari, H.C. and Kalikinkar Datta: An advanced History of India, Macmillan Press, Madras, 1998.
- 5.Jones, Kenetah, W : Socio – Religious Reform Movements in British India, The New Cambridge History of India Series, Foundation Books, Cambridge University Press, New Delhi, 1994.
- 6.Sarkar, Sumit,: Modern India 1885-1947, Macmillan Press, New Delhi, 2002.

PAPER – 7

Social and Cultural History of Tamil Nadu from AD 1565 to AD 2000

Objectives

To understand the developments of Tamil Society, Development of Tamil language, Culture and the advertisement in various titles Since the Nayak rule, that encompasses the service of Christian Missionaries for the Tamil Language and the Gradual advancement of Society through Social returns this work and maratha rule:

UNIT-I

Nayak Society – economy – culture – Paintings and architecture.

UNIT-II

The European Missionaries – Service to Tamil Literature – Cold Well – G.U. Pope-impact on Education.

UNIT-III

Tamil N adu in the 19th and early 20th centuries Maraimalai Adigal – Thanithamizh Iyakkam – Kalyana Sundaram – Trade Union Movement.

UNIT-IV

Justice party – Theayagaraya Chetti –Introducing Reservation –Emergence of Self – Respect Movement – EVR periyar – Dravidan Movement and Revival of the glory of the tamils.

UNIT-V

Development of Industries and Economic Progress – Social Welfare Schemes – Role of Press and Media – Empowerment of women – Achievements in the field of Education.

Books for Reference.

1. Chellam , V.T. : Thamizhaga varalarum panpadum , Manivasagar pathippagam, Chennai, 2005.
2. Pillay k.k. : A Social History of the Tamils University of Madras, Madras, 1969. M.A. History: Syllabus (CBCS) 16
3. Tamil Nadu History, Its people and culture for International Institute of Tamil Nadu Studies , Chennai, 2004.
4. Rajaraman, P: The Justice party, 1916-1937, Poompozhi Publishers, Madras, 1988.
5. Subramanian,P: Social history of the Tamils (1707-1947) D.K. Print world (p) ltd, New Delhi, 1999.

Paper - 8

ADMINISTRATIVE HISTORY OF INDIA

UNIT - I

Administration :- Meaning and scope of Administration – Origin and growth of Public Administration in India – Pre Mauryas – Mauriyan Administration – special reference to city Administration

UNIT – II

Ancient Indian Administration – Harsha – Guptas administrative policies – Introduction to Muslim Administrative systems – General Revenue, Land, Defence and judicial systems Administrative development in India under the British rule.

UNIT – III

Administrative functions in free India - Central Secretariat – Functions and role of the Ministries of Home affairs, Finance, Defence, Human Resource Development- Health, Law and External Affairs – Minister Secretary relationship – O & M in Central Governments.

UNIT – IV

Constitutional Authorities – The Finance Commission planning commission and Comptroller and Auditor General of India – Problems and issues in Central – State Administrative relation- inter Governmental issues.

UNIT – V

Administrative functions of Indian States – State Secretariat – State planning commission – Planning and Schemes – State Public Services – District Administration – Local self Government.

REFERENCES BOOKS

1. B.B. Mishra, the Administrative History of India 1834 – 1947
2. History of Indian Administration vol-I Bharathiya Vidya Bhavan, 1968 B.N. Puri.
3. B.N. Puri, History of Indian Administration Vol-II, 1975.
4. The Evolution of Indian Administration, Agra, Lakshmi Narayan Agarwal, 1970.
5. Uma Meduri – Public Administration in the Globalisation Era , 2010
6. Bidyut Chakrabarty – Public Administration , Orient Longman Ltd , 2007

ELECTIVE II

(TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

PAPER - 2

A. INDIAN GEOGRAPHY

Objectives

1. To understand the Physical Geography.
2. To study the change in Climate.
3. To appreciate the significance of Bio-diversity.
4. To know the importance of ecology.

Learning Activities

1. To prepare chart showing the landscape developments
2. To prepare power point presentation on ecosystem, environmental hazards
3. To make field visits to neighboring industries and farm lands.

Unit - I

Physical Geography: Geological History of India – Location: Area and Boundaries – Major Physical Features – Islands of India - Drainage System of India – Climate : The Seasons, Monsoon, Climatic Regions.

Unit - II

Biogeography : Soil : Important Types, Erosion and Conservation – Natural Vegetation : Major Types, Problems of Deforestation and Conservation measures, Social Forestry, Agro-Forestry. Wild Life.

Unit - III

Economic Geography : Resources and their Classification - Agriculture : Agricultural Regions – Crop Groups – Types of Cultivation – Intensive and Extensive Farming - Important Crops – Agricultural Development in India – Irrigation - Animal Husbandry – Fishing – Mineral Resources : Classification and Distribution – Industries.

Unit - IV

Human Geography : Racial Groups - Composition – Change – Distribution and Density – Population Explosion – India's role on climatic changes. Transport and Communication.

Unit - V

Major Issues : Environmental Degradation – Disaster Management – Pollution : land and water - Population Control – Poverty – Terrorism – Globalization.

Books for study

1. Surender Singh, Geography., Tata McGraw Hills General Studies Manual, 2002.
2. Dr. Tara Chand, Tata McGraw Hills General Studies Manual, 2001. (Unit - 1 to 5)
3. Majit Hussain, Geography of India, Tata McGraw Hill's series, 2008. (Unit - 1 to 5)
4. General Studies Manual, Tata Ma Graw Hill's, 2001.

Reference Books

4. Chauhan, R. N, Geography.
5. Alan Strahler & Arthur Strahler, Physical Geography, II Edition.
6. Dr. Sushil Kumar and Sharma, Environmental Management.
7. Dr. R.B.Singh and Dr. D.K.Thakur, Environmental Management.
8. Henry M. Kendall, Robert M. Glendinning, Clifford H. Macfadden, Introduction to Geography, Third Edition, Harcourt, Press & World, Inc. 1962.

PAPER 2

B. HISTORY OF THE SUBALTERN PEOPLE

Objectives

1. To make the students aware of the conditions of the Subaltern People through Subaltern Studies.
2. To help the students understand the history of the marginalized in order to empower them

Unit – 1

Conceptual clarification on ‘Subaltern Studies’ – identifying the ‘Subaltern’ groups in history the need for studying ‘Subaltern’ People.

Unit – 2

Indian Women through the Ages – Feminist theories – Socioeconomic, political and educational status of women

Unit – 3

Legal protection – National and International mechanisms – Women’s Organizations and Movements – Towards Gender Justice.

Unit – 4

Dalits: History – Discrimination – Role played by Dr. Ambedkar, Mahatma and Phule – Legal protection – National and International mechanisms.

Unit – 5

History of Caste Clashes – from Kizhavanmani to Kodiyangulam) – Dalit organizations and Movements – From Caste Bondage to Liberation.

Books for Study:

1. Desai Neera, Women in Modern India, Ajanta Publishers, New Delhi, 1987.
2. Haskar, Women and Law
3. Kapadia, Family and Marriage in India

Reference Books:

1. Guha Ranjit, Subaltern Studies, (Six Volumes), OUP, New Delhi, 1994.
2. James Massey, A Concise History of Dalits, Bangalore, 1989.
3. Kamble, J.R. Rights and Awakening of Depressed class in India, National Publication, Delhi 1979.
4. Dr. C.M. Agarwal, Facts of Indian Womanhood, (3 Volumes), Indian Publishers, Delhi, 2000

PAPER - 2

C. ECONOMIC HISTORY OF MODERN INDIA

Objectives:

To enable the students to know the Economic Development of India

UNIT-I :

Overview of Economic Performance in Pre – Liberalization Period (details of individual plans not required) - The goals of Indian Five Year Plans before liberalization: growth, modernization, social justice and self – sufficiency - Important policies during pre – liberalization period: land reforms, import substitution emphasis on public sector enterprises, “permit license raj” - The achievements of the Indian economy during first seven five years plan - The failures of Indian economic policy during first seven Five years plan: “Hindu rate of growth”

UNIT-II :

New Economic Policy - The rationale for New economic policy: The crisis of 1991 - IMF conditionalities; the “structural adjustment programme” - Goals of planning under New Economic Policy - Performance of Indian Economy after economic reform

UNIT-III :

Poverty and Employment Issues - Measuring Poverty: Tendulkar Committee Report on Poverty measurement - Causes of poverty in India, overview of poverty alleviation programmes - Impact of economic reforms on poverty (alternate perspectives) - Employment trends in Indian economy after reforms

UNIT-IV :

Primary, Secondary and Tertiary Sectors - Impact of economic reforms on agricultural sector - Pricing of agricultural inputs: fertilizer subsidy debate - Liberalization and Industrial development - Privatization debate - Growth of tertiary sector: causes and consequences

UNIT-V :

Financial Sector and External Sector - Financial sector reforms: important recommendations of Raguram Rajan Committee on financial reforms - Institutional aspects of reforms: Competition and supervision - Impact of reforms on India's foreign trade - Foreign capitals and the Indian economy

References:

1. Uma Kapila (Editor) 2010, Indian Economy Since Independence, Academic Foundation, New Delhi
2. . Uma Kapila (Editor) 1998, India's Economic Reforms, Academic Foundation, New Delhi
3. 3. Kaushik Basu and Annemie Maertens (Editors) 2010, The Concise Oxford Companion to Economics in India, OUP India

SEMESTER III

PAPER – 9

**HISTORY OF WORLD CIVILIZATIONS
(EXCLUDING INDIA) – ANCIENT PERIOD**

Objectives

The main objective of this study is to provide the students of history, a well balanced coverage of the all key factors comprising the world civilization excluding India. Also to help the students with broad based knowledge and understanding of the concept of evolution of Mankind and Culture through the ages and their impact on human lives today.

UNIT-I

Introduction – Definition of Civilization – Comparison between culture and Civilization – Origin and Growth of Civilization – Pre-Historic Culture – Paleolithic and Neolithic Culture.

UNIT-II

River Valley Civilizations – Egyptian Civilization – Mesopotamian Civilization – Sumerian, Babylonian, Assyrian and Chaldean Cultures.

UNIT-III

Persian Civilization – Hebrew Civilization.

UNIT-IV

Classical Civilization – Ancient Greece – Legacy of Greece Hellenistic Civilization – Ancient Rome – Roman Civilization.

UNIT-V

Chinese Civilization – Japanese Civilization – Maya, Aztec and Inca Civilizations.

M.A History : Syllabus (CBSC)

Books for Reference.

1. Burns, Ralph, et al: Western Civilizations.
2. Brinton, Christopher, Wolf: A History of Civilization, Vol I & II, Prentice – hall, Inc, Engle Winks, Wood, New Jersey, 1984.
3. Edward, d'Cruz, S.J: A Survey of world civilization, Lalvani Publishing House, Bombay, 1970.
4. Edward Macnall Burns ; Western Civilization – Their History and their Culture.
5. Gokhale, B.K.: Introduction to Western Civilizations, S.Chand & Co, Pvt.Ltd. New Delhi, 1973.
6. Israel Smith Calre : The Standard History of the World(10 Volumes), Standard historical Society, Cincinnati, 1931.
7. Judd, G.P: History of Civilization.
8. Phul, R.K.: World Civilization.
9. Swain, J.E.: A History of world civilization, Eurasia Publishing House, Pvt.Ltd., New Delhi, 1994.
10. Toynbee, A.J.: A study of History (12 Volumes)
11. Wall Blank, T.W.: Civilization – Past and Present Bailey, N.M.
12. Will Durant,: The story of Civilization (Vol.I & II)
13. Wesley Roehm, A.Morris, : The Record of Mankind, Webster & Edger B, Wesley, D.C. Edgar, B.Health and Company, Boston, 1952.

PAPER-10

Colonialism and Nationalism in Modern India

Unit I. Colonialism and Nationalism

Colonial Structure : Colonial State - Stage of Colonialism Mechanics of Imperial Legitimation: Introduction and Nature of Popular Representation, 1858-1919. Extension of Popular Representation in Government 1919-1947.

Unit II. Early Nationalism And Agitation Politics: 1799-1916

Poligar Mutiny in Tamil nadu 1799, 1801. Vellore Munity in 1806-Revolt of 1857-tribal Movements - moplans - Deccan Riots- Foundation of the Congress- Moderate Congress: Objectives and methods - phase of moderate politics- roots of extremism - Partition of Bengal- Boycott and Swadesi-National Education - Labour unrest- Hindu Muslim relations. Emergence of Communal Politics- the shift to terrorism - Punjab - Tamil Nadu: the Chennai Jana Sangam- Swadeshi movement in Tamil Nadu - Role of Tamil Press -the Congress Split-repression conciliation Muslim League-Revolutionary Terrorism-Home Rule Agitation.

Unit III. Gandhian Era-Mass Nationalism 1917-1925

Impact of War - The Appeal of Gandhi- the Role of Rumour- Champaran, Kheda, Ahmedabad- Gandhi. Khilafat and the Congress - Pressure from below - the all India Movement - Social composition - regional variations - No changes and Swarajists- Vikom- Constructive work- Swarajists Politics.

Unit IV. Nationalist Advances : 1928-1939.

Simon Commission and Nehru Report-Labour upsurge and the Peasant Movement- From Dominion State to Purna Swaraj.

Unit V. Towards Freedom and Partition 1939-1947.

Congress and labour-Congress and Kisans-States People movement- The Left in the Congress- The Tripuri Crisis 1939-1942. The Muslim League and Pakistan- Quit India- The advance of the League Azad Hind-Communists and People's War 1945-1946- INA Trails -RIN Mutiny-1946- Communal Holocaust-Calcutta Noakhali, Bihar, Pinjab-Partition and Independence.

M.A History : Syllabus (CBSC)

Reference :

Baker Johnson, Seal (eds.) Power, Profit and Politics: Essays on imperialism, Nationalism and Change in 20th Century India, Cambridge, 1981.

Bamford,P.C. Histories of the Non Co-Operation and Khilafat Movement. New Delhi: Deep, 1974. Reprint.

Brown Judith. Gandhi's Rise to Power Indian Politics 1915-1922. Cambridge, 1972

Chandra, Bipin. Nationalism an Colonialism in Modern India. New Delhi, 1984.

....., The Rise and Growth of Economic Nationalism in India. New Delhi, 1966

Desai, A.R. Soical Background to Indian Nationalism. Delhi: Vikas, 1978.

Kumar, Kapil. Pesants in Revlot-Tenants Landlords Congress and the Raj in Oudh, 1886-1922. New Delhi: Manohar, 1984.

Kumar, Ravindra. Development of the Congress Constitution. New Delhi.1949.
..... Essays on Gnadhian Politics: The Rowlatt Satyagraha of 1919. Oxford, 1971 Low.D.A (ed). Congress and the Raj. L9ondan,1977.

McLane J.R. Indian Nationalism and the Early Congress Princeton, 1977.

Mehrotra, S.R. The Emergenece of the Indian National Congress. Delhi, 1971.....Towards India's Freedom and Partition. New Delhi, 1979.

PAPER – 11 **HISTORIOGRAPHY**

Objectives

The aim of the paper is to inculcate the knowledge of history of history to the students of history in detail.

UNIT-I

History - Meaning – Definition – Nature and Scope – Value of History.

UNIT-II

History and Allied Studies – Types of History – Whether Science or Art

UNIT-III

Genesis and Growth – Greek - Roman Historiography – Medieval Arab Historiography

UNIT-IV

French and Finish Marxist historians – Evolution of Quantitative History – Modernism
Post – Modernism.

UNIT-V

Indian Historiographers – Bana, Kalhana – Ferishta – Barani – Abul Fazl –VA Smith –
K.P. Jayaswal – JN Sankar – DD Kosambi – K.A. Nilakanta Sasthri Sadhasiva
Pandarathar –K K Pillay- N.Subrahmaniyan.

Books for Reference

1. Rajayyan.K - History: Its theory and Method
2. Sabramanian.N - Historiography
3. Carr.E.H. - What is History?
4. Sheik Ali. B - History: Its Theory and Method
5. Rouse, A.L - The use of History

PAPER – 12

HISTORY OF THE USA FROM A.D.1900 TO A.D. 2000

Objectives

This Paper helps the students to know the political, Economics, Scientific and Technological developments in the USA from A.D.1900 to A.D.2000

UNIT-I

Progressive Era - Theodore Roosevelt and the Square Deal Policy – Big Stick Policy – William Taft – Woodrow Wilson – New Freedom – Role of USA in the First World War.

UNIT-II

Warren k Hardinge – Washington Conference – Coolidge – Hoover – Great Depression – F.D. Roosevelt and New Deal – USA in the Second World War.

UNIT-III

Truman – Fair Deal – Truman Doctrine – N.A.T.O – Cold War – Eisenhower – S.E.A.T.O. – John.F.Kennedy – New Frontier – Civil Rights Movements – Martin Luther King.

UNIT-IV

L.B.Johnson – Great Society – Foreign Policy – Richard Nixon – Watergate Scandal – Ping Pong Diplomacy – Man on the Moon.

UNIT-V

America under President – Jimmy Carter – Ronald Reagan – George Bush (Sr) – Bill Clinton.

Books for Reference.

1. Beard and Beard : New Basic History of the United States, New York, USA, 1985.
2. Dharmaraj, J.C. : History of the USA (1800-2002), Denshi Publication, Sivakasi, 2001.
3. Krishnamurthi : History of the United States of America, 1492-1965, Madurai Printers, Madurai, 1980.
4. Majumdar, R.K.& Srivastva, A.N.: History of the United States of America – From 1845 to Present Day, SBD Publishers and Distributors, New Delhi, 1998.

ELECTIVE III **(to choose any 1 out of the given 3)** **PAPER – 3**

A. HISTORY OF EUROPE FROM A.D.1789 TO A.D.1919

Objectives

The History of Modern Europe is essential because many revolutionary changes that took place in Europe not deeply affected the people of Europe but also the whole world. For instance, the three principles like ‘Liberty, Equality and Fraternity’ of French Revolution paved the way for independence of many nations. Further, the study of this History makes the students to know how the leaders of European Nations struggled hard to achieve their goals. Above all, the study of the First World War makes the students to understand the values and importance of people and their democracy and democratic institutions.

UNIT-I

French Revolution – Causes, Course and results – Era of Napoleon.

UNIT-II

The Congress of Vienna – The Holy Alliance – Concert of Europe – Metternich – Revolutions of A.D. 1830 to A.D. 1848.

UNIT-III

Napoleon III – Third Republic of France – Unification of Italy – Unification of Germany.

UNIT-IV

The Eastern Question – Balkan Crises – Germany Between A.D. 1870 and A.D.1914

UNIT-V

First World War – Treaty of Versailles – Russian Revolution – League of Nations.

Books for Reference.

1. Gooch, G.P: History of Modern Europe 1878 – 1919, S. Chand & Co, New Delhi, 1976.
2. Grant, A.J.& : Europe in 19th Century and 20th Centuries, Orient Longman, London, 1959, Temperly
3. Hayes, C.J.H.: Contemporary Europe Since A.D.1870, Surjeet Publications, New Delhi, 1981.

PAPER – 3

B. HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA A.D.1858 TO A.D.1947

Objectives

Today's world is dependent upon the progress of science and technology. Science and Technology has touched every human being in their progress and development. Students have to be familiar with the History of Science and Technology in India. It will make them understand how far science and Technology has progressed in India and resulted in bringing Socio-Economic changes in the society.

UNIT-I

Introduction - Scientific Tradition in India – Introduction of Modern Sciences by the Europeans – Asiatic Society of Bengal – Zoological Survey of India – Botanical Survey – Geographical Survey – Trigonometrical Survey – Development of Meteorological and Astronomical Sciences.

UNIT-II

Learned Institutes for Development of Science – Indian Association for the Cultivation of Science – Indian Science Congress Association – Institution of Engineers – National Academy of Sciences – Indian National Science Academy.

UNIT-III

Medical Education and Research – Technical Education and Research – Agricultural Education and Research – Veterinary Science – Agricultural and Irrigation – Food Crops – Commercial Crops – Plantation Crops – Engineering and Industry – Cottage Industry – Rural & Urban Arts and Crafts.

UNIT-IV

Transport and Communication – Roads and Bridges – Harbors – Ports and Lighthouses – Waterways.

UNIT-V

Great Scientists – S.Ramanujam, J.C.Bose – C.V.Raman – Role of Universities and Scientific Institutions.

Books for Reference

1. Gupta, S.P.: Science, Technology and Society in Modern Age.
2. Gupta, S.P.: Modern India and Progress in Science and Technology.
3. Kalpana Rajaram: Science and Technology in India.
4. Vadilal Dagli: Science and Technology in India, S.Chand & Co, Ltd. New Delhi, 1982.
5. Varghese Jeyaraj, S.: History and Science and technology, Anns Publications, Uthama Palayam, 2004.
6. Venkatraman, R. : History of Science and Technology, Ennes Publications, Madurai, 1988.

PAPER – 3

C. ISLAMIC HISTORY AND CULTURE FROM A.D.500 TO A.D.750

Objectives

Islam is one of the major religions of the world. It had very humble beginnings in Arabia, but within a short period of time spread to many regions of the ancient world. The study of this paper will introduce the students to the beginnings of Islam, Its prophet, the teachings of Islam and the early Caliphates.

UNIT-I

Jahiliyya Period – Social, Cultural and Religious Life – Early Life of Prophet Muhammad.

UNIT-II

Prophethood – Teachings of Islam – Five Pillars – Quran and Hadith.

UNIT-III

Rightly guided Caliphs: Abu Bakr, Omar, Uthman and Ali – Social, Cultural and Religious Life between 571 and 661 A.D.

UNIT-IV

The Umayyads: Muawiyah – Abdul Malik – Walid and Omar Bin Abdul Aziz – Fall of the Umayyads.

UNIT-V

Contribution of the Ummayyads – Art and Architecture – Literature – Umayyad Administration.

Books for Reference.

1. Abbas : Civilization in Islam, Reference Press, New Delhi, 2005.
2. Ali, Syed Ameer: The Spirit of Islam, Idarah-i-Adabiyat-i-Delli, New Delhi, 1997.
3. Ali, Syed Ammer: History of the Saracens, Kitab Bhavan, New Delhi, 1995.
4. Arnold, Thomas, : The Legacy of Islam, Oxford University Press, 1980.
5. Hitti, Philip.K : History of Arabs, Macmillan India, New Delhi, 1974.
6. Zaydan, Jurji, : History of Islamic Civilization, Kitab Bhavan, New Delhi, 1978.

SEMESTER IV

PAPER – 13

**HISTORY OF WORLD CIVILIZATIONS (EXCLUDING INDIA) MEDIEVAL
AND MODERN PERIOD**

Objectives

The main objective of this study is to provide the students of history, a well balanced coverage of the all key factors comprising the world civilization excluding India. Also to help the students with broad based knowledge and understanding of the concept of evolution of Mankind and Culture through the ages and their impact on human lives today.

UNIT-I

Middle Ages: Rise and Spread of Christianity – The Papacy – Byzantine Civilization – Rise and Spread of Islam – Saracenic Civilization.

UNIT-II

Feudalism – Origin – Merits and Demerits – Crusades – Causes and Results – Monastic orders of Medieval Europe – Growth of Medieval Cities – Progress of Education and Rise of University.

UNIT-III

Transition to Modern Age – Renaissance – Causes – Renaissance in Italy – Results of Renaissance – Geographical Discoveries of 15th and 16th Centuries – causes, Course and Results – Reformation in Germany, France and Switzerland – Counter Reformation.

UNIT-IV

French Revolution and its impact – Romanticism – Industrial and Agrarian Revolutions – Causes, Course and Results – Revolutions of the 20th Century – China, Russia, Latin America.

UNIT-V

Nationalism Vs. Internationalism – League of Nations – United Nations Organization De-Colonization –Nelson Mandela Developments in Science and Technology – Philosophy, Arts and Literature during the Contemporary World.

Books of Reference

1. Burns, Ralph et al: Western Civilizations.
2. Collier : The World's Great Events – 10 Volumes (An Indexed history of the World from earliest times to present day – Illustrated, P.F.& Son Company, New York, 1948.
3. Edward MacNall: Western Civilization – Their History and their Culture, W.W.Norton & Company, Inc New York, 1963.
4. Gokhale,B.K: Introduction to Western Civilization, S.Chand & Co, Pvt.Ltd, New Delhi.1973.
5. Israel Smith Clare: The Standard History of the World, 10 Volumes, Standard Historical Society, Cincinnati, 1931.
6. Judd, G.P.: History of Civilization
7. Phul, R.K: World Civilization
8. Swain,J.E.: A History of World Civilization, Eurasia Publishing House Pvt., Ltd., New Delhi, 1994.
9. Toynbee, A.J: A Study of History (12 volumes)
10. Wallbank, T.w.& Bailey, N.M: Civilization – past and Present.
11. Will Durant: The Story of Civilization (Vol I & II)
12. Wesley Rohem, A et al: The record of mankind, Heath and Company, Boston, 1952.

PAPER – 14 **INTERNATIONAL RELATIONS SINCE AD 1919**

Objectives

There has been increasing internationalization of issues of mankind. Unless the student understand International Relations, they will not be familiar with International issues.

This paper aims at training the students with development in International Relations and Diplomacy.

UNIT-I

Nature of International Relation – National Power and instruments for promotion of National Interests – Diplomacy.

UNIT-II

Inter war years – Reparation – Inter Allied depts – World Economic Crisis – Collective Security League of Nations – Rise of Dictatorship – Totalitarianism.

UNIT-III

Second World War – Peace Settlement – Military Alliances Emergence of Power Blocs – Cold War – UNO – Detente.

UNIT-IV

Disarmament and arms control – Disintegrating USSR – Emerging New World Order – Multi-polar Vs Uni-polar Concepts – Fight against Terrorism – Emergence of India and China.

UNIT-V

Present trends in International Associations (Role of International Associations such as Common Wealth – NAM, SAARC, OAU, ASEAN, G-18, G15, G-77 and European union).

Books of Reference

1. Paloner and Perkins: International Relations, 3rdEd, AITBS Publishers Delhi, 2000.
2. Schuman – F : International Politics 6th Ed. McGraw Hill Book Company, New York, 1958.
3. Schleicher C P : International Relations, New Delhi. 1963.

M.A History : Syllabus (CBSC)

4. Sen AK : International Relations Since 1919, S.Chand & Co., New Delhi 1993.
5. Wrisht Q : The Study of International Relations, Appleton – Century crafts, New York, 1955.
6. Carr.E.H : International Relations between the two world wars, 1919-1939, New York, 1966.
7. Calvecoressi, P. : World Politics since 1945.
8. Moon, P.T. : Imperialism and World Politics , The Macmillan Company, New York, 1926.
9. Morgenthau, Hans.J: Politics among nations, The struggle for Power and Peace, New York, 1973.
10. Palmer and Perkins: International Relations, Third Ed, AITBS Publishers & Distributors, Delhi, 2000.
11. Prakash Chander & Prem Arora : International Relations, Cosmos Bookhive (p) Ltd. Gurgaon.
12. Schleicher, C.P : International Relations , New Delhi, 1963.
13. Schuman, F.: International Politics, 6th Ed, McGRaw Hill Book Company, New York, 1958.
14. Sen.A.K : International Relations since 1919, S.Chand & Co., Ltd, New Delhi, 1993.

PAPER - 15
RESEARCH METHODOLOGY IN HISTORY

Objectives

This paper aims to help the students to understand the methodology so as to pursue research in the field of Historical Studies.

UNIT-I

Definition – Meaning – Nature and Scope – Uses of History.

UNIT-II

Research Methodology – Selection of Topic Review of Literature, Objectives – Hypothesis – Collection of data – Types of data – classification of sources.

UNIT-III

Historical Criticism – External and Internal – Positive and Negative Criticism – Objectivity and Subjectivity in Using of History.

UNIT-IV

Questionnaire and Pilot Study – Evolution Techniques – Analyses.

UNIT-V

Footnotes – Importance and purpose of Footnotes – Endnotes – Bibliography – Annotated Bibliography – Appendix – Index.

Books for Reference

- 1.Reiner G.T. - History its purpose and method.
- 2.Collingwood, R.G. - The idea of history
- 3.Khan, S.A., - History and Historians of British India.
- 4.Majumdar, R.K.and Srivastava, A.N. – Historiography, Delhi.1975
- 5.Sen, S.P.(Ed) – Historians and historiography in modern Indian, 1973.

PAPER - 16

CONTEMPORARY HISTORY OF INDIA FROM A.D 1947 TO A.D 2002

UNIT- I

Framing of Indian Constitution - Constituent Assembly – Draft Committee Report – declaration of Indian Constitution – Process of National Consolidation and Integration of /Indian States – Role of Sardar Patel – Kashmir issue- Indo – Pak war 1948 .

UNIT - II

Nehru Era – First General Election of 1952. Five year plans – Democratic socialism and mixed Economy – Planning and land Reforms – Reorganizations of linguistic States 1956 - Kamaraj Plan and Bhuvanesar Congress.

UNIT - III

India After Nehru – the role of Lal Bahadur Sastri – Pak aggression – the treaty of Tashkent – Vision of New India – Indira Gandhi – Congress split – Economic Policy; Nationalization of Banks – Abolition of privy purse – 1971 – Mid-term poll – 20 point Programme – Authoritarian Politics – Total Revolution (J.P.Narayan – Allahabad Judgement. proclamation of emergency – Policies of Repression – General Election 1977 – New Political Alignment - Janata Party Govt. – Morarji Rule – breakup – Charansingh Premiership.

UNIT - IV

Re-emergence of Indira Gandhi – Election of 1980 – NAM Conference at Delhi – Punjab Crisis; Blue star operation-Assassination of Indira Gandhi – Era of Liberalism Prime ministership of Rajiv Gandhi – New Economic Policy – Domestic policy – Nagarajalingam and Panchayat Raj.

UNIT - V

National front Govt-V.P. Singh – Mandal commission - the issue of Ram Janna Boomi – fall of Govt. 1991 Election – Restoration of congress Regime – Narasimha Rao – Economic policies – the Role of Manmohan Singh as finance Minister – United front govt. Regionalism and instability in India.

M.A History : Syllabus (CBSC)

REFERENCE BOOKS:

1. V.D. Mahajan - Contemporary History of India Chand & Company, New Delhi. Vol. I & II
2. Bepin Chandra - Contemporary History of India
3. Venkatesan - Contemporary History of India
4. C.P.Bhambhri - Indian Politics since Independence Vol : I , NewDelhi,1995
5. S.Gopal - Jawaharlal Nehru , A Biography , Vol:I ,1889- Cambridge , 1956
6. Palmar D.Norman - The Indian Political System , 2nd Ed.,Boston , 1971.
7. Partha Chatterjee - State and Politics in India , New Delhi , 2002
8. Publication Division - India : 40 years of Independence
9. Publciation Division - Era of Rapid Change , 1947 – 1971.

PROJECT /DISSERTATION WITH VIVA VOCE GUIDELINES

The Project/ Dissertation with Viva-Voce in M.A Degree Course in History has to be guided by the teachers who handle P.G. Classes in their subject in consultation with the respective teachers under whom they are assigned to work. The workload for guidance has to be treated on par with the teaching hours of two theory papers. Students have to submit the Project/Dissertation at least 15 days before the commencement of their Theory paper examinations. Students have to write the Project/Dissertation in not less than 40 and not more than 50 pages adopting the techniques of Research Methodology offered in the Semester. It has to contain 3 to 4 chapters apart from the introduction and conclusion. There shall be review of the progress of Project/ Dissertation writing every week the teachers who guide the students so as to expedite the completion of the work.

Evaluation of the project / Dissertation

The Project / Dissertation has to be awarded 100 marks (External Evaluation 75 marks and Viva-Voce Examination 25 marks). The External Evaluation and Viva-Voce Examination has to be done by involving the teachers from the neighbor institution within the jurisdiction of the University where P.G. History Program is offered.

ELECTIVE -IV **(to choose any 1 out of the given 3)** **PAPER – 4**

A. HISTORY OF SCIENCE AND TECHNOLOGY FROM AD 1947 TO 2000

Objectives

Today's world is dependent upon the progress of science and technology. Science and Technology has touched every human being in their progress and development. Students have to be familiar with the History of Science and Technology in India. It will make them understand how far Science and Technology has progressed in India and resulted in bringing Socio-Economic changes in the Society.

UNIT-I

A Survey of the Development of Science and Technology under the British Rule - Government of India's Science and Technology Policy since 1950 - Department of Science and Technology - Research and Development Programme - Science and Technology programmes for Socio - Economic Development.

UNIT-II

Development of Agricultural Science - Research and Education - Agricultural Engineering and Technology – Indian Council of Agricultural Research - Crop Science and Horticulture - Animal Science and Veterinary colleges - Biotechnology Development - Crop and Animal Biotechnology.

UNIT-III

Development of Space Science - Development of Satellite Systems - Insat System - Electronic Developments and Production - Information Technology - I.T. Act 2000 - Telecommunication - Software Technology Parks - I.T. for the Masses.

UNIT-IV

Higher Technology Development - Atomic science - Atom for Peace - Atomic Energy and Nuclear Power Programme - Atom for War and Pokhran I & II.

UNIT-V

Oceanography - Ocean Development - Marine Living Resources and Non-living Resources - Agriculture and Marine Biotechnology - Polar Science and Antarctic Expeditions - Institutes Connected with Ocean Research.

Books for reference:

1. Kalpana Rajaram - Science and Technology in India Kuppuram and Kumudhamani - History of Science and Technology
2. O.P. Jaggi - Science and Technology
3. G. Kaushal - Economic History of India
4. G.B. Jathar & S.G. Beri - Indian Economics Vol. II
5. S.P. Gupta - Modern India and progress in Science and Technology
6. S.P. Gupta - Science Technology and Society in the Modern Age.
7. India, 2000, Indian, 2001 (Publications Division, Government of India)

PAPER – 4

ISLAMIC HISTORY AND CULTURE FROM A.D.750 TO A.D.1258

Objectives

The Abbasid Caliphate witnessed tremendous growth in terms of its spread in Asia, Africa and Europe. The Abbasids made remarkable contribution to world civilizations, indeed they provided the needed link between the ancient and the moderns. A study of the paper will immensely help the students to understand Islamic history, culture and civilization better.

UNIT-I

Rise of the Abbasids – Saffah and Mansur - Harun Al-Rasheed – Mamun Al-Rasheed.

UNIT-II

Mutawakkil – Sultan Salahaddin Ayyubi – Crusades – Downfall of the Abbasids, Fatimids of Egypt – Obaidullah Al-Mahdi – Al-Mansur – Al-Muizz-Al-Aziz – Fall of Fatimids.

UNIT-III

Spain – Abdul Rahaman III – Spain Under the Arabs – Art, Architecture and Literature and Civilization in Moorish Spain – Cordova and Granada.

UNIT-IV

Islamic Civilization : Contribution to Science – Medicine, Astronomy and Mathematics – Chemistry and Ophthalmology – Famous Muslim Scientists.

UNIT-V

Art and Architecture – Literature and Philosophy – History, Historiography and Geography – Theology and Mysticism.

Books for Reference

1. Abbas: Civilization of Islam, Reference Press, New Delhi, 2005.
2. Ali, Syed Ameer: The Spirit of Islam, Idarah-i-Adabiyat-i-Delli, New Delhi, 1997.
3. Ali, Syed Amir : A Short History of the Saracens, Kitab Bhavan, New Delhi, 1995.
4. Arnold, Thomas: The Legacy of Islam, Oxford University Press, 1980.
5. Hitti, Phillip.K: History of Arabs, Macmillan India, New Delhi, 1974.
6. Zaydan, Jurji,: History of Islamic Civilization, Kitab Bhavan, New Delhi, 1978.

PAPER - 4

C. FUNDAMENTALS OF NATIONAL SECURITY

Objective

To develop a special subject knowledge on the vital concept of National Security - and the approaches to achieve National Security (Special reference to India).

UNIT-I

Introduction

- a. Definition, Scope and Features of the concept of National Security
- b. Concept of National Power - elements of national power (tangible and intangible).
- c. Fundamental factors-values-goals and policies that determine National Security.

UNIT-II

Foreign policy & Defence policy

- a. Definition -meaning- scope of foreign policy and defence policy.
- b. Determinants of foreign policy and defence policy.
- c. Instruments of foreign policy and defence policy - Diplomacy and defence.

UNIT -III

Approaches to National Security

- a. Coercive and non-coercive approach-meaning and scope
- b. Coercive means-threats-threat perception and defence apparatus - armed forces -its organization and functions (India).
- c. Non - coercive means - peace mechanics - peace making; peace building.

UNIT -IV

Strategic Environment - India

- a. Feature of strategic environment - its scope in policy making
- b. India's strategic environment - immediate neighbors - adjacent regions - Indian Ocean and global structure.
- c. India's Military preparedness-Defence budget- force structure and organization

UNIT -V

India's strategic relationship (Salient Features)

- a. India - Pakistan Politics-Strategic relations
- b. India - China politics - Strategic relations
- c. India and World powers.

THIRUVALLUVAR UNIVERSITY

MASTER OF ARTS

DEGREE COURSE

M.A. TAMIL

UNDER CBCS

(With effect from 2017– 2018)

The Course of Study and the Scheme of Examination

| Sl. No. | Study Components | | ins. hrs / week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------------------|---------|-----------------|--------|--|---------------|-----------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | |
| 1 | MAIN | Paper-1 | 6 | 5 | இக்கால இலக்கியம் | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | அற இலக்கியம் | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 6 | 4 | தொல்காப்பியம் - எழுத்ததிகாரம் | 25 | 75 | 100 |
| 4 | MAIN | Paper-4 | 6 | 4 | பொது மொழியியல் | 25 | 75 | 100 |
| 5 | ELECTIVE | Paper-1 | 6 | 3 | (பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. தமிழ்ப் பண்பாட்டு வரலாறு 2. ஒப்பிலக்கியம் 3. ஆட்சித்தமிழ் 4. கோயிற்கலையும் பண்பாடும் ஆட்சியும் 5. மொழிபெயர்ப்பியல் | 25 | 75 | 100 |
| | | | 30 | 21 | | 125 | 375 | 500 |
| | | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni. Exam | Total |
| 6 | MAIN | Paper-5 | 6 | 5 | காப்பியங்கள் | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 6 | 5 | பக்தி இலக்கியம் | 25 | 75 | 100 |
| 8 | MAIN | Paper-7 | 5 | 4 | தொல்காப்பியம் சொல்லதிகாரம் | 25 | 75 | 100 |
| 9 | MAIN | Paper-8 | 5 | 4 | இலக்கியத் திறனாய்வும் கொள்கைகளும் | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 11 | ELECTIVE | Paper-2 | 6 | 3 | (பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. தமிழ்மொழி வரலாறு 2. பெண்ணியம் 3. சைவ சித்தாந்தம் 4. தமிழும் கிறித்தவமும் 5. இசுலாமியத் தமிழிலக்கிய வகைகள் | 25 | 75 | 100 |
| | | | 30 | 23 | | 150 | 450 | 600 |

| S. No. | Study Components | | ins. hrs / week | Credit | Title of the Paper | Maximum Marks | | |
|--------------|------------------|----------|-----------------|--------|--|---------------|-----------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER III | | | | | | | | |
| 12 | MAIN | Paper-9 | 6 | 5 | சிறுநிலக்கியம் | 25 | 75 | 100 |
| 13 | MAIN | Paper-10 | 6 | 5 | ஆராய்ச்சி நெறிமுறைகள் | 25 | 75 | 100 |
| 14 | MAIN | Paper-11 | 6 | 5 | தொல்காப்பியம் - பொருளதிகாரம் - I | 25 | 75 | 100 |
| 15 | MAIN | Paper-12 | 6 | 5 | உரையியல் | 25 | 75 | 100 |
| 16 | ELECTIVE | Paper-3 | 6 | 3 | (பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. தமிழ் இலக்கண வரலாறு 2. தொல்லியல் 3. நாட்டார் வழக்காற்றியல் 4. ஒப்பீட்டு நோக்கில் உலகச் செம்மொழிகள் 5.இந்திய தத்துவங்கள் | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| | | | | | | | | |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 17 | MAIN | Paper-13 | 6 | 5 | சங்க இலக்கியம் | 25 | 75 | 100 |
| 18 | MAIN | Paper-14 | 6 | 5 | அகராதியியல் | 25 | 75 | 100 |
| 19 | MAIN | Paper-15 | 5 | 5 | தொல்காப்பியம் - பொருளதிகாரம் - II | 25 | 75 | 100 |
| 20 | MAIN | Paper-16 | 5 | 5 | பதிப்பியல் (அ) ஆய்வேடு | 25 | 75 | 100 |
| 21 | ELECTIVE | Paper-4 | 6 | 3 | (பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. தமிழர் மானிடவியல் 2. திருவள்ளுவம் 3. கணினித்தமிழ் 4. படைப்பாக்கமும் ஆளுமைத் திறனும் 5. இந்திய இலக்கியப் பொதுக்கூறுகள் | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |

திருவள்ளூர் பல்கலைக்கழகம்

முதுகலை : தமிழியல்

நடைமுறை : 2017-2018

முதலாம் ஆண்டு

முதற் பருவம்

தாள் I

இக்கால இலக்கியம் I

கூறு 1 : கவிதை

1. பாரதியார் : கண்ணன் என் தோழன்

2. பாரதிதாசனார் : எந்நாளோ?

3. கொங்குதேர் வாழ்க்கை, தொகுதி 2 – ராஜ மார்த்தாண்டன்

(தமிழினி, சென்னை) தொகுப்பில் இடம்பெற்றுள்ள கீழ்க்கண்ட கவிதைகள்

| | |
|---|---|
| ந. பிச்சமுர்த்தி – காலண்டர் (ப.16), | பசுவையா – விருட்சமனிதர்கள் (ப.35) , |
| எஸ். வைத்தீஸ்வரன் - ஒன்ஸ்மோர் (ப. 68) | அபி - இந்த அறையில் (ப. 88), |
| ஞானக்கூத்தன் - அம்மாவின் பொய்கள் (ப.89,90), | கலாப்பிரியா - ஸ்நேகிதனின் தாழ்வான வீடு (ப.123,124), |
| தேவதேவன் - இயற்கை (138), | தேவதச்சன் - ஆண்டாள் என் பள்ளித் தோழி (ப. 147) |
| ஆத்மாநாம் - காரணம் (ப.182), | விக்ரமதித்யன் - பொருள்வயிற்பிரிவு (ப. 189), |
| சுகுமாறன் - பாட்டி மணம் (ப.212,213) , | மனுஷ்ய புத்திரன் - இழை (ப. 239) |
| உமா மகேஸ்வரி – எனது நதி (ப. 245) | ரமேஷ் & பிரேம் - அந்தரநதி (ப. 264), |
| யூமா வாசுகி – மாலை நேர வீடு (ப.280) | கரிகாலன் - களவொழுக்கம் (ப.308) , |
| சூத்தரதாரி – புதையாத புன்னகை (ப.333) , | பச்சியப்பன் - இல்வாழ்க்கை (ப. 336), |
| அழகிய பெரியவன் - கண்ணாடியுள் அப்பா (353), | சல்மா - இருட்டேர் (ப.367), |
| குட்டி ரேவதி – தாகம் (ப. 370) | சங்கர ராமசுப்பிரமணியன் - வீடு (ப.390) |
| ஜே. பிரான்ஸிஸ் கிருபா – தீயின் இறகு (ப. 399), | மாலதி மைத்ரி – யானைக் கதை (ப. 405), |
| சுகிர்தராணி – பாலய மொழி (ப. 436,37) | |

கூறு 2 : புதினம்

நெடுஞ்சாலை- கண்மணி குணசேகரன்

தமிழினி பதிப்பகம், இராயப்பேட்டை, சென்னை- 14.

கூறு 3 : சிறுகதை

தமிழ்ச் சிறுகதைகள் (தொகுதி .2)

தொகுப்பு : அகிலன்,

443, அண்ணாசாலை, தேனாம்பேட்டை, சென்னை-18. பதிப்பு ஆண்டு: 2012.

கூறு 4 : நாடகம்

கால எந்திரம் - இந்திரா பார்த்தசாரதி,

இந்திரா பார்த்தசாரதி நாடகங்கள், காலச்சுவடு பதிப்பகம்,

நாகர்கோயில்.

கூறு 5 : கட்டுரை

தமிழ்க் கட்டுரைக் களஞ்சியம் : 1 முதல் 20 வரையிலான கட்டுரைகள்
தொகுப்பாசிரியர் : இரா. மோகன்,
443, அண்ணாசாலை, தேனாம்பேட்டை, சென்னை-18. பதிப்பு ஆண்டு: 2009.

பார்வை நூல்கள் :

1. இரா. வல்லிக்கண்ணன் : புதுக்கவிதை தோற்றமும் வளர்ச்சியும்,
எழுத்து பிரசுரம், திருவல்லிக்கேணி, சென்னை-5.
2. பாலா : புதுக்கவிதை ஒரு புதுப்பார்வை,
அகரம், நிர்மலா நகர், தஞ்சாவூர் - 613 001,
2006.
3. மன்னர் மன்னன் : கறுப்புக்குயிலின் நெருப்புக்குரல்,
முத்துப் பதிப்பகம், விழுப்புரம் - 605 602,
1985.
4. நிர்மலா சுரேஷ் : தமிழில் ஹைக்கூ கவிதைகள்,
திருமகள் நிலையம், தி.நகர்,
சென்னை-17,
1981.
5. நா. வானமாமலை : புதுக்கவிதை – முற்போக்கும் பிற்போக்கும்,
மக்கள் வெளியீடு, எல்லீசு சாலை,
சென்னை - 600 002.
6. ந. சுப்புரெட்டியார் : புதுக்கவிதை போக்கும் நோக்கும்,
பாரி நிலையம்,
சென்னை-1,
1983.
7. ஜெயமோகன் : நவீனத் தமிழிலக்கிய அறிமுகம்,
உயிர்மை பதிப்பகம், அபிராமபுரம்,
சென்னை-18,
1995.
8. மா. இராமலிங்கம் : இருபதாம் நூற்றாண்டுத் தமிழ் உரைநடை,
தமிழ்ப் புத்தகாலயம்,
தி.நகர்,
சென்னை - 17.
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தமிழ்ப் புத்தகாலயம்,
தி.நகர், சென்னை-17.
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கிரியா பதிப்பகம், திருவான்மியூர்,
சென்னை - 41.
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தரமணி, சென்னை - 113.
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அன்னம் பதிப்பகம்,
சென்னை.
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1979.
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மைதிலி பதிப்பகம்,
எட்டாவது முதன்மைச் சாலை,
அண்ணா நகர், சென்னை - 40.

தாள் II அற இலக்கியம்

- கூறு 1 : திருக்குறள் - அறத்துப்பால் : 11 – 15 அதிகாரம்
பொருட்பால் : 46 – 50 அதிகாரம்
இன்பத்துப்பால் : 121 – 125 அதிகாரம்
- நாலடியார் - 1 முதல் 3 அதிகாரங்கள் (1 – 30)
- கூறு 2 : திரிகடுகம் - 11 – 20 பாடல்கள்
ஆசாரக்கோவை- 16 – 30 பாடல்கள்
பழமொழி நானூறு- 51 – 60 பாடல்கள் (இயல்பகை முதல் ஆற்றும் வரை)
- (கழகவெளியீடு.)
- கூறு 3 : மூதுரை- முழுவதும்
நீதிவெண்பா - 1-15 பாடல்கள்
- கூறு 4 : சிவப்பிரகாசர் –நன்னெறி (1-20 பாடல்கள்)
குமரகுருபரர் –நீதிநெறி விளக்கம் (1-20 பாடல்கள்)
- கூறு 5 : குருபாததாசன் - குமரேச சதகம் (21-30 பாடல்கள்)
(குருவிலா முதல் கல்லினால் வரை)
- ஜெகவீரபாண்டியனார் - திருக்குறட் குமரேசவெண்பா- அறத்துப்பால்-
வாய்மை (291-300 பாடல்கள்)

பார்வை நூல்கள் :

1. ச.வே. சுப்பிரமணியன் (ப.ஆ) : பதினெண்கீழ்க்கணக்கு நூல்கள்,
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தமிழ்க்கோட்டம்,
அமைந்தகரை, சென்னை-29.
3. க.ப. அறவாணன் : திருவள்ளுவம்,
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அமைந்தகரை, சென்னை-29.
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தமிழ்ப்பிரியன் (உ.ஆ) : நீதிநூல் களஞ்சியம்,
கற்பகம் புத்தகாலயம், தி.நகர்,
சென்னை-17.
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சென்னைப் பல்கலைக்கழகம்,

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முதற்பதிப்பு, 1971.

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மயிலம் பொம்மபுர ஆதீன வெளியீடு,
மயிலம் - 604 304, திண்டிவனம் வட்டம்,
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கழக வெளியீடு, சென்னை-1,
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அறத்துப்பால், தொகுதி-3,
தமிழ் நிலையம், தி.நகர்,
சென்னை-17,
2009.
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இந்து பதிப்பகம்,
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இளங்கோ புத்தக சாலை,
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1978.

தாள் III தொல்காப்பியம் - எழுத்ததிகாரம்

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| கூறு | 1 | : | நூல்மரபு, மொழிமரபு, பிறப்பியல் |
| கூறு | 2 | : | புணரியல், தொகைமரபு |
| கூறு | 3 | : | உருபியல், உயிர் மயங்கியல் |
| கூறு | 4 | : | புள்ளி மயங்கியல் |
| கூறு | 5 | : | குற்றியலுகரப் புணரியல் |

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5. தி. முருகரத்தினம் : தமிழ் எழுத்தியல் அன்றும் இன்றும், மதுரைப் பல்கலைக்கழகம், சர்வோதய இலக்கியப் பண்ணை, மதுரை-625 001.
6. ச. பாலசுந்தரனார் : தொல்காப்பியம் - எழுத்ததிகாரம் - ஆராய்ச்சிக் காண்டிகையுரை, பெ. மாதையன் (ப.ஆ), பெரியார் பல்கலைக்கழகம், சேலம் - 636 011, 2014.
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10. வ.சுப. மாணிக்கம் : தொல்காப்பியக் கடல், மணிவாசகர் பதிப்பகம், சிதம்பரம், 1987.

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12. க. வெள்ளைவாரணன் : தமிழ் இலக்கிய வரலாறு - தொல்காப்பியம், அண்ணாமலைப் பல்கலைக்கழகம், சிதம்பரம், 1970.
13. செ.வை. சண்முகம் : எழுத்திலக்கணக் கோட்பாடு, அனைத்திந்திய மொழியியல் கழகம், அண்ணாமலைநகர், 1980.
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17. க.ப. அறவாணன் : தொல்காப்பியக் களஞ்சியம், பாரி நிலையம், சென்னை, 1975.
18. ச. அகத்தியலிங்கம் : தொல்காப்பிய உருவாக்கம், மெய்யப்பன் தமிழாய்வகம், சிதம்பரம், 2001.
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20. ச. பாலசுந்தரம் : எழுத்திலக்கணக் கலைச்சொற் பொருள்விளக்க அகராதி, தாமரை வெளியீட்டகம், 367, மேலவீதி, தஞ்சாவூர் - 631 009, 1998.
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தாள் IV
பொது மொழியியல்

- கூறு 1 : **மொழியியலும் மொழியியல் சார்ந்த விளக்கங்களும்**
- மொழி - வரையறை - விளக்கம் - மொழியியல் பற்றிய சொல் பொருள் விளக்கம், மொழியியல் பிரிவுகள், மொழி - பேச்சு மற்றும் எழுத்து முறைகள், மொழியின் கட்டமைப்பு.
- கூறு 2 : **ஒலியியலும், ஒலியனியலும்**
- ஒலியியல் விளக்கம் - பிரிவுகள் - பேச்சு உறுப்புகள் - பேச்சொலி வகைப்பாடு - இணையொலிப்பு, ஒலியனியல் - வரையறை - விளக்கம் - ஒலி - ஒலியன் - மாற்றொலி, ஒலியன் கோட்பாடுகள் - மேற்கூற்றொலியன்.
- கூறு 3 : **உருபனியல்**
- உருபனியல் - வரையறை - விளக்கம் - உருபன் - உருபு - மாற்றுருபு - நைடாவின் உருபனைக் கண்டறியும் கொள்கைகள் - உருபன் வகைகள் - உருபு வகைகள்.
- கூறு 4 : **தொடரியல்**
- தொடரியல் - வரையறை - சொல் வகைகள் - அண்மையுறுப்பு - விளக்கம் - அண்மையுறுப்பு வகைகள் - தொடரமைப்பு - மாற்றிலக்கணக் கோட்பாடு - அகவடிவம், புறவடிவம்.
- கூறு 5 : **பொருண்மையியல்**
- பொருள் வகைகள் - சொற்பொருள் மற்றும் இலக்கணப் பொருள், சொற்பொருள் அலகுகள் - சுட்டுப் பொருள், குறிப்புப் பொருள் - ஒருபொருட் பன்மொழி - பல பொருள் குறித்த ஒரு சொல், ஒலியமைப்பில் ஒத்த பொருள் மாறுபடும் சொற்கள்.

பார்வை நூல்கள் :

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விருப்பப்பாடம்

1. தமிழ்ப் பண்பாட்டு வரலாறு

- கூறு 1 : வரலாற்றுக்கு முந்தைய காலம் : பழைய கற்காலம் - புதிய கற்காலம் - சிந்துவெளி மனித இனவளர்ச்சி - கலைகள் உருவாக்கம் - பண்பாட்டு வரலாறு - சங்ககாலம்.
- கூறு 2 : தமிழர்நிலை : களப்பிரர் காலம் - பல்லவர் காலம் - சோழர் காலம் - பாண்டியர் காலம் - நாயக்கர் காலம் - நவாபுகள் காலம் - ஐரோப்பியர்காலம்.
- கூறு 3 : நீதி இலக்கியம் - சமய மரபு - நீதி, அறம் வடமொழித் தாக்கங்கள் - பக்தி இலக்கியம் - பண்பாட்டுப் பரவல் - பண்பாட்டுச் சேர்க்கை - பக்தி வழி உருவான பண்பாட்டுத் தன்மைகள்.
- கூறு 4 : நுண்கலைகள் - இசை - ஓவியம் - சிற்பம் - கட்டடம் - பண்பாட்டுக் கூறுகளைக் காணல் - காலந்தோறும் நுண்கலைகள் - வரலாற்றுப் போக்கில் நுண்கலைகள் வழி வெளிப்படும் பண்பாட்டுக் கூறுகளைக் கண்டறிதல்.
- கூறு 5 : இருபதாம் நூற்றாண்டில் ஊடகங்கள் வழிப் பண்பாட்டைக் காணுதல் -வாய்மொழி - அச்சு - பார்த்தலும் கேட்டலும்.

பார்வை நூல்கள் :

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அண்ணாமலைப் பல்கலைக்கழக வெளியீடு,
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விருப்பப்பாடம் 2. ஒப்பிலக்கியம்

- கூறு 1 : ஒப்பிலக்கியம் : வரையறை, விளக்கம் - மேனாடுகளில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - இந்தியாவில், தமிழகத்தில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - தமிழில் ஒப்பிலக்கியப் போக்குகள், சிந்தனைகள், பயன்பாடுகள்.
- கூறு 2 : நான்கு வகை இலக்கியப் பார்வைகள் - தேசிய இலக்கியம் - உலக இலக்கியம் - பொதுமை இலக்கியம் - ஒப்பிலக்கியம் - இலக்கிய வகைப்பாடுகள் - இலக்கிய ஒப்பீடு - வரலாற்று ஒப்பீடு - மொழி ஒப்பீடு.
- கூறு 3 : ஒப்பிலக்கியக் கோட்பாடுகள் - பிரெஞ்சுக் கோட்பாடு - அமெரிக்கக் கோட்பாடு - ஒப்பிலக்கிய அறிவியல் ஆய்வு நெறிமுறைக் கோட்பாடுகள் - இணைவரை - ஏற்பு - தாக்கம் - செல்வாக்குப் பாலங்கள் - இலக்கிய வரலாறு - இலக்கிய வகைமை - அடிக்கருத்தியல் - மொழிபெயர்ப்பு.
- கூறு 4 : ஒப்பாய்வுக் களங்கள் - நாட்டுப் புறமும் ஏட்டிலக்கியமும் - இலக்கியமும் நுண்கலைகளும் - இலக்கியமும் உளவியலும் - இலக்கியமும் பிறதுறைகளும் - இலக்கியமும் சமுதாயமும்.
- கூறு 5 : வீரயுகப் பாடல்கள் - தன்னுணர்ச்சிப் பாடல்கள் - இயற்கைப் புனைவுப் பாடல்கள் - முல்லைப் பாடல்கள்

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பதிப்புத்துறை,
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விருப்பப்பாடம்
3. ஆட்சித்தமிழ்

- கூறு 1 : தமிழ் ஆட்சிமொழி வரலாறும் தமிழின் தொன்மையும் சிறப்பும் - ஆட்சிமொழி விளக்கம் - தொல்காப்பியர் காலம் முதல் இன்றுவரை ஏற்பட்ட ஆட்சி மொழி மாற்றங்கள் - தமிழை ஆட்சி மொழியாக்கத் தனிப்பட்டோர் முயற்சிகள் - அமைப்புகளின் முயற்சிகள்.
- கூறு 2 : விடுதலைப் போராட்டச் சூழல் - அரசாணைகள் - கடிதங்கள் - குறிப்பாணைகள்.
- கூறு 3 : ஆட்சி மொழிக்குழு ஆட்சி மொழித்திட்ட நிறைவேற்ற நிலைகள் - தமிழ் வளர்ச்சித் திட்டங்களும் பணிகளும் - அகவை முதிர்ந்த தமிழறிஞர் நிதியுதவித் திட்டம் - மொழிக் காவலர் நிதியுதவித் திட்டம் - சிறந்த தமிழ் நூல்களுக்குப் பரிசு வழங்கும் திட்டம்.
- கூறு 4 : ஆட்சிமொழித் திட்டச் செயலாக்கத்தில் சிறந்து விளங்கும் அலுவலகங்களுக்குப் பரிசுக் கேடயமும், பாராட்டுரையும் வழங்கும் திட்டம் - தமிழ்த்திட்டச் செயலாக்கத்தில் ஊக்கமும், ஆக்கமும் பரிசு வழங்கும் திட்டம்.
- கூறு 5 : தமிழ் வளர்ச்சிக்கான சிறந்த நூல்களை வெளியிடுவதற்கு நிதியுதவி வழங்கும் திட்டம் முதல் நூல்கள் நாட்டுடைமையாக்கல் வரை.

பாட நூல் : ஆட்சித் தமிழ் - ச. நாகராஜன், தமிழ் வளர்ச்சி இயக்கக வெளியீடு.

(குறிப்பு : வினாக்கள் பாட நூலிலிருந்து கேட்கப்படல் வேண்டும்.)

பார்வை நூல்கள் :

1. க. பட்டாபிராமன் : ஆட்சித்தமிழ்
2. க. பட்டாபிராமன் : ஆட்சித்தமிழ் அகராதி

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விருப்பப்பாடம்

4. கோயிற்கலையும் பண்பாடும் ஆட்சியும்

- கூறு 1 : கோயில் - சொல் விளக்கம் - பண்டை இலக்கியங்களில் கோயில் என்னும் சொல் இடம் பெற்றமை - கோயிற்கலையின் தோற்றம் - வளர்ச்சி - கட்டடக்கலையின் வளர்ச்சி.
- கூறு 2 : சேர, சோழ, பாண்டியர்களின் கோயில் அமைப்புகள் - பிற்காலச் சோழர் கோயிற்கலை - பிற்காலப் பாண்டியர் கோயிற்கலை விசயநகரப் பேரரசு காலக் கோயில்கள், இக்காலக் கோயிற்கலை.
- கூறு 3 : கோயிலை ஒட்டி வளர்ந்த தெய்வீகப் பண்பாட்டின் பொதுக் கூறுகள் - சமூகப் பொது வழிபாட்டின் சிறப்பு - இசை - நடனம் - ஓவியம் - சிற்பம் முதலிய கலைகளின் வளர்ச்சி - தல புராணங்கள் இவற்றால் அறியப்படும் நாகரிகம், பண்பாடுகள்.
- கூறு 4 : திருவிழாக்கள் - அவற்றிற்குரிய அறக்கட்டளைகள் - வழிபாட்டுக்குரிய விதிமுறைகள் - மன்னர்களும் மக்களும் அளித்த அறக்கட்டளைகள் - அவற்றை மேற்பார்வையிடும் முறைகள் - கோயிலைச் சார்ந்த நிலங்களும் பொருள்களும் - அலுவலர்கள் - ஊதியம், இறையிலி, நிலங்கள் அளித்தமை.
- கூறு 5 : பொது நிர்வாகம் - மன்னர்கள் நிர்வாகம் - ஊர் நிர்வாகம் - சிலைகள் - உலோகச் சிலைகள் - பிற சிலைகள் - பாதுகாத்தல் - பூசனைப் பொருள்கள் - அவற்றைப் பாதுகாத்தல் - பெருந்தெய்வம் - சிறுதெய்வம் - வழிபாட்டில் வேறுபாடு.

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6. கே.கே. பிள்ளை : தமிழக வரலாறும் பண்பாடும், உலகத் தமிழாராய்ச்சி நிறுவனம்,

தரமணி, சென்னை-113,
2004.

7. மயிலை சீனி. வேங்கடசாமி : மகாபலிபுரத்தின் சமணச் சிற்பங்கள், தமிழ்நாடு ஜைன சங்கம்.
8. அ. தட்சிணாமூர்த்தி : தமிழர் நாகரிகமும் பண்பாடும், ஐந்திணைப் பதிப்பகம், சென்னை-35, முதற்பதிப்பு, 1987.
9. மயிலை சீனி. வேங்கடசாமி : தமிழர் வளர்த்த அழகுக் கலைகள், மணிவாசகர் பதிப்பகம், சென்னை-1, நான்காம் பதிப்பு, 1989.
10. மயிலை சீனி. வேங்கடசாமி : நுண்கலைகள், வசந்தா பதிப்பகம், சென்னை-88, முதற்பதிப்பு, 2003.
11. மயிலை சீனி. வேங்கடசாமி : இறைவன் ஆடிய எழுவகைத் தாண்டவம், வசந்தா பதிப்பகம், சென்னை-88, முதற்பதிப்பு, 2003.
12. மயிலை சீனி. வேங்கடசாமி : பழங்காலத் தமிழரசர்கள், வசந்தா பதிப்பகம், சென்னை-88, முதற்பதிப்பு, 2003.

விருப்பப்பாடம்

5. மொழிபெயர்ப்பியல்

- கூறு 1 : மொழிபெயர்ப்பு - விளக்கம் - மொழிபெயர்ப்பின் நோக்கம், மொழிபெயர்ப்பின் முறை - மொழிபெயர்ப்பின் பயன் - மொழிபெயர்ப்பாளரின் தகுதிகள் - உடனடி மொழிபெயர்ப்பு (கணிப்பொறி வழி மொழிபெயர்ப்பு)
- கூறு 2 : தமிழ் மொழிபெயர்ப்பு வரலாறு - தொன்மைக் காலம், இடைக்காலம் - சமணம் - பௌத்தம் - இராமாயணம் - மகாபாரதம் - புராணங்கள் பிற மொழிபெயர்ப்புகள், பிற்காலம்
- கூறு 3 : தற்காலத்தில் மொழிபெயர்ப்புக் கல்வி - இதழ்கள் - நிறுவனங்கள் - உலகத் தமிழ் ஆராய்ச்சி நிறுவனம் - தமிழ்ப் பல்கலைக்கழகம் - சாகித்ய அகாடமி - நேஷனல் புக் டிரஸ்ட் ஆகிய நிறுவனம் - தமிழ்ப் பல்கலைக்கழகம் - தமிழ்நாடு அரசு - தென்னிந்திய மொழிகள் புத்தக டிரஸ்ட் - யுனெஸ்கோ - பதிப்பகங்கள் - மொழிபெயர்ப்பு விமர்சனங்கள் - பொதுநிலை மொழிபெயர்ப்பு நிறுவனங்கள்.
- கூறு 4 : இலக்கிய மொழிபெயர்ப்பு - அறிவியல் மொழிபெயர்ப்பு - மொழிபெயர்ப்புச் சிக்கல்கள்.
- கூறு 5 : மொழிபெயர்ப்புப் பயிற்சி (ஆங்கிலத்திலிருந்து)

பாடநூல் : சேதுமணி மணியன் - மொழிபெயர்ப்பியல் கோட்பாடுகளும் உத்திகளும் செண்பகம் வெளியீடு, மதுரை-625 002, 2001.

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3. சண்முக வேலாயுதம் : மொழிபெயர்ப்பியல் உலகத் தமிழாராய்ச்சி நிறுவனம், தரமணி, சென்னை-113, பதிப்பு, 1985.
4. மு. வளர்மதி : மொழிபெயர்ப்புக் கலை, திருமகள் நிலையம், சென்னை-17, 2008.
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6. ந. முருகேசபாண்டியன் : தமிழ் மொழிபெயர்ப்பில் உலக இலக்கியம், தி பார்க்கர், இராயப்பேட்டை, சென்னை-14, 2014.

**முதலாம் ஆண்டு
இரண்டாம் பருவம்
தாள் V
காப்பியங்கள்**

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| கூறு 1 | : | சிலப்பதிகாரம் : | மதுரைக்காண்டம் - 5 காதைகள் (16. கொலைக்களக் காதை முதல் 20. வழக்குரை காதை வரை) |
| | | மணிமேகலை : | 3 காதைகள் (15. பாத்திரம் கொண்டு பிச்சை புக்க காதை, 16. ஆதிரை பிச்சையிட்ட காதை, 17. உலக அறவி புக்க காதை) |
| கூறு 2 | : | பெரியபுராணம் : | அப்பூதியடிகள் நாயனார் புராணம் |
| கூறு 3 | : | கம்பராமாயணம் : | சுந்தர காண்டம் - சூடாமணிப் படலம் |
| கூறு 4 | : | தேம்பாவணி : | முதற்காண்டம் - வளன் சனித்த படலம் |
| கூறு 5 | : | சீறாப்புராணம் : | நுபுவந்துக் காண்டம் - மானுக்குப் பிணைநின்ற படலம் |

பார்வை நூல்கள் :

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| 1. | வ.சுப. மாணிக்கம் | : | இரட்டைக் காப்பியங்கள், செல்லப்பா பதிப்பகம், மீனாட்சி புத்தக நிலையம் (விற்பனை உரிமை), மதுரை-625 001, 2007. |
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| 3. | தெ.பொ. மீனாட்சி சுந்தரனார் | : | குடிமக்கள் காப்பியம், மீனாட்சி புத்தக நிலையம், மதுரை-625 001, 1974. |
| 4. | அ.ச. ஞானசம்பந்தன் | : | கம்பன் - புதிய பார்வை, கம்பன் கழக வெளியீடு, வானதி பதிப்பகம், தி. நகர், சென்னை-17, 1984. |
| 5. | கி.வா. ஜகந்நாதன் | : | தமிழ்க் காப்பியங்கள், அமுத நிலையம், இராயப்பேட்டை ஹைரோடு, சென்னை-14, 1971. |

தாள் VI
பக்தி இலக்கியம்

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| கூறு | 1 | : | 1) திருஞானசம்பந்தர் தேவாரம் | - | உண்ணாமுலை உமையாளோடும் - முதல்திருமுறை - திருவண்ணாமலைப் பதிகம். (1-11 பாடல்கள்) |
| | | | 2) திருநாவுக்கரசர் தேவாரம் | - | மாசில் வீணையும் - ஐந்தாம் திருமுறை - தனித்திருக்குறுந்தொகை (1-10 பாடல்கள்) |
| | | | 3) சுந்தரர் தேவாரம் | - | அந்தணாளன் உன் அடைக்கலம் புகுத - ஏழாம் திருமுறை - திருப்பஞ்சுரத் திருப்பதிகம் (1-10 பாடல்கள்) |
| | | | 4) மாணிக்கவாசகர் | - | திருவாசகம் - திருச்சாழல் (1-10 பாடல்கள்) |
| கூறு | 2 | : | 1) நம்மாழ்வார் | - | திருவாய்மொழி - 'முந்நீர் ஞாலம்' பாசரம் (1-11 பாடல்கள்) |
| | | | 2) திருமங்கையாழ்வார் | - | பெரிய திருமொழி - 'தாயே தந்தை என்றும்' பாசரம் (1-10 பாடல்கள்) |
| | | | 3) ஆண்டாள் | - | நாச்சியார் திருமொழி 'கருப்பூரம் நானுமோ' பாசரம் (1-10 பாடல்கள்) |
| | | | 4) பிள்ளைப்பெருமாள் ஐயங்கார் | - | அஷ்ட பிரபந்தம் திருவேங்கடத்தந்தாதி (1-10 பாடல்கள்) |
| கூறு | 3 | : | 1) திருமூலர் | - | திருமந்திரம் - எட்டாம் தந்திரம் பத்தியுடைமை (1-10 பாடல்கள்) |
| | | | 2) அருணகிரிநாதர் | - | கந்தர் அனுபூதி (1 முதல் 25 பாடல்கள்) |
| | | | 3) சிவப்பிரகாசர் | - | நால்வர் நான்மணிமாலை (1 - 8 பாடல்கள்) |
| | | | 4) வள்ளலார் | - | திருவருட்பா - ஆறாம் திருமுறை மரணமிலாப் பெருவாழ்வு, (1-10 பாடல்கள்) |
| கூறு | 4 | : | எச்.ஏ. கிருட்டினப்பிள்ளை | - | இரட்சணிய மனோகரம் 1. பால்ய பிரார்த்தனை (1-20) 2. அடியார்களின் ஒழுக்கம்(1-10) 3. திருநாமப் பதிகம்(1-11) 4. சீவ வாக்கு(1-10) |

கூறு 5 : குணங்குடி மஸ்தான் சாகிபு - குணங்குடி மஸ்தான் சாகிபு
பாடல்கள்
1) அகத்தீசர் சதகம் (1-10
பாடல்கள்)
2) ஆனந்தக் களிப்பு

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இரண்டு தொகுதிகள்,
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அண்ணாமலை நகர்.

தாள் VII
தொல்காப்பியம் - சொல்லதிகாரம்

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| கூறு 1 | : | கிளவியாக்கம், வேற்றுமையியல் |
| கூறு 2 | : | வேற்றுமை மயங்கியல், விளிமரபு |
| கூறு 3 | : | பெயரியல், வினையியல் |
| கூறு 4 | : | இடையியல், உரியியல் |
| கூறு 5 | : | எச்சவியல் |

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தாள் VIII

இலக்கியத்திறனாய்வுகளும் கொள்கைகளும்

- கூறு 1 : திறனாய்வு விளக்கம் - பயன் - திறனாய்வாளன் - திறனாய்வாளனின் பண்புகள் - திறனாய்வாளனின் மதிப்பீடு - இலக்கியக் கலை - இலக்கியத்தில் உணர்ச்சி - தமிழ் மரபுவழித் திறனாய்வு - தொல்காப்பியரின் திறனாய்வுக் கொள்கைகள் - உரையாசிரியர்களின் திறனாய்வுப் பார்வைகள் - கற்பனை - வடிவம் - நடை ஒலிநயம் - கலை கலைக்காகவே - படைப்பும் வாழ்க்கையும்.
- கூறு 2 : விளக்கமுறைத் திறனாய்வு - ஒப்பீட்டுமுறைத் திறனாய்வு - அழகியல் திறனாய்வு - பாராட்டுமுறைத் திறனாய்வு - முடிபுமுறைத் திறனாய்வு - விதிமுறைத் திறனாய்வு - பகுப்புமுறைத் திறனாய்வு.
- கூறு 3 : திறனாய்வு அணுகுமுறைகள் - சமுதாயவியல் - வரலாற்றியல் - மார்க்சியம் - உளவியல் - தொல்படிமவியல் - மொழியியல் - கருத்தாடல் - எடுத்துரைப்பியல் - சூழலியல் திறனாய்வு.
- கூறு 4 : ஒப்பிலக்கியம் - தாக்கம் - இணைவரை- செல்வாக்கு - படைப்பு, படைப்பாளன் தொடர்பு - கட்டுடைப்பு - தலித்தியம் - பெண்ணியம் - விளிம்புநிலை - கதையாடல்கள்
- கூறு 5 : அமைப்பியல் - பின் அமைப்பியல் - நவீனத்துவம் - பின் நவீனத்துவம் - புதுத்திறனாய்வு - புதிய வரலாற்றியல் - பின் காலனியம் - தமிழில் நவீனத் திறனாய்வுகள் - நூல்கள் - கட்டுரைகள்.

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விருப்பப்பாடம்

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கூறு 1 : மொழி வரலாற்றுச் சான்றுகள்

இலக்கியங்கள் - இலக்கணங்கள் - உரையாசிரியர்கள் - வெளிநாட்டார் எழுதிய இலக்கணங்கள் - அகராதிகள் - கல்வெட்டுகள் - பிறமொழிக் கல்வெட்டுகள் - அயல்நாட்டார் குறிப்புகள் - கிளைமொழிகள் - தமிழ்ப் பிராமிக் கல்வெட்டுகளின் மொழியமைப்பு - அரிட்டாபட்டி- மருகாந்த மலை - அரிக்கமேடு - திருப்பரங்குன்றம் - கமுகுமலை - சித்தன்னவாசல் - ஆண்டிப்பட்டி முதலிய கல்வெட்டுகளின் மொழியமைப்பு.

கூறு 2 : சங்க காலத் தமிழ்

தொல்காப்பிய அமைப்பிலிருந்து மாறுபடுதல் - எகரம் அகரமாதல் - தன்மைப் பன்மை, ஊகாரம் ஆகாரமாதல் - மூக்கொலி மறைவு, இறந்தகாலம் காட்டும் இடைநிலைகள் - இறப்பில்லா காலம் காட்டும் இடைநிலைகள், தன்மை ஒருமை, தன்மைப் பன்மை, முன்னிலை ஒருமை, முன்னிலைப் பன்மை, படர்க்கை பால் காட்டும் விகுதிகள்.

கூறு 3 : சங்கம் மருவியகாலத் தமிழ்

இலக்கியங்களில் யகரமெய் கெடல், நகரமெய் கெடல், குறில் நெடில் மாறுதல்கள் - தனிக்குறில் நகர / ழகரம், சகர மொழிமுதல், ரகர, யகர, லகரங்கள் மொழிமுதல், ழகர நகரப் புணர்ச்சி, பால்காட்டும் விகுதிகள், இரட்டைப் பன்மை, உயர்வு ஒருமைப் பெயர்கள், பெயர்ப்பதிலி, சுட்டுப் பெயரடைகள், வேற்றுமை உருபுகள், எண்ணுப்பெயர்கள், காலம் காட்டும் கிளவிகள், உண்டு என்ற குறிப்புவினை.

கூறு 4 : பல்லவர், சோழர், பாண்டியர் காலத் தமிழ்

ஒலியன்கள், ஒலி மாற்றங்கள், கள் விகுதிகள், வடமொழிச் செல்வாக்கு, வடசொற்கள் தமிழாதல், ஒலி மாற்றங்கள், பெயர்ப்பதிலிகள், திசை காட்டும் சொற்கள், கள் விகுதிகள், வேற்றுமை, ஏவல் வினைகள், எச்சங்கள், நிபந்தனை எச்சம்.

கூறு 5 : தற்காலத் தமிழ்

பேச்சுத்தமிழ் ஒலியன்களும் ஒலி மாற்றங்களும், உயர்வு ஒருமைப் பெயர்கள், முன்னிலைப் பன்மை வடிவங்கள், பெயர்ப்பாகுபாடுகள், வினை வடிவங்கள், அறிவியல், வானொலி, பத்திரிகை, தொலைக்காட்சி, மேடை, பண்பலை ஆகியவற்றில் தமிழில் பிறமொழிக் கலப்பு, தமிழ்ச் சொற்களில் ஏற்பட்டுள்ள மாற்றங்கள்.

பாட நூல் : தமிழ்மொழி வரலாறு - சு. சக்திவேல், மணிவாசகர் பதிப்பகம், சென்னை-108.

பார்வை நூல்கள் :

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2. டாக்டர் மு. வரதராசனார் : மொழிநூல்,
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5. டாக்டர் முத்துச் சண்முகம் : இக்காலத் தமிழ்,
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சென்னை-5. 2011.
8. கு. பரமசிவம் : இக்காலத் தமிழ்மரபு
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சென்னை-5. 2011.

விருப்பப்பாடம்

2. பெண்ணியம்

- கூறு 1 : பெண்ணிய விளக்கம் - மேலை நாடுகளில் பெண்ணியம் - பெண்களுக்கு வாக்குரிமை - பெண் விடுதலை இயக்கம்.
- கூறு 2 : பெண்ணியக் கோட்பாடுகள் - பெண்ணடிமையின் காரணங்கள், பெண்கள் முன்னேற்ற வழிகள் - மிதவாதப் பெண்ணியம் - மாக்கியப் பெண்ணியம் - சோஷலிசப் பெண்ணியம் - தீவிரவாதப் பெண்ணியம் - ஆன்மீகப் பெண்ணியம் - கலாச்சாரப் பெண்ணியம் - கிறித்துவப் பெண்ணியம் - இந்தியப் பெண்ணியம் - பெரியார் பெண்ணியம்.
- கூறு 3 : பெண்ணியம் - இந்தியாவில் தோற்றமும் வளர்ச்சியும் - காலந்தோறும் பெண்மை - பெண்களும் சட்டங்களும் - பெண்களும் அரசுத் திட்டங்களும் - மகளிர் அமைப்புகள்.
- கூறு 4 : தமிழிலக்கிய நோக்கில் பெண்கள் - மரபு இலக்கியத்தில் பெண்கள் - பாரதி படைப்புகளில் பெண்ணியம் - பெண் சிறுகதை ஆசிரியர்கள் - பெண் நாவலாசிரியர் - பெண் புதுக்கவிஞர்கள் - மகளிர் இதழ்கள்.
- கூறு 5 : இலக்கியமும் மகளிர் மேம்பாடும் - பெண்ணியப் படைப்புகளில் விமர்சனப் பார்வை - பின் நவீனத்துவப் பார்வையில் பெண்ணியம்.

பார்வை நூல்கள் :

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விருப்பப்பாடம் 3. சைவ சித்தாந்தம்

- கூறு 1 : சைவத்தின் தொன்மை வரலாறு - மொகஞ்சதாரோ ஹரப்பா தடயங்கள் - வேதத்தில் சைவம் - உபநிடத்தில் சைவம் - சங்க இலக்கியங்களில் சைவம் - காப்பியங்களில் சைவம்.
- கூறு 2 : சைவ சித்தாந்தக் கருத்துக்கள் - பன்னிரு திருமுறையில் சைவ சித்தாந்தக் கருத்துக்கள்.
- கூறு 3 : மெய்கண்ட சாத்திரங்கள் - சந்தானாசாரியர் - பதினான்கு சாத்திரங்கள் அறிமுகம் - உண்மை விளக்கம்.
- கூறு 4 : திருவருட்பயன் - பதிமுதுநிலை - உயிரவைநிலை - இருள்மல நிலை.
- கூறு 5 : சிவஞானபோதம் - 12 நூற்பாக்கள் மட்டும் (உதாரணச் செய்யுட்கள், ஏது, அதிகரணம் நீங்கலாக)

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விருப்பப்பாடம்
4. தமிழும் கிறித்தவமும்

கூறு 1 : விவிலியம்

- 1) திருப்பாடல்கள் (1-15 பாடல்கள்)
- 2) நீதிமொழிகள் (1-15 பாடல்கள்)
- 3) எஸ்தர் யோனா (பழைய ஏற்பாடு)
- 4) லூக்காஸ் பிமோன் (புதிய ஏற்பாடு)
- 5) புதிய ஏற்பாட்டு உவமைகள்

கூறு 2 : கிறித்தவத் தொண்டர்களின் பணி

- 1) மேல்நாட்டார் - தத்துவப் போதகர், வீரமாமுனிவர், சீகன் பால்கு ஐயர், கால்டுவெல், போப் ஐயர் (வீரமாமுனிவர் மட்டும் விரிவு)
- 2) தமிழ் நாட்டார் - வேதநாயகம் பிள்ளை, வேதநாயகம் சாஸ்திரியார், எச்.ஏ. கிருஷ்ணப்பிள்ளை, தனிநாயக அடிகள், முனைவர் கு. இன்னாசி.

கூறு 3 : இலக்கணம்

தொன்னூல் விளக்கம் - நுண் மதிப்பீடு - ச.வே. சுப்பிரமணியம்.

கூறு 4 : கிறித்தவர்களின் வருகையால் வளர்ந்த கலைகள்

- 1) தமிழகத்தில் அச்சுக்கலை, 2) மொழிபெயர்ப்புக் கலை, 3) உரைநடை வளர்ச்சி

கூறு 5 : காப்பியம் - திருத்தொண்டர் காப்பியம் - டாக்டர் கு. இன்னாசி
சிறுநிலக்கியம் - தாமஸ்மலைக் குறவஞ்சி - பொன்னு ஆ. சத்திய சாட்சி
புதினம் - யாத்திரை - மாற்கு
கட்டுரைகள் - 1) ரூத்து, 2) தற்காலத்தில் விஞ்ஞானம் பரிசுத்த வேதாகமம்

பாட நூல்கள் :

- 1) திருவிவிலியம் (பொது மொழி பெயர்ப்பு)
- 2) ச.வே. சுப்பிரமணியம், தொன்னூல் விளக்கம் - நுண் மதிப்பீடு
- 3) வீரமாமுனிவர் - தேம்பாவணி
- 4) கு. இன்னாசி, திருத்தொண்டர் காப்பியம்
- 5) மாற்கு, யாத்திரை

பார்வை நூல்கள் :

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2. மயிலை சீனி. வேங்கடசாமி : கிறித்தவமும் தமிழும், வசந்தா பதிப்பகம், ஜோசப் குடியிருப்பு,

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கிறிஸ்டியன் லிட்டரேச்சர் சொசைட்டி,
போஸ்ட் பாக்ஸ் 501,
பார்க் டவுன்,
சென்னை.
4. வி.மி. ஞானப்பிரகாசம், சே.ச. : விவிலிய விருந்து,
(ப.ஆ) கிறித்தவ ஆய்வு மையம்,
மதுரை காமராசர் பல்கலைக்கழகம்.
5. தயானந்தன் பிரான்சிஸ் : கிறிஸ்துநெறிப்பார்வைகள்,
கிறித்தவ இலக்கியச் சங்கம்.

விருப்பப்பாடம்

5. இசுலாமியத் தமிழிலக்கிய வகைகள்

கூறு 1 : இஸ்லாம் - சில அடிப்படைகள்

இஸ்லாம் என்றால் என்ன? - திருக்குர்ஆனும் ஹமீதும் - இஸ்லாத்தின் தோற்றம் - அனைவருக்கும் அழகிய முன்மாதிரி - முஸ்லீம்களின் கடமைகளும் நம்பிக்கைகளும் - சில அடிப்படை நம்பிக்கைகள் - சூ.பித்துவம் ஓர் அறிமுகம் - சூ.பித்துவத்தின் அடிப்படை அனுபவம் - இரண்டு விதமான நபிமொழிகள் - பாமரர் யார்? - மற்ற மதங்களின் தாக்கம் - யாரெல்லாம் சூ.பி ஆகலாம்? - பொய்யான குற்றச்சாட்டு - சூ.பித்துவத்தின் தாக்கம் - ஞானாசிரியர்.

கூறு 2 : கவிதைகள்

இறையருள்மாலை (கா. அப்துல் காதர்) - இறைதுதி (எம்.ஏ. நு.மான்) - நபிகள் நாயக மான்மிய மஞ்சரி (சதாவதானி செய்குதம்பிப் பாவலர் - முதல் 6 பாடம்) - தீன்குறள் பேரின்பம் (இ. பதுருத்தீன்) - எழுவகை அழகு (எம்.சி.எம். சுனபா) - கல்வெட்டு (அப்துல் ரகுமான்) - காவிய நாயகர் (மு. மேத்தா) - சுவர்க்கமும் நரகமும் (எம்.ஏ. நு.மான்) - விசாப் பறவைகள் (தஞ்சை நபிநேசன்) - தண்ணீர் (க.து.மு. இ.பால்).

கூறு 3 : சிறுகதை

அடையாளங்கள் (தோப்பில் முகம்மது மீரான்) - அசன் கண்ணப்பர் (மீரான் மைதீன்) - கிளை நதிகள் (களந்தை பீர் முகம்மது) - ஒரு பவுன் மஹர் (டி.கே.எம். காதர்) - சாஹர் (ஹ.மு. நத்தர்ஷா) - ஹாத்திம் தாஃ (நாகூர் ரூமி) - அன்பின் நிழல் (பர்வீன் பானு) - எட்டெழுத்து (முஸ்தபாலன்) - ஹஜ் பயணம் (எஸ். அர்ஷியா) - மண் குதிர் (தாழை மதியவன்) - பூவன்பழம் (வைக்கம் முகம்மது பஷீர் - தமிழில் குளச்சல் மு. யூசர்).

கூறு 4 : கட்டுரைகள்

வாழ்வின் குறிக்கோள் வணக்கமேயாகும் (கா. அப்துல் கபூர்) - இணையிலா வெற்றி வீரர் (எஸ்.ஏ. சையது அப்துல்லா) - இன்றைய தினத்தில் வாழ் (அப்துல் ஹஹீம்) - அரபுத்தமிழ் (மணவை முஸ்தபா) - அகிலத்தின் அறிவு மையம் (கம்பம் எஸ். முகம்மதலி) - எல்லாரும் பேணும் நல்லிணக்கம் (எம்பில் தஜம்முல் முஹம்மது) - புகழ்மாலை (ஜே.எம். சாலி) - தத்துவமேதை (ஜலாலுத்தீன்) - ஆன்மாவின் பாடல் (அப்துல் ரகுமான்) - பாண்டியன் தலைநகர் (எம்.கே.ஈ. மவ்லானா).

கூறு 5 : புதினம்

தாயுமானவர் (நாகூர் ரூமி)

இரண்டாம் ஆண்டு
மூன்றாம்பருவம்

தாள் IX
சிற்றிலக்கியம்

| | | | | | |
|------|---|---|---------------|---|--|
| கூறு | 1 | : | கலம்பகம் | — | திருவரங்கக்கலம்பகம் (1-30 பாடல்கள்) |
| கூறு | 2 | : | பிள்ளைத்தமிழ் | — | முத்துக்குமாரசுவாமி பிள்ளைத்தமிழ் (முதல் 5 பருவங்கள்) சாரதா பதிப்பகம், இராயப்பேட்டை, சென்னை-14, 2008. |
| கூறு | 3 | : | பரணி | — | கலிங்கத்துப்பரணி(கடைதிறப்பு. களம் பாடியது) |
| கூறு | 4 | : | உலா | — | திருவெங்கையுலா (முழுவதும்) |
| கூறு | 5 | : | கோவை | — | தஞ்சைவாணன் கோவை (1-50 பாடல்கள்) |

பாட நூல்கள் :

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சென்னை-14, 2008.
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ஆ. சிவலிங்கனார் உரை,
மயிலம் பொம்மபுர ஆதீன வெளியீடு,
மயிலம்.
5. பொய்யாமொழிப் புலவர் : தஞ்சைவாணன்கோவை
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பார்வை நூல்கள் :

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முதற்பதிப்பு, 2002.
2. ந.வீ. செயராமன் : சிற்றிலக்கியச் செல்வம்,
மணிவாசகர் பதிப்பகம், சென்னை,
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1985.
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1958.

தாள் X

ஆராய்ச்சி நெறிமுறைகள்

- கூறு 1 : **ஆராய்ச்சி** : நெறிமுறைகள் விளக்கம் - ஆராய்ச்சிப் பொருள் - ஆய்வாளர்க்குரிய தகுதிகள் - ஆராய்ச்சி வகைகள் - அணுகுமுறைகள் - கருதுகோள் - ஆய்வுச் சிக்கல்கள்.
- கூறு 2 : **ஆய்வின் அடிப்படை நெறிமுறைகள்** : ஆய்வுப் பொருளைத் தெளிவாகச் சுட்டல் - ஆய்வுப் பொருள் பற்றி இதுவரை செய்யப்பட்ட ஆய்வுகள் - ஆராயப்பட வேண்டியன - ஆராயப்பட வேண்டுவனவற்றுள் இப்போது எடுத்துக்கொள்ளப்பட வேண்டியன.
- கூறு 3 : ஆய்வுலக அடிப்படைக் கோட்பாடுகள் : செய்திகள்(Facts) - கருத்துகள் - விதி (Law) - கொள்கை (Theory) - வகைப்பாடு (Classification) - கோட்பாடுகள் - அறிவியல் ஆய்வும் - கலையியல் ஆய்வும்.
- கூறு 4 : **ஆய்வேட்டின் அமைப்பும் வரைவு முறையும்** : ஆய்வேட்டின் அமைப்பு - தகவல் திரட்டல் - திட்டமிடுதல் - ஆய்வு மொழிநடை - முதல் படி (First Draft) - திருத்தப்படி (Revised Draft) - அடிக்குறிப்பு (Footnote) - துணைநூற்பட்டியல் (Bibliography) - குறுக்க விளக்கம் - முன்னுரை - முடிவுரை - பரிந்துரை - படங்கள் - அட்டவணைகள் - பொருட்குறிப்பு அகராதி.
- கூறு 5 : தமிழாய்வுப் பரப்பு - இலக்கிய ஆய்வு - ஒப்பிலக்கிய ஆய்வு - இலக்கிய வரலாற்று ஆய்வு - இலக்கண ஆய்வுமொழி வரலாற்று ஆய்வு - அகராதி ஆய்வு - தமிழியலும் மொழியியலும் - தமிழியலும் பண்பாட்டியலும் - தமிழியலும் நுண்கலைகளும் - தமிழியலும் உளவியலும் - தமிழியலும் தொல்பொருள் அகராதி.

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தஞ்சாவூர் - 4,
2004.

தாள் XI
தொல்காப்பியம் - பொருளதிகாரம் I

| | | | |
|------|---|---|----------------|
| கூறு | 1 | : | அகத்திணையியல் |
| கூறு | 2 | : | புறத்திணையியல் |
| கூறு | 3 | : | களவியல் |
| கூறு | 4 | : | கற்பியல் |
| கூறு | 5 | : | பொருளியல் |

பார்வை நூல்கள் :

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தாள் XII உரையியல்

கூறு 1 : உரை பொதுவிளக்கம்

அ) உரை வரையறை, விளக்கம், உரை வகைகள் : இலக்கண இலக்கிய உரைகள், அதன் உள்வகைகள், எழுத்துரை-வாய்மொழி உரை, பொழிப்புரை-பதவுரை, குறிப்புரை-விருத்தியுரை, செய்யுள் உரை-உரையுரை, மூலநூலாசிரியர் உரை-வேறு ஆசிரியர் உரை, உடன்பாட்டுரை-மறுப்புரை, உரைக்கூறுகள் : கருத்துரை, மூலப்பாடம், அருஞ்சொற்பொருள், எடுத்துக்காட்டு, பாடபேதம், விளக்கம், ஒப்பிட்டு விளக்குதல், உரை-உரைநடை வேறுபாடு, உரைக்கூறு அடிப்படையில் வகைமை : அருஞ்சொற்பொருள் உரை, விருத்தியுரை, பொழிப்புரை, மறுப்புரை, நய உரை.

ஆ) உரை வரலாறு : உரை இல்லாக்காலம், உரையின் தேவை, பயன், வாய்மொழி உரை, உரைக்கூறுகள் தோற்றம், உரைக்கு உரை, உரை அமைப்பு, உரையாசிரியர் : தகுதி, பண்பு, திறனாய்வாளர் ஆதல், உரை திறனாய்வாதல், உரை குறித்த நம்பிக்கைகள், உரை எழுதாமை, உரையாசிரியர் பரம்பரை, உரைப் பள்ளிகள்.

கூறு 2 : இலக்கண உரைகள்

அ) வகைமை அடிப்படையில் உரையாசிரியர் : எழுத்திலக்கண, சொல்லிலக்கண, பொருளிலக்கண, யாப்பிலக்கண, அணியிலக்கண உரைகள்.

ஆ) நூல் அடிப்படையில் உரை : தொல்காப்பியம், நன்னூல் முதலாக, இலக்கண உரையின் கூறுகள், உரை வடிவங்கள், இலக்கண உரைகளுக்கு இடையே உள்ள பொதுத்தன்மைகள், இலக்கண உரை வரலாறு.

கூறு 3 : இலக்கிய உரைகள்

அ) வகைமை அடிப்படையில் உரைகள் : சங்க இலக்கிய, அற இலக்கிய, காப்பிய, புராண, பக்தி, சிற்றிலக்கிய உரைகள், சைவ, வைணவ, பௌத்த, சமண இலக்கிய உரைகள், நூல் அடிப்படை வகை : புறநானூறு, சிலப்பதிகாரம், திருக்குறள் முதலான உரைகள்.

ஆ) உள்ளடக்க அடிப்படையில் வகைமை : சமய உரை, தத்துவ உரை, கிறித்துவ உரை, சமண உரை, சைவ உரை, வைணவ உரை.

கூறு 4 : உரை ஆய்வுகள்

அ) உரை வளம், உரைக் கொத்து, தொகுப்புரைகள், உரைக் களஞ்சியம் முதலான பெயர்களில் வந்துள்ளவை குறித்த மதிப்பீடுகள், உரையின் வரலாற்றுப் பின்னணி.

ஆ) உரை ஆய்வு வரலாறு : இலக்கண, இலக்கியம் முதலான வகைமை நோக்கில் ஆய்வு வரலாறு, ஒரு உரையாசிரியரின் பல உரைகள் பற்றிய ஆய்வு வரலாறு, ஒரு நூலுக்கு எழுதப்பட்ட உரைகளின் ஆய்வு வரலாறு, உரைமொழி, உரை அமைப்பு பற்றிய ஆய்வுகள், உரைகளைப் பற்றிய ஆராய்ந்தவர்கள், உரை ஆராய்ச்சியின் வகைமைகள், உரையின் மொழி குறித்த ஆய்வுகள், மொழிக்கலப்பு, மணிப்பிரவாளம் முதலான மரபு உரை ஆய்வுகள், நூலமைப்பு பற்றிய உரைக் கருத்துகளை ஆராய்தல், நூலின் சமூக, அரசியல் பின்புலத்தின் அடிப்படைகளை உரைகள் வெளிக்கொண்டு வருதல், மீட்டுவாக்கமும் மூலமும் உரையும்.

கூறு 5 : உரை ஆளுமைகள் - தனித்தன்மைகள்

அ) இலக்கண உரையாசிரியர்கள் : இளம்பூரணர், பேராசிரியர், நச்சினார்க்கினியர், சேனாவரையர், கல்லாடனார், மயிலைநாதர், சிவஞான முனிவர், ஆறுமுக நாவலர், கு. சுந்தரமூர்த்தி, ஆ. சிவலிங்கனார், ஆ. புவராகம்பிள்ளை, தேவநேயப் பாவாணர், பாலசுந்தரம், புலியூர்க்கேசிகன், ஓளவை சு. துரைசாமிப்பிள்ளை, மு.வ. புலியூர்க்கேசிகன்.

ஆ) இலக்கிய உரையாசிரியர்கள் : நச்சினார்க்கினியர், அடியார்க்கு நல்லார், பரிமேலழகர், மணக்குடவர், காளிங்கர், சி.கே. சுப்பிரமணியம், உ.வே. சாமிநாதையர், பெருமழைப் புலவர் சோமசுந்தரனார், ஓளவை சு. துரைசாமிப் பிள்ளை, மு.வ. புலியூர்க்கேசிகன்.

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53, புதுத்தெரு, சிதம்பரம் - 608 001,
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2-ஆவது மெயின்ரோடு, சிபிடி வளாகம்,
தரமணி, சென்னை - 600 113,
2003.
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மெய்யப்பன் பதிப்பகம்,
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2006.

விருப்பப்பாடம் - III

1. தமிழ் இலக்கண வரலாறு

- கூறு 1 : இலக்கண வரலாறு - முந்து நூல் - அகத்தியம் - தொல்காப்பியம்.
- கூறு 2 : பிற்கால எழுத்து, சொல்லிலக்கண வளர்ச்சி - நன்னூல் - நேமிநாதம் - வீரசோழியம் - இலக்கண விளக்கம் - தொன்னூல் விளக்கம் - முத்துவீரியம் - சுவாமிநாதம்.
- கூறு 3 : பிற்காலப் பொருள் - யாப்பு - அணியிலக்கண வளர்ச்சி
இறையனார் அகப்பொருள் - நம்பியகப்பொருள் - மாறன் அகப்பொருள் - புறப்பொருள் வெண்பாமாலை, வீரசோழியம் இலக்கண விளக்கம் - தொன்னூல் விளக்கம் - முத்துவீரியம் - சுவாமிநாதம் - யாப்பருங்கலம், யாப்பருங்கலக் காரிகை, தண்டியலங்காரம், மாறனலங்காரம்.
- கூறு 4 : பாட்டியல் நூல்களின் வளர்ச்சி
- கூறு 5 : நிகண்டுகள், அகராதிகள்

பாட நூல்கள் :

1. புலவர் இரா. இளங்குமரன் : இலக்கண வரலாறு, மணிவாசகர் பதிப்பகம், சென்னை - 600 001.
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விருப்பப்பாடம் 2. தொல்லியல்

கூறு 1 : தொல்லியல் அறிமுகம்

தொல்லியலின் பொருள், வரைவிலக்கணம் மற்றும் அதன் முக்கியத்துவம் - வரலாற்றுக்குச் சான்றாகத் தொல்லியல் - தொல்லியல் வகைகள் - தொல்லியலின் செயல் நோக்கம் - தொல்லியலுக்கும் பிற இயலுக்கும் இடையேயான தொடர்பு - தொல்லியலாரின் பணிகள் - சுற்றாய்வு - அரும்பொருட்களைப் பாதுகாத்தல்.

கூறு 2 : அகழாய்வியல்

அகழாய்வும் அதன் வகைகளும் - காலவரையறை செய்தல் - தமிழ் நாட்டின் அகழாய்விடங்கள் - காவிரிப்பூம்பட்டினத்தில் அகழாய்வுகள் - உறையூரின் அகழ்வாராய்ச்சி -கேரளத்தில் அகழ்வாய்வுகள் - புருஸ்புட் தொண்டு.

கூறு 3 : வரலாற்றுக்கு முற்பட்ட காலம்

மண்ணியல் காலமும் பெரும்பணிப்பட்டு காலமும் - கற்காலம் - உலோக காலம் - இந்திய மட்கலப் பண்பாடு - இந்திய தொல்லியல்துறை.

கூறு 4 : கல்வெட்டியல்

கல்வெட்டியலின் பொருளும் முக்கியத்துவமும் - கல்வெட்டுகளின் வகைகள் - தொல்லெழுத்தியல் - தமிழ் எழுத்து (அ) தமிழ் பிராமி எழுத்து - வட்டெழுத்து - கிரந்த எழுத்து - கல்வெட்டுகளின் கால நிர்ணயம் - பாண்டியரின் உக்கிரன் கோட்டை - பாண்டிய நாட்டிலுள்ள சில வீரக்கற்கள்

கூறு 5 : நாணயவியல்

மௌரியர் கால நாணயங்கள் - குஷாணர் கால நாணயங்கள் - சாளுக்கியர் நாணயங்கள் - பாண்டியர் கால நாணயங்கள் - சேரர் நாணயங்கள் - பல்லவர் நாணயங்கள் - சோழர்கால நாணயங்கள் - விஜயநகர அரசர் கால நாணயங்கள் - இந்தியாவில் அயல்நாட்டு நாணயங்கள் - தமிழ் நாட்டியல் அயலக நாணயங்கள்.

பாட நூல்கள் :

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பார்வை நூல்கள் :

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1205/1, கருப்பூர் சாலை,
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மதுரை,
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விருப்பப்பாடம்
3. நாட்டார் வழக்காற்றியல்

- கூறு 1 : நாட்டார் வழக்காற்றியல், கருத்தாக்கங்கள்
- கூறு 2 : நாட்டார் வழக்காற்றியல் - கோட்பாடுகள்
- கூறு 3 : நாட்டார் வழக்காற்றியலும் பிற புலங்களும், வாய்மொழி வழக்காறுகள்
- கூறு 4 : நாட்டார் நிகழ் கலைகள்
- கூறு 5 : நாட்டார் வாழ்வும் புழங்குபொருள் பண்பாடும், சமயத்தின் தோற்றம்

பாடநூல் :

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தூய சவேரியர் தன்னாட்சிக் கல்லூரி,
பாளையங்கோட்டை,
முதற்பதிப்பு, 1997.

விருப்பப்பாடம்

4. ஒப்பீட்டு நேக்கில் உலகச் செம்மொழிகள்

- கூறு 1 : உலகச் செம்மொழிகள் வரலாறு
(கிரேக்கம், இலத்தீன், தமிழ், ஈப்ரு, அரேபியம், சீனம், சமஸ்கிருதம்)
- கூறு 2 : உலகச் செம்மொழிகளின் இலக்கியங்கள்
(கிரேக்கம், இலத்தீன், தமிழ், ஈப்ரு, அரேபியம், சீனம், சமஸ்கிருதம்)
- கூறு 3 : உலகச் செம்மொழிகளில் தொகையாக்கங்கள்
(கிரேக்கம், இலத்தீன், தமிழ், ஈப்ரு, அரேபியம், சீனம், சமஸ்கிருதம்)
- கூறு 4 : உலகச் செம்மொழி இலக்கிய பாடுபொருள்கள் - கிரேக்கம், இலத்தீன்
(கையறுநிலை, காதல், வீரம், இசைப்பாடல்), தமிழ் (அகம், புறம், அறநெறிகள், தத்துவம்), ஈப்ரு (வேதாகம நெறிகள்), அரேபியம் (வாய்மொழிக்கதை மரபுக்ள) - சீனம் (அரசியல், தத்துவம்) - சமஸ்கிருதம் (இயற்கை, வழிபாடு, பக்தி, நீதி)
- கூறு 5 : ஒப்பீட்டு நோக்கில் உலகச் செம்மொழிகள் - பொதுத்தன்மைகள்
(1) வாய்மொழி மரபு, பாணர் மரபு, வீரயுகப் பண்புகள், கையறுநிலை
(கிரேக்கம் - தமிழ் - இலத்தீன் ஒப்பீடு)
(2) தொல்காப்பியப் பொருளதிகாரமும் அரிஸ்டாடிலின் கவிதையிலும் (தமிழ் - கிரேக்கம் ஒப்பீடு)
(3) கதை மரபுகள் - இதிகாசம், காப்பியம் (ஹோமரின் இலியட், ஒடிசி, வர்ஜிலின் காப்பியம்), சிலப்பதிகாரம், மணிமேகலை (தமிழ், சமஸ்கிருதம், கிரேக்கம்)
(4) சீனக் கன்பியூசிய அறநெறிகளும் திருவள்ளுவரது அறநெறிகளும்

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பார்வை நூல்கள் :

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விருப்பப்பாடம்
5. இந்திய தத்துவங்கள்

- கூறு 1 : இந்தியத் தத்துவம், உலகாயதம், ஆசீவகம்
- கூறு 2 : சமணம், சிலம்பில் சமணம், பௌத்தம், யோகம், நியாயம்
- கூறு 3 : வைசேடிகம், பூர்வ மீமாம்சம், சத்த பிரமவாதம், வேதாந்தம், பரிணாமவாதம்
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பாடநூல் :

1. டாக்டர் சோ.ந. கந்தசாமி : இந்தியத் தத்துவக் களஞ்சியம் (தொகுதி, 1-3),
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53, புதுத்தெரு, சிதம்பரம் - 608 001,
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**இரண்டாம் ஆண்டு
நான்காம்பருவம்**

**தாள் XIII
சங்க இலக்கியம்**

| | | | |
|--------|---|-----------------------------------|---|
| கூறு 1 | : | குறுந்தொகை நற்றிணை அகநானூறு | - 10 பாடல்கள் (221 – 230 பாடல்கள்) - 10 பாடல்கள் (31 – 40 பாடல்கள்) - 5 பாடல்கள் (241 – 245 பாடல்கள்) |
| கூறு 2 | : | புறநானூறு பதிற்றுப்பத்து | - 15 பாடல்கள் (201 – 210 பாடல்கள்) - 10 பாடல்கள் (ஆறாம் பத்து) |
| கூறு 3 | : | திருமுருகாற்றுப்படை (முழுவதும்) | |
| கூறு 4 | : | கலித்தொகை | - 20 பாடல்கள் (குறிஞ்சிக்கலி – 10 பாடல்கள், மருதக்கலி – 10 பாடல்கள்) |
| கூறு 5 | : | பரிபாடல் | - 3 பாடல்கள் (செவ்வேள் - 8ஆவது பாடல், வையை - 10 ஆவது பாடல், திருமால் - 15 ஆவது பாடல்) |

பார்வை நூல்கள் :

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தாள் XIV அகராதியியல்

கூறு 1 : **அகராதியியல், அகராதிக்கலை**

அ) அகராதியியல் - சொல், விளக்கம், வரலாறு, இலக்கணமும் அகராதியிலும், அகராதியிலும் மொழியியலும், தமிழ் அகராதி வரலாறு, தொல்காப்பியர் காலம், நிகண்டுக்காலம் - நிகண்டுகளின் தோற்றம், பொது அமைப்பு, வளர்ச்சி நிலை, பிற்கால நிகண்டுகள்.

ஆ) ஐரோப்பியர் அகராதிகள் - நிகண்டுவழிப்பட்ட தமிழ் மரபு அகராதிகள் (ஒரு மொழி அகராதிகள்) இவற்றின் அமைப்பு வேறுபாடு, தற்கால அகராதி முயற்சிகள்.

கூறு 2 : **அகராதி வகைகள்**

அ) கலைக்களஞ்சியம் - வரையறை, தோற்றம், வளர்ச்சி வகை, வாழ்வியல் களஞ்சியம், அறிவியல் களஞ்சியம், சிறப்புக் கலைக் களஞ்சியங்கள், அறிவியல் களஞ்சியம், சிறப்புக் கலைக்களஞ்சியங்கள், ஆய்வடங்கல் வகைகள்.

ஆ) பொது அகராதிகள் - சிறப்பு அகராதிகள், மொழி அகராதிகள், ஒருமொழி, இருமொழி, பன்மொழி அகராதிகள், காலநிரல் அகராதிகள், குறிப்பிட்ட காலநிலை அகராதிகள், வரலாற்று அகராதிகள், தகுமொழிவிளக்க அகராதி, சொல்லடைவு, சொற்றொகுதி, ஆய்வடங்கள், பயிற்றகராதி, கற்போர் அகராதி, வட்டார வழக்கு அகராதி, கலைச்சொல்லகராதி, தொழிற்கலைச்சொல் அகராதி, கணினி வழியிலான அகராதிகள்.

கூறு 3 : **சொற்பொருண்மையியலும் கொள்கைகளும்**

அ) சொல் - உலகப்பொருள் தொடர்பு : குறியியல் கொள்கை - பொருள் முக்கோணக் கொள்கை, அமைப்புமொழிக் கொள்கை, மாற்றிலக்கணக் கொள்கை, பயன்வழியியல் கொள்கை, சொற்பொருட் கூறுகள், கருத்துப்பொருள், குறிப்புப்பொருள், ஒப்புருச்சொல், ஒருபொருட் பலசொல், எதிர்ச்சொல், மீச்சொல், உட்பொருட்சொல், பொருட்பன்மை அல்லது பல் பொருண்மை - தற்காலிகப் பொருள் அணிநயப் பொருள், நேர்ப்பொருள், சூழற்பொருள், சிறப்புப் பொருள், அடிப்படைப் பொருள், தலைமைப் பொருள், மாற்றுப்பொருள், தழுவபொருள் பிற பொருள்கள்.

ஆ) புறப்பொருள் கொள்கை, எண்ணக் கொள்கை, தொடர்புக் கொள்கை, தூண்டல் கொள்கை, விளைவுக் கொள்கை, பயன்பாட்டுக் கொள்கை, பேச்சுச் செயல் கொள்கை, பயன் நிருபணக் கொள்கை, உண்மை நிபந்தனைக் கொள்கை, சூழ்நிலைக் கொள்கை, மொழிக் கூறுத் தொடர்புக் கொள்கை.

கூறு 4 : **அகராதி உருவாக்கம்**

அ) அகராதி உருவாக்கப் படிநிலைகள் - திட்டமிடல், தரவுமூலங்கள், சொல் தெரிவு, முற்றுச் சொற்பிரிப்பு, பகுதிச் சொற்பிரிப்பு.

ஆ) பதிவுத் தெரிவு - பழஞ்சொல், புதுச்சொல், வழக்கொழிச்சொல், கலைச்சொல், கூட்டுச்சொல், மரபுத்தொடர்.

கூறு 5 : அகராதிப் பதிவுக் கூறுகள், ஆய்வுகள்

அ) அகராதிப் பதிவுக் கூறுகள் - தலைச்சொல் பகுதி, பொருட்பகுதி, அடிப்படை வடிவம், எழுத்துப் பெயர்ப்பு, ஒலிப்புநெறி, இலக்கணக்குறிப்பு, சொல்மூலம், சொற்பிறப்பு, சொற்பொருள், பொருள்தரு முறைகள், குறுக்கு நோக்கீடு, மேற்கோள் விளக்கக் குறிப்புகள், குறிப்பான்கள்.

ஆ) அகராதிகள் மதிப்பீடு, தமிழில் உருவாகியுள்ள அகராதிகளை மதிப்பிடுதல், கிரியாவின் தற்காலத் தமிழ் அகராதி, தமிழ் லெக்சிகன் முதலான அகராதிகளை ஒப்பிட்டு அறிதல், அகராதியியல் நிறுவனங்கள், வல்லுநர்களின் திறன்களை பங்களிப்புகளைத் தொகுத்து மதிப்பிடுதல், அகராதியியல் ஆய்வுகளைத் தொகுத்து அறிதல்.

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தாள் XV
தொல்காப்பியம் - பொருளதிகாரம் II

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|--------|---|------------------|-----------------------------|
| கூறு 1 | : | மெய்ப்பாட்டியல் | |
| கூறு 2 | : | உவமயியல் | |
| கூறு 3 | : | மரபியல் | |
| கூறு 4 | : | செய்யுளியல் - I | குத்திரம் 1 முதல் 118 வரை |
| கூறு 5 | : | செய்யுளியல் - II | குத்திரம் 119 முதல் 235 வரை |

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தாள் XVI

பதிப்பியல்

கூறு 1 : தமிழ்மொழி எழுத்தியல் வரலாறு

தமிழ் வரிவடிவம் : வடமொழி – தென்பிராமி உறவு, இந்திய, தென்னிந்திய வரிவடிவ மரபு, ஓவியங்களும் எழுத்தும், வட்டெழுத்து, கோல் எழுத்து, தமிழ் எழுத்து, கிரந்த எழுத்து, எழுத்துச் சீர்திருத்தம், எழுத்தாணி, வண்ணம், உளி முதலான கருவிகளின் காரணம்.

அரசியல், சமயத் தாக்கமும் மொழியின் தகுதிப்பாடும், அரசியல் நிர்வாக மொழிகள், தமிழ் வேந்தர்களின் ஆட்சிப் பகுதிகள், ஆட்சிக் காலங்கள் என்ற வேறுபாடுகளால் தோன்றும் தமிழ் எழுத்து வேறுபாடு, ஆவணங்களின் யாப்பு, உரைநடை, பேச்சு மொழி என்ற வேறுபாடு, ஐரோப்பியர் வருகை, எழுத்துச் சீர்திருத்தம், அச்சப் பொறிக்கு ஏற்பக் காலந்தோறும் எழுத்துரு மாற்றம், கணினியின் காரணமாக எழுத்துரு மாறுதல்கள், சராசரி மக்கள் கல்வி பெறுதல், தமிழ் உரைநடையாக மாறுதல்.

புதிப்பும் உண்மைத் தேடலும் : பதிப்பு அறநெறிகள், பதிப்பு முயற்சிக்கான திட்டம், உழைப்பு, களப்பணி.

கூறு 2 : சுவடிப் பதிப்பு

கிடைக்கும் தமிழ் மொழிச் சுவடியின் இட, கால எல்லைப் பரப்பு : சுவடி அட்டவணைகள், சுவடிச் சேகரிப்பு மையங்கள், சுவடிப் பாதுகாப்பு, அச்சிடல், நகல் எடுத்தல் தொழில் நுட்பங்கள், சுவடிகளின் உள்ளடக்க வகைமைப் பரப்பு : இலக்கியம், இலக்கணம், மருத்துவம், கணிதம், ஜோதிடம், நிர்வாகக் கணக்குகள், நாட்குறிப்பு, கடிதம், அரசு ஆவணங்கள், கோயில் ஆவணங்கள், மக்கள் சொத்து ஆவணங்கள், பதிப்பிக்கப்படாத சுவடிகள், பதிப்பிக்கப்பட்ட சுவடிகள், சுவடிப் பதிப்பின் எதிர்காலத் திட்டங்கள், சுவடிப் பதிப்பில் மொழி அடிப்படையிலான சிக்கல்கள் : மீட்டுருவாக்க வேண்டிய தேவை, சுவடியில் பதிவாகியுள்ள எழுத்து வடிவ வரலாறு, தமிழ், சமஸ்கிருதம், தெலுங்கு, மராட்டியம் சுவடிகளின் இருப்பு, மீள் பதிப்புகள், உரை எழுதுதல் - பதிப்பித்தல் உறவு.

சுவடிப் பதிப்பு ஆளுமைகள் : ஆறுமுக நாவலர், சி.வை.தா., வ.உ.சி., திரு.வி.க., உ.வே.சா., வையாபுரிப்பிள்ளை, தாண்டவராய முதலியார், மழவை மகாலிங்க ஐயர், தி.வே. கோபாலையர், கணேசையர்.

கூறு 3 : தொல்லியல் திரிபு

கல்வெட்டு, செப்பேடு, பாணை ஓடு, நாணயம், நடுகல் முதலானவற்றில் உள்ள தமிழ் எழுத்துப் பதிவுகள், தமிழ்த் தொல்லியல் ஆவணங்கள், பதிப்பிக்கப்படாத எழுத்துப் பெயர்ப்பில் உள்ள கல்வெட்டுகள், தொல்லியல் பதிவுகளின் உள்ளடக்கம், மொழி வகைமைகள் : செய்யுள், உரைநடை, பேச்சு மொழி வடிவத் தாக்கம், மொழிக்கலப்புக்கள், தமிழரசர்களின் பிறமொழித் தொல்லியல் பதிவுகள், தொல்லியல் துறை, தனி ஆர்வலர், ஆய்வாளர்களின் பதிப்பு முயற்சிகள்.

கல்வெட்டுப் பதிப்பு ஆளுமைகள் : மு. ராகவையங்கார், சோம சுந்தர தேசிகர், தி.வை. சதாசிவப் பண்டாரத்தார், வை. சுந்தரேச வாண்டையார், தி.நா. சுப்பிரமணியன், ஐ. மகாதேவன், மயிலை சீனி. வேங்கடசாமி.

கூறு 4 : கணினிப் பதிப்பு

கணினியில் தமிழ் எழுத்துரு வரலாறு, பல்வேறு நிறுவனங்களின் மென்பொருளில் தமிழ் எழுத்துரு, பேக்கேஜ்களில் தமிழ், பதிப்பகம், தனி மனிதர் தமிழ்ப் பதிப்புகளுக்குக் கணினியின் பங்கு, கணினிப் பதிப்புகள், கணினிப் பதிப்புத் திட்டங்கள், பல் ஊடகப் பதிப்புகள், இதழ், நூல், இலக்கியம், அறிவியல், உரை, அறிக்கை, அரசாணை முதலான நவீன உள்ளடக்க மொழிப் பதிவு முறைகள்.

கூறு 5 : காட்சி, ஒலிப் பதிவுகள்

தமிழ் இன, சமூக, பண்பாட்டு, அரசியல் நிகழ்வுகளின் ஒலி, ஒலி-ஒளிப் பதிவுகள், அவற்றில் மொழிப் பதிவுகளின் பங்கு, நாட்டுப்புறவியல், மானிடவியல், சமூகவியல் ஆய்வு மற்றும் ஆவணப்படுத்தும் முயற்சிகளில் ஒலி-ஒளிப் பதிவுகள், அச்சப் படம், மின் ஊடகப் பதிவுப் படங்கள், தமிழியல் குறித்த ஆவணப் படங்கள், குறும்படங்கள், புனைவுப் படங்கள், தமிழ்நாடு இயற்கை, அரசு நிர்வாகம் பற்றிய காட்சிப் பதிவுகள், தமிழரின் வரலாற்று உணர்வும் சம காலப் பதிப்பு முறைகளும், ஒலி, ஒலி-ஒளிப் பதிவு சேமிப்பு நூலகங்கள் முதலானவை.

பாட நூல்கள் :

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பார்வை நூல்கள் :

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அரிய கையெழுத்துச் சுவடித்துறை, தமிழ்ப்பல்கலைக்கழகம்,
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அல்லது

தாள் XVI

ஆய்வேடு (Project)

பக்கவரையறை : 75 - 100

விருப்பப்பாடம் -IV

1. தமிழர் மானிடவியல்

- கூறு 1 : மானிடவியலின் தோற்றம் - விலங்குகளும் மனிதனும் - பண்பாட்டின் தன்மை - வரையறைகள் - வரையறை பற்றிய விவாதங்கள் - பாட்டின் பண்புகள்.
- கூறு 2 : தாய்வழி மரபு - வகைகள் - தமிழகத் தாய்வழிச் சமூகங்கள் - பிற சமூகத்தினர் - ஆதி சமூக அமைப்பு - தமிழ்த் திருமணமுறைகள்.
- கூறு 3 : சாதித் தொன்மங்கள், தோற்றத் தொன்மங்களின் அர்த்தத்தளம், கூற்றுகள் - சாதிகளின் தோற்றத் தொன்மங்கள் - சமூக மாற்றம், சமஸ்கிருதவயமாதலும் சமயமும் - பிற சமூக அமைப்புகள், முரண்பாடுகள் - கோட்பாடுகள் - சடங்குகளின் தன்மைகள் கோட்பாட்டியல் சிந்தனை - தமிழர் சடங்குகளின் பன்முகத் தன்மை
- கூறு 4 : தெய்வ உலகம் - அணுகுமுறை வேறுபாடுகள் - தமிழர் தெய்வ உலகம் - சமூகப் பெயர்வும் குலதெய்வம் வழிபாட்டுக் குழுவின் மாற்றங்கள் - யாத்திரை மானிடவியல் - பீயியல் கருத்தாக்கம் யாத்திரை.
- கூறு 5 : திருவிழா, அமைப்பியத் தளமாற்றங்கள், கைவினைக் கலைஞரும் சமயமும் - புழங்கு பொருள் பண்பாடு - பொருளும் பண்பாடும் - தமிழக கிராமங்கள் - கிழக்கிந்தியக் கம்பெனியாரின் பார்வை - சமகாலத் தமிழ்ச் சமூகம் - கொக்கிக் காலப் பதிவுகள்.

பாட நூல் : தமிழர் மானிடவியல் - பக்தவத்சல பாரதி, அடையாளம், திருச்சி, 2013.

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- கூறு 2 : திருக்குறள் உரைகள் - மொழிபெயர்ப்புகள், பதிப்புகள் - அமைப்புகள், பரிசுகள், ஆளுமைகள் - திறனாய்வுகள் , ஆய்வுகள், நூல்கள் , கட்டுரைகள்
- கூறு 3 : திருக்குறளில் இலக்கண. மொழியியல் பார்வை : எழுத்து, சொல், தொடர், வாக்கியம் - கூற்று : ஒலியன் , உருபன், தொடரன், பொருளன், கருத்தாடல் - புணர்ச்சி இலக்கணம் - உருபொலியன்கள்., திருக்குறள் அகராதிகள் , சொல்லடைவுகள் , பொருளடைவுகள்
- கூறு 4 : யாப்பியல் நோக்கு : எழுத்து, அசை, சீர், தளை, யாப்பு, அடி
- கூறு 5 : அழகியல் - அணியியல் நோக்கு –அணி வகைகள், சொல்லணிகள் - பொருளணிகள் - இசைக்கூறுகள் - ஒலிநயம் - தொடை வகைகள்

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- கூறு 1 : கணினி - பொது அறிமுகம் - கணினி வரலாறு - வன்பொருளும் மென்பொருளும் (Hardware and Software) - கணினியின் அமைப்புச் செயல்பாடு - கணினியின் இன்றைய வளர்ச்சி.
- கூறு 2 : கணினி மொழிகளும் நிரல் உருவாக்கமும் (Computer Languages & Programming), இயந்திர மொழி - சுட்டு மொழி - உயர்நிலை மொழி - மென்பொருள் நிரல் உருவாக்கம் (Software Programme) - செயற்பாட்டு மென்பொருள் (System Software) - பயன்பாட்டு மென்பொருள் (Application Software) - பல்லுடகம் (Multimedia) - இணையம் (Internet) - மின்னஞ்சல் (E-mail) - கணினியின் ஏனைய பயன்பாடுகள்.
- கூறு 3 : கணினி மொழியியல் (Computational Linguistics) இயற்கை மொழிகள் ஆய்வு (Natural Language Processing – NLP) - இயந்திர மொழிபெயர்ப்பு (Machine Translation) - கணினி அகராதியியல் (Computer Lexicography) - தரபு மொழியியல் (Copus Linguistics) - சொல்பிரிப்பான் (Paser)
- கூறு 4 : ஒளி வழி எழுத்துப் படிப்பான் (Optical Character Recognizer) - குரல் அறிவான் (Voice Recognizer) - கணினி நோக்கில் மொழி ஆய்வு – மொழி நோக்கில் கணினி ஆய்வு – செயற்கை அறிவுத் திறன் - கணினி இலக்கிய ஆய்வு
- கூறு 5 : தமிழ்ச் சொல்லாளர் - சொல்லாளரில் இடம் பெறும் மொழிக் கருவிகள் - சொற்பிழை திருத்தி - சந்திப்பிழை திருத்தி - இலக்கணப்பிழை திருத்தி - பல்வேறு அகராதிகள் - சொல்லடைவு - அகரவரிசைப்படுத்தல் - ஏனைய மொழிக்கருவிகள் - பக்க வடிவமைப்பு - இடைவெளி அமைத்தல் - பத்தி வடிவமைப்பு - எழுத்துரு - படம், அட்டவணை இணைத்தல் - கோடு போன்றவை வரைதல் - அடைப்புப் பெட்டி உருவாக்குதல் - அடிக்குறி எண்ணிடல் - பொட்டிடல் - அச்சிடுதல்.

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விருப்பப்பாடம்

4. படைப்பாக்கமும் ஆளுமைத்திறனும்

- கூறு 1 : படைப்பிலக்கிய வீதிகள் - படைப்பாளியை உருவாக்கும் பின்புலங்கள் - படைப்பாளியின் உளவியல் - கோட்பாடுகளும் படைப்பாக்கமும்.
- கூறு 2 : நாடகம் - புதுக்கவிதை - சிறுகதை - நாவல் - ஆய்வுக் கட்டுரை அடிப்படைகளும் விதிகளும்
- கூறு 3 : ஆளுமைப் பண்பு - ஆளமைப் பண்பு பற்றிய கோட்பாடுகள் - வெவ்வேறு பருவங்களில் ஆளுமைப் பண்பின் வளர்ச்சி - ஆளமைப் பண்பை நிர்ணயிக்கும் உடலியல் காரணிகள் - ஆளுமைப் பண்பின் கூறுகள்.
- கூறு 4 : ஆளுமைப் பண்பைப் பாதிக்கும் காரணிகள் - ஆளுமைப் பண்பை மேம்படுத்தும் உளவியல் வழிமுறைகள் - தொடர்பு கொள்ளும் ஆற்றல் - நன்னடத்தை - நீதி நூல்கள் காட்டும் அறவழிகள்.
- கூறு 5 : மகத்தான ஆளுமைகள் - மகாத்மா காந்தி, அம்பேத்கர், பாரதி படைப்பாக்கப் பயிற்சிகள் புதுக்கவிதை - சிறுகதை - ஓரங்க நாடகம் - ஆய்வுக் கட்டுரை படைக்கப் பயிற்றுவித்தல்.

பாட நூல்கள் :

1. படைப்புக்கலை - சுதந்திரமுத்து, பாவைப் பதிப்பகம், சென்னை-14
2. எழுதும் கலை - ஜெயமோகன், தமிழினி, சென்னை-14
3. ஆளுமை மேம்பாடு - எஸ். சுந்தரசீனிவாசன், தாமரை பப்ளிகேஷன்ஸ், சென்னை.

பார்வை நூல்கள் :

1. க. பூரணச்சந்திரன் : கதையியல் அடையாளம், புத்தாந்தம், திருச்சி.
2. தி.சு. நடராசன் : கவிதையெனும் மொழி, நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை.
3. மகரந்தன் : எழுதுவது எப்படி? பழனியப்பா பிரதர்ஸ், சென்னை-14.
4. ஜெயமோகன் : நவீனத் தமிழிலக்கிய அறிமுகம், தமிழினி, சென்னை.
5. டாக்டர் செ. சாரதாம்பாள் : இலக்கியமும் உள்பகுப்பாய்வும், (கொள்கைகளும் பயில்முறைகளும்), ஹரிஹரன் பதிப்பகம், மதுரை, முதற்பதிப்பு, 2004.
6. ஆலன் & பார்பராபீஸ் : அலுவலகத்தில் உடல் மொழி (தமிழில் பி.எஸ்.வி. குமாரசாமி), மஞ்சள் பப்ளிஷிங் ஹவுஸ், போபால், இந்தியா, 2012.
7. வ.ராமசாமி : சுப்பிரமணிய பாரதி, சுதர்சன் பூக்ஸ், நாகர்கோயில்.

8. மைக்கேல் ஹார்ட் : நூறு பேர்,
(மொ.பெ. மணவை முஸ்தபா) மீரா பதிப்பகம், சென்னை-40.
9. எம். கண்ணன் (பதி,) : தலித் இலக்கியம் எனது அனுபவம்,
விடியல் பதிப்பகம், கோயம்புத்தூர், 2004.
10. நா. சந்திரசேகரன் : நானும் என் எழுத்தும்,
ஊலகத் தமிழாராய்ச்சி நிறுவனம்,
சென்னை – 113, பதிப்பு, 2012.
11. தமிழவன் : படைப்பும் படைப்பாளியும்,
காவ்யா, பெங்களூர், 1989.
12. அறவேந்தன் : படைப்பாளுமை,
தாயறம், திருச்சிராப்பள்ளி, 2003.

விருப்பப்பாடம்

5. இந்திய இலக்கியப் பொதுக்கூறுகள்

- கூறு 1 : இந்திய இலக்கியம் - வரையறையும் விளக்கமும் - இந்திய மொழிக் குடும்பங்கள் - தற்கால இந்திய மொழிகள் - இந்தியத் தன்மை, இந்தியப் பொதுக்கூறுகள் - மேனாட்டுத் தாக்கம்.
- கூறு 2 : இந்திய உயர்தனிச் செம்மொழிகளும் செவ்விலக்கியங்களும் - வடமொழிகள் (சமஸ்கிருதம், பிராகிருதம், பாலி) - வேத இலக்கியங்கள் - இதிகாசங்கள் - புராணங்கள் - பிரபந்தங்கள் (சதகம் - தூது ஆகியவை), பகவத் கீதை, கீதகோவிந்தம் போன்ற பக்தி - தத்துவ நூல்கள் - ஞானியர் இயக்கம் : கபீர், நானக், பாலி, பிராகிருத, சமண, பௌத்த இலக்கியங்கள் அறிமுகம்.
- கூறு 3 : இலக்கிய இயக்கங்கள் - 19, 20 ஆம் நூற்றாண்டுகளில் சமுதாயச் சீர்திருத்தம் காந்திய, மார்க்சிய இயக்கங்கள் மொழிச்சார்பு இயக்கங்கள் - விடுதலை இயக்கம் ஆகியவற்றின் தாக்கம் - புனைவியல், எதார்த்தவியல், இருத்தலியம், பின்னை நவீனத்துவம், தலித்தியம், பெண்ணியம் ஆகியவை.
- கூறு 4 : இலக்கிய வகைகள் - வட இந்திய மொழிகளில் கவிதை - புதுக்கவிதை, நாடகம், நாவல், சிறுகதைகளின் (இந்தி, வங்காளி, மராத்தி) வளர்ச்சி இந்த நான்கு வகைகளிலும் தென்னிந்திய மொழிகளில் காட்டும் வளர்ச்சிப் போக்குகள்.
- கூறு 5 : ஞானபீடப் பரிசு பெற்ற எழுத்தாளர்கள் - அசாமி, வங்காளி, ஒரியா, மராத்தி, குஜராத்தி, பஞ்சாபி, இந்தி, தெலுங்கு, கன்னடம், மலையாளம், தமிழ் - இவற்றுள் அவர்களின் பங்களிப்புகள், சிறப்புக் கூறுகள்.

பார்வை நூல்கள் :

1. பா. ஆனந்தகுமார் : இந்திய ஒப்பிலக்கியம் - சூசன்பாசனெட்டை முன்வைத்து, மீனாட்சி புத்தக நிலையம், மதுரை-1, 2003.
2. ச.வே. சுப்பிரமணியம் : திராவிடமொழி இலக்கியங்கள், உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை-113, 2012.
3. கார்த்திகேயன் : தமிழ் - பிராகிருத உறவுகள், அன்னம், நிர்மலா நகர், தஞ்சை-613 007.
4. நவாலியூர் சோ. நடராசன் : வடமொழி இலக்கிய வரலாறு, சங்கீதா பதிப்பகம், சென்னை-14, 1988.
5. க.நா. சுப்பிரமணியம் : சிறந்த பத்து இந்திய நாவல்கள், (தமிழில் தேவகி குருநாதன்) அன்னம், நிர்மலா நகர், தஞ்சை-613 007, பதிப்பு, 1985.
6. அ. பாண்டிரங்கன் : இந்திய இலக்கியம் : பொதுமை வடிவமும் கருவும், புதுவைப் பல்கலைக்கழகம், 1990.

7. அ. பிச்சை : ஒப்பியல் இந்திய இலக்கியம் - ஓர் அறிமுகம், கபிலன் பதிப்பகம், காந்தி கிராமம், திண்டுக்கல், 2003.
8. எஸ். வையாபுரிப்பிள்ளை : தமிழ் இலக்கிய சரிதத்தில் காவிய காலம், அலைகள் வெளியீட்டகம், கோடம்பாக்கம், சென்னை-24, 2010.

THIRUVALLUVAR UNIVERSITY
MASTER OF COMMERCE
UNDER CBCS

(with effect from 2017-2018)

The Course of Study and the Scheme of Examination

| S.NO. | Study Components | | Ins. hrs /week | Cred it | Title of the Paper | Maximum Marks | | |
|--------------|------------------|----------|-------------------|------------|---|---------------|--------------|-------|
| | Course Title | | | | | | | |
| SEMESTER I | | | | | | CIA | Uni. Exam | Total |
| 1 | MAIN | Paper-1 | 6 | 5 | Advanced Financial Management | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | Accounting for Managerial Decisions | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 6 | 4 | Global Marketing | 25 | 75 | 100 |
| 4 | MAIN | Paper-4 | 6 | 4 | Advanced Business Statistics | 25 | 75 | 100 |
| 5 | ELECTIVE | Paper-1 | 6 | 3 | (to choose 1 out of 3) A. Managerial Economics B. Computer Applications in Business C. Insurance and Risk Management | 25 | 75 | 100 |
| | | | 30 | 21 | | 125 | 375 | 500 |
| | | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni. Exam | Total |
| 6 | MAIN | Paper-5 | 6 | 5 | Corporate Laws | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 6 | 5 | Human Resource Management | 25 | 75 | 100 |
| 8 | MAIN | Paper-7 | 5 | 4 | Advanced Accounts | 25 | 75 | 100 |
| 9 | MAIN | Paper-8 | 5 | 4 | Quantitative Techniques for Business Decisions | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 11 | ELECTIVE | Paper-2 | 6 | 3 | (to choose 1 out of 3) A. Retail Management B. E -Commerce C. Bank Management | 25 | 75 | 100 |
| | | | 30 | 23 | | 150 | 450 | 600 |
| | | | | | | | | |
| SEMESTER III | | | | | | CIA | Uni. Exam | Total |
| 12 | MAIN | Paper-9 | 6 | 5 | General Service Tax (GST) | 25 | 75 | 100 |
| 13 | MAIN | Paper-10 | 6 | 5 | Organizational Behavior | 25 | 75 | 100 |
| 14 | MAIN | Paper-11 | 6 | 5 | Advanced Cost Accounting | 25 | 75 | 100 |
| 15 | MAIN | Paper-12 | 6 | 5 | Research Methodology | 25 | 75 | 100 |

| | | | | | | | | |
|--------------------|----------|--|-----------|-----------|--|------------|------------------|--------------|
| 16 | ELECTIVE | Paper-3 | 6 | 3 | (to choose 1 out of 3) A. Financial Service B. Computer and office management C. Services Marketing | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 17 | MAIN | Paper-13 | 6 | 5 | Direct Taxes | 25 | 75 | 100 |
| 18 | MAIN | Paper-14 | 6 | 5 | Investment Management | 25 | 75 | 100 |
| | | Project/Disser- tation * with <i>viva voce</i> (or) | 12 | 10 | | 50 | 150 | 200 |
| 19 | MAIN | Paper-15 | 6 | 5 | Project Development | 25 | 75 | 100 |
| 20 | MAIN | Paper-16 | 6 | 5 | Marketing Research | 25 | 75 | 100 |
| 21 | ELECTIVE | Paper-4 | 6 | 3 | (to choose 1 out of 3) A. Business Environment and Policy B. Introduction to Information Technology C. Sales and Advertising Management | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |

| Subject | Papers | Credit | Total Credits | Marks | Total marks |
|------------------|-----------|----------|---------------|----------|-------------|
| MAIN | 16 | 4-5 | 76 | 100 | 1600 |
| ELECTIVE | 4 | 3 | 12 | 100 | 400 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| Total | 21 | - | 90 | - | 2100 |

* Students have to choose either Project / Dissertation with *viva voce* or Paper-15 and Paper-16 instead of Project / Dissertation.

Project/Dissertation with viva voce:

Maximum Marks 200 Passing Minimum 100 marks

DISSERTATION : 150 Marks

Viva voce : 50 Marks

There will be a Project / Dissertation during the fourth Semester in lieu of theory papers. Teachers may be assigned students based on the total strength of staff and students of the Department. Care should be taken to see that equal no. of students are allotted for work assignment among the teachers concerned.

Duration of the Project / Dissertation - IV Semester - December to April

The general regulations will apply for project / dissertation exam / valuation.

There will not be Practicals for the Computer related papers offered as Electives under various groups in the respective Semesters. These Subjects may be handled by the teachers working in the Commerce Department of the affiliated Colleges.

THIRUVALLUVAR UNIVERSITY
MASTER OF COMMERCE
SYLLABUS
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SEMESTER I
PAPER - 1
ADVANCED FINANCIAL MANAGEMENT

UNIT-I

Financial Management - Functions - Goals of Financial Management - Maximization Vs. optimizations - Risk-return trade off.

UNIT-II

Management of funds - Long term sources - shares and Debentures - Convertible securities and Term Loans - Working Capital financing - Sources and approaches- Bank credit-Basic principles and methods of assessment- Other sources of short term finance- Operating environment of working capital

UNIT-III

Capital structure planning: Concepts of cost of capital - cost of equity, debt, retained earning - Weighted average cost of capital - Capital structure theories - Net income, Net operating income, MM and Traditional Theories - Leverage - Types and significance. Dividend policy and practices - Dividend policies - Factors affecting dividend decision - Dividend theories - Graham, Gordon, Walter and MM Theories.

UNIT-IV

Management of fixed assets - Evaluation of capital investment decision: Payback period - ARR - IRR - NPV - CAPM.

UNIT-V

Working capital management-working capital cycle-forecasting of working capital requirements - Factors influencing working capital-Management of inventory, cash and accounts receivables-payables management-credit and collection policies.

Note: The proportion between Theory and Problems shall be 40:60

Reference Books

1. I M Pandey, Financial Management, Vikas Publishing House Pvt Ltd.
2. John H Hampton, Financial Decision Making, Prentice Hall of India Ltd.
3. Prasanna Chandra, Financial Management, Tata McGraw Hill Publishing Company Limited.
4. M.Y.Khan and P.K.Jain, Financial Management, Tata McGraw Hill Publishing Company Limited.
5. P.V.Ratnam, Financial Management Theory, Problems and Solutions, Kitab Mahal.

PAPER - 2

ACCOUNTING FOR MANAGERIAL DECISIONS

UNIT-I

Accounting for Decision making - Scope and Importance - Decision Accounting vs. Financial Accounting and Cost Accounting.

UNIT-II

Financial and Investment analysis - Analysis and Interpretation - Ratio Analysis- Leverage analysis-Budgeting and budgetary control - Functional Budgets- Master Budget - Flexible budgeting - Zero Base Budgeting-

UNIT-III

Understanding Financial statements-Construction and analysis of profit and loss account and balance sheet-Construction and analysis of Fund flow and cash flow statements.

UNIT-IV

Cost Management- Absorption and Marginal Costing - Cost - volume-profit analysis- Applications and techniques.

UNIT-V

Financial decisions-capital structure-dividend decisions (only simple problems).

Note: 80% of the total marks be allotted for problems and 20% for theory

Prescribed Text Book

Management Accounting and Financial Control - S.N.Maheswari, Sultan Chand & sons, New Delhi

Reference books

1. Management Accounting - Man Mohan and Goyal.
2. Management Accounting - Hingorani and Ramanathan.
3. Management Accounting - Charles Horngren.
4. Management Accounting - J.Batty.

PAPER - 3
GLOBAL MARKETING

UNIT-I

Global Marketing - Scope - Importance - Global vs. National Marketing - Global Marketing Environment - Social - Cultural - Political - Legal and Regulatory Environments.

UNIT-II

International infrastructure for global trade promotion - GATT/ WTO - Export Promotion Councils - Services Institutions - IIFT - NCTI - ECGC - EXIM Bank - Export Promotion Council - Directorate General of Shipping - Global pricing - Objectives and Strategies.

UNIT-III

Global Customers - Segmentation, Targeting and Positioning - Global Product Positioning - Product life Cycle in Global Marketing - Global pricing - Objectives and Strategies.

UNIT-IV

Global Marketing Channels and Physical Distribution - Channel Objectives and Constraints - Channel Strategy - Physical Distribution and Logistics - Global Advertising and Branding - Global Promotion.

UNIT-V

Global Trade Procedure - Export Documentation - Processing of Export Procedure - Payment terms and conditions - Letter of Credit - Pre-shipment and Post Shipment finance - Forfeiting - Buyers Credit - Global Trade Assistance.

Reference books

1. Varshney, R.L. and Bhattacharya B: International Marketing Management, Sultan Chand and Sons, New Delhi.
2. Warnen J.Keegan: Global Marketing Management, Prentice Hall of India, New Delhi.
3. Cherian and Jacob: Export Marketing, Himalaya Publishing House, Mumbai.
4. Duby V.K.: Export Marketing, Common Wealth Publishers, New Delhi

PAPER - 4
ADVANCED BUSINESS STATISTICS

Objective

To apply statistical techniques for interpreting and drawing conclusion for business problems.

UNIT-I

Partial correlation-Partial correlation coefficient-Partial correlation in case of four variables- Multiple correlation-Multiple regression.

UNIT-II

Theory of probability-probability rules-Bayes theorem-Probability distribution- Characteristics and application of Binomial, poisson and normal distribution

UNIT-III

Sampling- sampling methods- sampling error and standard error- relationship between sample size and standard error. Testing hypothesis- testing of means and proportions- large and small samples- Z test and t test.

UNIT-IV

Chi square distribution- Characteristics and application- test of goodness of fit and test of independence- Test of Homogeneity

UNIT-V

F distribution- testing equality of population variances- Analysis of variance-one way and two way classification.

Note: The proportion between theory and problems shall be 20:80

Reference Books

1. S P Gupta, Statistical methods, Sultan chand & Sons, 2000, New Delhi
2. D C Sancheti and V K Kapoor, Business statistics, Sultan Chand and sons, New Delhi
3. J.K.Sharma, Business Statistics-Pearson Education
4. Richard I Levin and David S. Rubit, Statistics for management, 7th Edition,Pearson education, New Delhi, 2002
5. Business statistics and operations research, Dr D Joseph Anbarasu,Lintech press Trichy

ELECTIVE

PAPER - 1

A. MANAGERIAL ECONOMICS

Objectives

Aims to provide a broader understanding of Managerial Economics and its managerial applications.

UNIT-I

Definition and scope of the subject-fundamental concepts and Methods-firm's objectives and the role of managerial economist.

UNIT-II

Demand analysis and Forecasting for consumer goods and capital goods-use of business indicators- type of elasticity.

UNIT-III

Concept and resources allocation- Cost Analysis- Short run and long run Cost functions- production functions- cost price- Output relations.

UNIT-IV

Economics of size and capacity Utilization - Input-Output analysis- Market Structure- Pricing and output general equilibrium.

UNIT-V

Pricing Objectives- pricing methods and approaches-price discrimination, Product line pricing-profit planning and Cost control- Business cycle and Policies.

Reference Books

1. Peterson, managerial economics, 4th edition - Pearson education - New Delhi.
2. Sampat Mokherjee, Business and Managerial Economics, New Central Book Agency, Calcutta.
3. Spencer M.H. Managerial Economics Text, Problems and short cases, Richard D. Irwin INC.
4. Sankaran.S, Managerial Economics Margham Publications, Chennai.
5. Dwivedi D.N , Managerial Economics, Vikas-New Delhi
6. Mankar & Denkar, Business Economics, Himalaya publishing House, Bombay
7. Joel Dean, Managerial Economics, Prentice Hall of India - New Delhi.
8. R.L. Varshney & K.L. Maheshwari, Managerial Economics-Sultan Chand & Sons, New Delhi.

B. COMPUTER APPLICATIONS IN BUSINESS

UNIT-I : COMPUTER HARDWARE

CPU, Input devices, Output Devices, Communication devices, storage devices Types of Computer system.

UNIT-II : INFORMATION TECHNOLOGY

Basic idea of LAN (Local Area Network), and WAN (Wide Area Net work) E-mail: Internet Technologies, Access Devices, Concept of World Wide Web and Internet browsing.

UNIT-III : WORD PROCESSING

Introducing and working with MS Word in MS-Office - Word Basic Commands, Formatting - Text and documents, Sorting and Tables, Working with graphics, introduction to Mail merge.

UNIT-IV : SPREAD SHEET

Working with EXCEL - Formatting functions, chart features, working with graphics in EXCEL using worksheets as database in accounting, Marketing, finance and personnel areas.

UNIT-V : PRESENTATION WITH POWER POINT

Power Point, basics creating Presentation of easy way: working with graphics in Power Point show time, sound effect and animation effects.

Reference Books

1. Date, C.J: An Introduction to Data base systems, Addison Wesley, Massachusetts.
2. Dienes, Sheih.S: Micro soft Office, Professional for Windows 95: Instant Reference: BPB Publication, New Delhi.
3. Mansfield, Ron: The Compact Guide to Micros soft Office BPB Publicaton, New Delhi.
4. O.Brian...A: Management information System, Tala Mc Graw Hill, Delhi.
5. Ullman, J.O: Principles of Data base System, Galgoia publication, New Delhi.

C. INSURANCE AND RISK MANAGEMENT

UNIT-I

Risk and Risk management process - risk identification - evaluation-risk management techniques-Insurance and risk management techniques-selecting and implementing risk management techniques.

UNIT-II

Commercial risk management applications - property - liability-commercial property insurance - different policies and contracts-business liability and risk management insurance-workers compensation and risk financing.

UNIT-III

Personal risk management - applications-property and liability- risk management for auto owners- Lorry owners- risk management for homeowners.

UNIT-IV

Risk management applications-loss of health - medi-claim-retirement planning and annuities-employee benefits- financial and estate planning.

UNIT-V

Risk management environment - Insurance industry - functions and organization of insurers-Government regulation of insurance sector - IRDA-privatization of insurance business in India-changes in insurance act-Insurance intermediaries-insurance products-pricing-claim valuation-Foreign insurers in India

Reference Books

1. Anand Gangly, Insurance Management, New age International, 2002
2. Arthur C Williams, Risk Management and Insurance, 8th Ed, McGraw Hill Co.
3. Insurance Act - Latest edition.

SEMESTER II

PAPER - 5

CORPORATE LAWS

UNIT-I

Corporate Laws: Importance - objectives. Doctrine of indoor Management. Liability of Misstatement - Mergers and Acquisitions.

UNIT-II

Information Technology Act: Intellectual Property Rights - Patents Act - Foreign Exchange Management Act - 2000 (FEMA) - Competition Act - 2002.

UNIT-III

SEBI ACT SEBI Regulations - Corporate Governance - Transparency and Disclosures - Latest trends. Audit Committee. Nolin Committee

UNIT-IV

ENVIRONMENT PROTECTION ACT - 1986. Power of Government - Air (Prevention and Control of Pollution) Act, 1981. Water (Prevention and Control of Pollution) Act, 1974.

UNIT-V

CONSUMER PROTECTION ACT, 1986-Competition Act 2002-Definitions-Competitive agreements-Abuse of dominant position-combination-regulation of combinations-competition commission of India, duties, Powers and functions of Commission-Competition Appellate Tribunal.

Reference Books

1. N.D. Kapoor, Elements of Company Law, Sultan Chand & sons, New Delhi.
2. Company Acts, 1956 (Acts and Rules).
3. N.D. Kapoor, Elements of Mercantile Law, Sultan Chand & sons, New Delhi.
4. Gulshan, S.S. A Hand book of Corporate Laws, S. Chand & Co, New Delhi.
5. Kuchhal, M.C. Mercantile Law, Vikas Publishing House, New Delhi.
6. Shukla, M.C. a Manual of Mercantile Law, S. Chand & Co., New Delhi.

PAPER - 6

HUMAN RESOURCE MANAGEMENT

UNIT-I

Humans and other physical resources - development of the human potential - Implications of Behavioral Science theories to HRM - Link between organization planning and HR planning.

UNIT-II

Acquisitions and maintenance of personnel - recruitment and selection - purposes and methods of recruitment and selection - Maintenance of personnel - motivation for increased productivity - Q W L.

UNIT-III

Rewards and incentives - financial and non-financial incentives - Grievance procedure - conflict - process - stress vs. challenge - sources - resolution.

UNIT-IV

Performance appraisal - Ranking, rating scales, critical incident method - MBO as a method of appraisal - Removing subjectivity from evaluation - Criteria for promotions and job enrichment.

UNIT-V

Human development - training - need and importance - methods of training - designing training program - Evaluation of training program - Executive development. - Organization change - change agents - resistance to change - managing the resistance.

Reference Books

1. Dressler- Human Resource management, 8th Ed. Pearson Education, 2002
2. De Cenzo and Robbins, Personnel/Human Resource Management, Prentice Hall of India, 1998.
3. S.K.Chakraborty, Values and Ethics for Organization, Oxford University Press 1999.
4. Aswathappa, Human Resource and Personnel Management, TataMcGraw Hill, NewDelhi, 2002.
5. A.M. Sheikh, Human Resource Development and Management, S. Chand & Co, New Delhi.

PAPER - 7

ADVANCED ACCOUNTS

Objectives

The primary objective of this subject is to enlighten the students the theoretical aspects of different topics and special attention to chapters like Inflation accounting, Holding Companies, Bank and Insurance Company accounts.

UNIT-I

Accounts of Banking Companies - Legal Provisions - Capital Adequacy Norms - Rebate on Bills Discounted - Asset Classification and Provisioning - Preparation of Final accounts.

UNIT-II

Insurance Company Accounts - Nature of Insurance Business - Distinction between Life and Non Life Insurance - Accounts of Life Insurance Business - Accounts of General Insurance Business - IRDA Regulations Regarding Preparation of Financial Statements.

UNIT-III

Holding Company Accounts - Consolidated Financial Statements - Consolidation of balance Sheets and Profit and Loss Accounts.

UNIT-IV

Inflation accounting - Need - Objections - Adjustments for General Price Changes - Current Purchasing Power Accounting (CPP) - CPP method of preparing financial statements.

UNIT-V

Human Resource Accounting - Need and Development - Importance of Human Resource Accounting - Objections against Human Resource Accounting - Human Resource Accounting in India. Corporate Social Reporting - Concept and objectives of social responsibility.

Reference Books

1. M C Shukla and T S Grewal, Advance accounts, S.Chand & Co New Delhi
2. Anjan Bhattacharya & Subrata Mukerjee, Advanced Practical Accounts, S. Chand & Co., New Delhi.

PAPER - 8

QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

UNIT-I

Linear programming and net work analysis- PERT and CPM- Simplex method- Application of simplex technique.

UNIT-II

Inventory models- General concepts and definitions-Variations cost concepts-The technique of inventory control-EOQ models.

UNIT-III

Transportation model-Definitions-Formulation and solution of Transportation models-North west corner - MMM-VAM.

UNIT-IV

Assignment model - Definitions- Formulation and solution of Assignment models-simplex and Hungarian method.

UNIT-V

Queuing theory-meaning-objectives - Limitations-Elements of queuing system-Queuing models.

Note: The proportion between theory and practice shall be 20:80

Reference Books

1. C.R.Kothari, Quantitative Techniques, Vikas publishing house.
2. P.R.Gupta and man Mohan, Operation Research, Sultan Chand and sons, New Delhi.
3. J.K. Sharma, Mathematical Models in operation research, TMH publishers.
4. Business statistics and operations research, Dr D Joseph anbarasu Lintec Press Trichy.

ELECTIVE
PAPER - 2
RETAIL MANAGEMENT

COURSE OBJECTIVE:

The objective of the course is providing insights on retail operations. This will enable the students to become good retail planners and decision makers and help focus on change and adaption to change

Unit-I

Introduction to retail: retail in India; retail models and theories of retail development; understanding the retail consumers; ethical issues in retailing

Unit-II

Retail marketing strategy; retail franchising; retail store location and site selection; retail store design and visual merchandising; customer relationship management in retailing.

Unit-III

Basics of retail merchandising; the process of retail merchandising; the method of merchandise

Procurement; retail pricing and evaluating merchandise performance; retail communication mix

Unit-IV

Retail store operations; servicing the retail customers; retail human resource management; financial aspects of retail management; retail information system; supply chain management in retailing

Suggested Reading:

1. Pradhan, Swapna; Retailing Management; Tata McGraw Hill; New Delhi
2. Bajaj, Chetan, Tuli, Rajnish and Srivastava, Nidhi; Retail Management; OUP; New Delhi
3. Berman, Barry & Evans, Joel R.; Retail Management – A strategic approach; Pearson Education/Prentice Hall of India; New Delhi
4. Levy, Michael & Weitz, Barton A.; Retailing Management; Tata McGraw Hill; New Delhi
5. Newman, Andrew J. & Cullen, Peter; Retailing – Environment and Operations; Thomson Asia Pvt. Ltd.; New Delhi
6. Dunne, Patrick M., Lusch, Robert F & Griffith, David A.; Retailing; Thomson Asia Pvt. Ltd; ND
7. Lamba, A.J.; The Art of Retailing; Tata McGraw Hill; New Delhi

A. E-COMMERCE

UNIT-I : ELECTRONIC COMMERCE

Meaning - Traditional Commerce - E. Commerce and its application in business. Basic Blocks of E. Commerce. E. Commerce consumer - Anatomy of E. Commerce.

UNIT-II : NETWORK INFRASTRUCTURE

Global Information Distribution Networks - Components of the I - way - Policy issues- Internet terminology - Internet Governance - An overview of Internet Applications.

UNIT-III : NETWORK LAYERS

Internet Protocol (IP) - Transmission Control Protocol (TCP) - Multimedia Concepts - Advantages of Internet. Electronic Data Interchange (EDI) - EDI and E. Commerce - EDI application in Business.

UNIT-IV : NETWORK SECURITY

Client Server Network security - Firewalls and Network Security - data and message Security - encrypted documents and Electronic Mail. Video conferencing.

UNIT-V : DIGITAL DOCUMENTS

Document Library - Types of Digital Documents - Corporate data warehouse - Electronic Payment Scheme - Intra-organizational Electronic Commerce.

References Books

1. David Kosiur, understanding Electronic Commerce, Addison Wesley, 1996.
2. Soka, From EDI to Electronic Commerce, Tata McGraw – Hill, 1995.
3. Saily Chan, Electronic Commerce Management, John Wiley, 1998.
4. Neil Randall, The Internet in a Wee, 2nd Edn. Prentice Hall of India, New Delhi.
5. Kamalesh, K. Balaji and Debjani Nag, “E-Commerce”, the cutting edge of business, Tata McGraw – Hill, 2000.
6. Marilyn Greenstein and Todd M. Fein Mann, Electronic Commerce, Security, Risk Management, Irwin McGraw Hill, 2000.

B. BANK MANAGEMENT

UNIT-I

Banking structure in India - banking functions and services - Foreign commercial banks - Private commercial banks - capital adequacy.

UNIT-II

Principles of lending - financial adequacy assessing the borrower - project appraisal - structural and Infrastructural analysis - legal formalities - follow up loans, asset management companies.

UNIT-III

Non Performing Assets (NPAs) - Early Warning Signals - Management of NPAs- Remedies Available - Recent Measures - loan recovery tribunals - Provisions of Revenue Recovery Act

UNIT-IV

Investment management - priorities in allocation of bank funds - investment in governments securities - maturity and yield - quality and diversification, profitability management - profit planning

UNIT-V

Traditional Banking vs. E-Banking - facets of E-Banking - Internet Procurement - E-Banking Transaction - Electronic Delivery Channels - Truncated Cheque - Complete Centralized Solution - Features of CCS - Advances of E-Banking - Constraints in E-Banking - Security Measures.

Reference Books

1. Varshney, PN. Banking Law & Practice, Sultan Chand, New Delhi.
2. S.N.Maheswari, Banking Law & Practice, Ludiana, Kalyani Publications.
3. Vasant Desai, Principles of Bank Management, Mumbai, Himalaya Publications.
4. K.Subramanian, Banking Reforms in India, TMH, New Delhi.
5. Joseph Sinkey, Commercial Bank Financial Bank Financial Management, Pearson Education (Prentice Hall)
6. E.Gordon and Dr. K. Natarajan, Banking Theory Law and Practice – Himalaya Publishing House.

SEMESTER III

PAPER - 9

Basics of GST

Unit I

GST - The Road Begins -Draft Model GST Law - Positives –Negatives- LEVY - Territorial jurisdiction of GST - Taxable Event - Consideration - Levy and collection of GST - Composition levy - PLACE AND TIME OF SUPPLY - Definitions of Goods & Services - Time of supply.

Unit II

VALUATION - Value of taxable goods and services- Valuation Rules -SPECIAL TRANSACTIONS - Job work - Electronic Commerce -INPUT TAX CREDIT - Input tax credit - Input Service Distributor -REFUNDS - Refund -Interest on refund.

Unit III

COMPLIANCES - Registration - Invoices, credit and debit notes - Payment of tax - Tax deducted at source - Returns - Accounts and Records - ASSESSMENT, AUDIT AND INSPECTION - Assessment - Audit - Inspection - INTEREST, PENALTY AND PROSECUTION - Interest - Offences and Penalties – Prosecution.

Unit IV

DEMAND AND APPEALS - Demand - Appeals - CGST - SGST -IGST-ALTERNATE DISPUTE RESOLUTION MECHANISM - Authority of Advance Ruling - Settlement of cases.

Unit V

RECOVERY AND LIABILITY TO PAY TAX - Recovery of tax - Liability to pay tax in specified cases - TRANSITIONAL PROVISIONS -Transitional Provisions.

Author : [Nitya Tax Associates](#) ,Taxmann Publications.

PAPER - 10

ORGANISATIONAL BEHAVIOUR

UNIT-I

Organizational Behavior - Fundamental concepts - nature and scope - OB in the new millennium - Foundations of Individual behavior - Personality, Perception, Learning, Values and Attitudes.

UNIT-II

Motivation - Early theories - Contemporary theories - Motivation at work - Designing and Motivating for jobs.

UNIT-III

Group Dynamics - Group Behaviour, - Inter-group relations - Communication and Group - Decision making.

UNIT-IV

Leadership - Trait, behaviour and contingency theories- Power and Politics - Conflict - causes, conflict management, Transactional Analysis (TA) - Work Stress.

UNIT-V

Organizational Structure And Design: Organizational changes and development - Organizational culture and climate -Organizational effectiveness.

Reference Books

1. Stephen Robbins, Organisational Behaviour, 0th Ed. Pearson Education, 2001
2. Fred Luthans, Organizational Behavior, McGraw Hill, 1998
3. Wagner, Organizational Behaviour, Thomson Learning, 2002.
4. S.S. Khanka, Organisational Behaviour, S.Chand & Co.,New Delhi Edn,2007
5. Dr. S. Shajahan & Linu shajahan, Organisational Behaviour, New age International Publishers, New Delhi.

PAPER - 11
ADVANCED COST ACCOUNTING

Objectives

The aim of the cost accounting is to acquaint the students with various concepts, methods of costing and decision making

UNIT-I

Nature and significance of cost accounts-Definition of Costing, Scope, Objectives, Functions and limitations of cost accounting-Installation of costing system-Elements of Cost- Cost centre and profit centre-Preparation of Cost sheet, tender of quotations.

UNIT-II

Methods of Costing-Process costing, Treatment of equivalent production- Inter process profit-Joint and by product Costing-Preparation of contract account, Cost plus contract and escalation clause.

UNIT-III

Standard Costing and Variance analysis-Material, Labor and Overheads -reporting of variances

UNIT-IV

Cost control and Cost Reduction-Control over wastages, Scrap, Spoilage and defectives-Methods of cost reduction.

UNIT-V

Activity based costing-Meaning and concept-Characteristics of ABC-Benefits from adoption of ABC-Just in Time Costing (JIT)

Note: The proportion between theory oriented and problem oriented questions in the university examination shall be 20:80

Reference Books

1. S.P. Jain and K.L. Narang-Cost accounting-Kalyani Publishers-New Delhi.
2. B.K. Bhar- Cost Accounting-Academic publishers, Calcutta
3. T.S.Reddy and Y.H. Reddy- Cost and Management Accounting-MargamPublications, Chennai
4. C.T.Horangren-Cost Accounting - A Managerial Emphasis- Pearson education-New Delhi
5. Jawaharlal - Cost Accounting-Tata Mc. Graw Hill
6. Ravi M Kishore Advanced Management Accounting - Taxman's-New Delhi.
7. Robert S. Kaplan-Anthony A. Atkinson- Advanced Management Accounting - Prentice Hall of India-New Delhi
8. Weldon's Cost Accounting and Cost Methods - Mc. Donald and Evens Limited.

PAPER - 12

RESEARCH METHODOLOGY

UNIT-I : INTRODUCTION

Research - definition, characteristics, nature and scope. Various types of research - Formulation of research problem - Major steps in Research – Hypothesis - Research Design - Uses of social research.

UNIT-II : SAMPLING AND DATA COLLECTION

Sampling: Meaning, definition, need and types. Sampling errors - Merits and demerits of Sampling. Data collection: Sources of data; Primary and Secondary data. Procedure for data collection, Tool of data collection - Questionnaire – Interview-Schedule.

UNIT-III : DATA PROCESSING AND ANALYSIS

Processing of data: editing, coding and Tabulation - Problems - use of computer in social research. Analysis of data: Statistical analysis; diagrammatic and graphic representation. Interpretation of results.

UNIT-IV : STATISTICAL APPLICATIONS

Factor Analysis - bivariate and Multivariate Analysis. (Practical problems.)

UNIT-V : RESEARCH REPORTS

Structure and components - Types of Research Report, Good Research Report. Pictures and Graphs. Introduction to SPSS Package.

References Books

1. Wilkinson. T.S. & Bhandarkar. P.L. Methodology and Techniques of Social Research, Himalaya Publishing House, 2000, Mumbai.
2. Panneerselvam. R. Research Methodology, Prentice Hall of India, New Delhi, 2004.
3. Green, P.E., et al., Research for Marketing Decisions, 5th ed., Prentice-Hall of India, New Delhi, 1994.
4. Young, P.V., Scientific Social Survey and Research, Prentice Hall, 1949. New York.
5. Kothari.C.R. Research Methodology - Methods & Technology, New Age International Publisher, New Delhi
6. Gupta, S.P. Statistical Methods, Sultan Chand and sons, 1999, New Delhi
7. Gupta, C.B., An introduction to Statistics Methods, Vikas Publishing House, 1998, New Delhi.

ELECTIVE
PAPER - 3
FINANCIAL SERVICES

UNIT – I : Indian Financial System

Introduction – Structure of the Indian Financial System – Recent Development – Financial Services – Concept – Objectives – Importance – Characteristics – Types of Financial Services – Regulatory Framework – Problems in Financial Services Sector.

UNIT – II : Mutual Funds concept of Regulations

Introduction – Types – Advantages and Disadvantages – Mechanics of Mutual Fund Operations – Asset Management Company (AMC) – Net Asset Value – SEBI's New Regulations to Mutual Funds (1990).

UNIT – III : Capital and Money Markets and Stock Exchanges

Capital Market: Meaning – Functions – Importance – Players in Capital Market – Primary and Secondary Capital Market. Money Market: Definition – Features – Money Market Instruments – Capital Market Versus Money Market etc., NSE – OTCEI.

UNIT – IV : Factoring Services and Consumer Finance

Factoring Services: Introduction – Mechanics of Factoring – Types – Advantages and disadvantages – Players in factoring services – Factoring Vs Bills Discounting – RBI Guidelines for factoring – Constraints of Factoring Services in India – Forfeiting. Consumer Finance: Definition – Types – Credit Cards – Debit Cards – Mechanics of consumer Financing – Sources – Modes.

UNIT – V : Venture Capital and Credit Rating

Venture Capital: Concept – Features – Forms of Venture Capital – Phases – Functions – Advantages – Venture Capital Institutions. Credit Rating: Introduction – Rating Process – Credit Rating Agencies – CRISIL, ICRA, CARE, Credit Rating symbols.

Text Books:

1. Bhatia, B.S and G.S Batra, Management of Financial Service, Deep & Deep Publications, New Delhi, 1996.
2. Cornett, Saunders, Financial Markets and Institutions, 3rd Edition, Tata McGraw Hill, New Delhi, 2007.
3. Sasidharan, Mathews, Financial Services and System, 1st Edition, Tata McGraw Hill, New Delhi, 2008.

Reference Books:

1. Bhalla, V.K. : Management Financial Services, Anmol, New Delhi 2001.
2. Gordan, E and K Natrajan: Emerging Scenario of Financial Services, Himalaya Publishing House, 1997.
3. Saha, T.R and Mondal A: Indian Financial System & Financial Market Operation, New Central Book Agency (P)Ltd., 2004
4. Avadhani V.A Marketing of Financial Services of Markets, 3rd Edition, Himalaya Publishing House, Mumbai, 2007.
5. M.Y. Khan – Financial Services, 4th edition, Tata McGraw Hill, New Delhi, 2007.

A. Computer and Office management

Objectives:

To familiarize the students with the fundamental of computer and to implement the Principles of Computers in the business operations

UNIT-I

History of computers- Types-Generation- Features- Hardware-Software-CPU-Floppy drives- Hard disk-CD Rom- Keyboard- Printer- Magnetic tapes.

UNIT-II

External storage units-Net work attached storage device (NAS)-CD Media-Pen Drive- External Hard Disks-Classification -Applications-Use of computers in various fields

UNIT-III

Flow charting- data communication- LAN-WAN-INTERNET-INTRANET- E mail- Security of data- Anti virus programmes.

UNIT-IV

Word basics-Formatting- Working with Headers-Footers and footnotes-Tab and tables-working with graphics-Macros Mail merge.

UNIT-V

Excel basics-Formatting tips- Function- Chart features-Working with graphics-Excels command Macros using worksheet as data base- Power point Presentation.

Reference Books:

Sanchs H Donald, Computer concepts and applications, Sultan Chand & Sons, New Delhi.

Subash Mehta: Easy Computers, Wheeler Publishing company, New Delhi.

SERVICES MARKETING

UNIT-I

Growth of the Service Sector - Nature and Concept of Service - classification of services - Characteristics of Services and their marketing implications - Essential Elements of marketing mix in Service marketing.

UNIT-II

Marketing strategies for service firms with special reference to information, communication, consultancy, advertising, professional services, after sales service, recruitment training and tourism.

UNIT-III

Product support services - pricing of services - problems of Service quality management - Customer Expectations - innovation in services.

UNIT-IV

Marketing of financial services - nature - types - marketing of insurance - mutual fund - marketing for non - profit firms - Growth of financial services in India.

UNIT-V

CRM - identifying and Satisfying Customer needs - Relationship marketing - Customer Satisfaction - Managing Service Brands.

Reference Books

1. Christopher Lovelock, Services Marketing, Pearson Education.
2. E.G. - Bateson, Managing Service marketing - Text and Readings, Dryden press, Hidsdale
3. Philip Kotler and Paul N.Bloom, Marketing professional Services, Prentice hall, New Jersey.
4. Payne, the essence of Service Marketing, New Delhi, prentice Hall.
5. Helen Wood Ruffe, Services Marketing, Macmillan India, New Delhi.
6. Mary Ann pezzallo, Marketing Financial Services, Macmillan.
7. Dr.S.Gurusamy, Financial and Markets Vijay Nicole imprints private limited, Chennai.
8. Dr.B.Balaji, Services, Services Marketing and Management, S.Chand & Company Ltd., New Delhi.

SEMESTER IV
PAPER - 13
DIRECT TAXES

UNIT-I

Basic concepts - Definitions - Assesses - Assessment year - Previous Year - Income - Residential Status - Scope of Total Income - Exempted income - Agricultural income - Capital income and expenditure - Revenue Income and expenditure.

UNIT-II

Heads of Income - Income from Salaries - Income from House property - Income from Business or Profession - Depreciation.

UNIT-III

Income under the head capital gains - Income from other sources - Deductions from Gross Total Income.

UNIT-IV

Computation of Total Income - Individual - Firm - Companies - MAT - Tax Deducted at Source - Advance Tax - Interest payable - Set off and Carry forward of losses - PAN - Rates of Tax.

UNIT-V

Assessment Procedure - Income tax Authorities - Penalties - Assessment of Fringe Benefit Tax - An outline of Wealth Tax - Computation of Net wealth.

Note: The ratio between theory and problems shall be 40:60.

Reference Books

1. Jayakumar A. & C.Dhanapal - Income Tax Theory, Law and Practice – Learnetech Press, Trichy,
2. Gaur V.P & Narang K.L, Income Tax Law and Practice, Kalyani Publishers, New Delhi.
3. Dr. Vinod Sighania, Direct Taxes, Tax Man Publications, New Delhi.
4. Dinkar Pagare, Income Tax Law and Practice, Sultan Chand & Sons, New Delhi.

PAPER - 14

INVESTMENT MANAGEMENT

UNIT-I

Properties of financial assets - Financial Markets - Investments - Types - Characteristics - Objectives - Types of investors - Investment vs. Gambling, Speculation, Speculation Vs. Gambling.

UNIT-II

Nature and Scope of Security Analysis - Concept of Risk and Return - Measurement of Risk

UNIT-III

Fundamental analysis-Economic analysis, Industry Analysis and company Analysis- Technical analysis- Trend indications- Indices and moving average applied in technical analysis.

UNIT-IV

Valuation of Securities - Equity shares - Preference shares - Debentures - Bonds

UNIT-V

Efficient market Hypothesis - Random Walk Theory - Markowitz Theory - Sharpe's optimization solution - Dow Theory - CAPM model - SML, CML.

Note: Only theory questions.

Reference Books

1. Dr.Raganatham m & Madhumathi R. Investment analysis 7 Portfolio management. Person Education, New Delhi.
2. Dr.Bhalla V.K.Investment Management, S.Chand and Company, New Delhi.
3. Fisher & Jordan, Security analysis and portfolio management, Prentice Hall of India, New Delhi.
4. Sharpe, William and Gordon, Investments – Prentice hall of India, New Delhi.
5. Rustagi R.P, Investments Analysis and Portfolio management, Sultan Chand & Sons, New Delhi

PAPER - 15

PROJECT DEVELOPMENT

UNIT-I: PROJECT

Meaning and overview - Project Development Cycle - Capital Expenditure Decisions - Importance and Difficulties.

UNIT-II : PROJECT APPRAISAL

Aspects of Appraisal - Market Appraisal - Technical Appraisal - Financial Appraisal - Economic Appraisal. Project formulation. Feasibility Report.

UNIT-III : PROJECT COST AND MEANS OF FINANCE

Project cost - Social Cost and Social Benefit. Term Loans - Loans from Development banks - Assistance from Indian finance Corporations and international finance Corporations. External commercial borrowing.

UNIT-IV : PROJECT SELECTION

Selection of a suitable project - Programming - scheduling and Controlling Mechanism.

UNIT-V : PROJECT CONTROL

Time and cost control - Budgetary control - corrective and preventive actions. Risk Management functions.

References Books

1. Prasanna Chandra, Projects - Preparation, Appraisal, Budgeting and Implementation, 3rd ed. Tata McGraw- Hill Publishing Company Limited, New Delhi.
2. Dr. Gupta, C.B. & Dr. Srinivasan, N.P. Entrepreneurial Development, Sultan Chand & sons, New Delhi.
3. Bryce, M.D. Industrial Development: A Guide for Accelerating Economic Growth, McGraw- Hill, 1960 New York.
4. Varma, M.L. Foreign Trade Management in India, Vikas Publishing House, 1993, New Delhi.
5. Jeevanandam, C. Foreign Exchange, Sultan Chand & sons, 1994, New Delhi.

PAPER - 16

MARKETING RESEARCH

Objectives

The aim of the subject is to impart knowledge to the students on Market Research and the method of conducting such research.

UNIT-I

Marketing research-Nature, Scope and importance-Research proposal- Steps in marketing research.

UNIT-II

Research design- Exploratory research-Descriptive research-survey research.

UNIT-III

Data collection-Secondary data- primary data-types, merits and Limitations-Methods of collection- Processing of collected data-Management Information System.

UNIT-IV

Ethics in marketing research-Treatment of respondents, buyer and Researchers-International code of marketing research practice.

UNIT-V

Application of marketing research-product research-motivation Research-presentation of research project - Future of Marketing Research in India.

Reference Books

1. Philip Kotler-Marketing Management and Control-Asian perspectives-Prentice Hall of India 1999 (The Millennium Edition).
2. Boyd Harper W. and Ralph Westfall-marketing research-text and cases-Richard D. Irwin Inc. Indian Edition.
3. Schreir Fredric T. Modern Marketing research, World wide publishing company.Inc.
4. Dr.D.D Sharma - Marketing research-Sulthan Chand & Sons, New Delhi.
5. Donald Tull and Deli Hawkins, Marketing research, Macmillan.

ELECTIVE

PAPER - 4

A. BUSINESS ENVIRONMENT AND POLICY

UNIT-I

Business Environment: Cultural, social, political, technological, economic and legal environment - scanning - techniques of environmental forecasting - SWOT - Internal environment - their impact on policy formulation.

UNIT-II

Economic reforms in India - Liberalization - privatization and globalization - Competitive Strength of Indian industry - Impact of liberalization policy on different sectors - Foreign Investments policy in India.

UNIT-III

Multi-national corporations - Their participation in India - Their strategies, competitive strengths policies and performance.

UNIT-IV

Business policy and corporate strategy: Policies; Strategies and Tactics; Policies and procedures - Corporate strategy: alternatives - variations - Strategic choice, implementation.

UNIT-V

Business ethics and social responsibilities - relationship between business and society - Corporate power social accountability - Ethical issues and values in business - Corporate Social policies - issues and challenges - Ecological and environmental issues.

Reference Books

1. Wheelen, Concepts of Strategic Management and Business policy, 8th Ed. Pearson Education, New Delhi, 2002.
2. William Gluck & L R Jauch, Business Policy & Strategic Management, McGraw-Hill 2001.
3. Kazhmi Azhar, Business Policy, TMH, 2002.
4. Gupta, Liberalisation - its impact on Indian Economy, Macmillan, 2002.

B. INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT-I : INFORMATION TECHNOLOGY

Meaning - Definition - Types of Information System - Computer net works: Goals and uses of networks. Network Hardware and Software - Types of Networks - Protocols - Knowledge Management.

UNIT-II : ELECTRONIC BUSINESS

Computers - Internet business - Definition - Online Business - E.Business Categories - preparing to online business - Ethics of information technology. E. Business Applications - Business to Business (B2B) - Business to Customers (B2C) - Electronic Shopping.

UNIT-III : PAYMENT SYSTEM

Paying in the net: The Payment Business - Post-paid System - Instant-paid payment System - Pre-paid Payments System. The Open source Projects - Introduction to open hardware.

UNIT-IV : STORAGE AND DATA BASE

Foundation for interactivity - Multimedia and Knowledge storage Capacity - Compression and Decompression. Secondary Storage Devices Diskettes - Hard disks - Optical Disks - Magnetic tape.

UNIT-V : DATA BASE MANAGEMENT SYSTEM (DBMS)

Introduction to data base approach - objectives of data base and data base languages - Ethics of using Databases - Concerns about accuracy and privacy.

Reference Books

1. Saily Chan, Electronic Commerce Management, John Wiley, 1998.
2. Neil Randall, The Internet in a Wee, 2nd Edn. Prentice Hall of India, New Delhi.
3. Marilyn Greenstein and Todd M. Fein Mann, Electronic Commerce, Security, Risk Management, Irwin McGraw Hill, 2000.
4. David Kosiur, understanding Electronic Commerce, Addison Wesley, 1996.

C. SALES AND ADVERTISING MANAGEMENT

UNIT-I

Sales management-Meaning and Scope-Functions Sales and Planning-Sales policy-Sales organization-Sales Territories-Sales Quota-Selling process-Responsibilities of Sales manager

UNIT-II

Need for sales force- Recruitment and Selection of sales force-Training of salesmen- Qualities of a Good salesman

UNIT-III

Advertising-Scope and Function- Need for Advertising classification-Advertisement Planning and Organization-Ethical Issues in Advertising

UNIT-IV

Advertising Media- Role of Media-Types of Media-Merits and Demerits- Media Research- Evaluation and Effectiveness of Advertising.

UNIT-V

The Advertising budget-Advertising Agencies- Types of Legal framework of advertising- Self regulation of Advertising.

Reference Books

1. Ramasamy : V S Marketing Management, Macmillan
2. Davar: Salesmanship and Advertising
3. Pillai and Bagavathi: Salesmanship.
4. Richard R Still and Edward W Gundiff- Sales management- Prentice Hall

**THIRUVALLUVAR UNIVERSITY
VELLORE - 632 115**

MASTER OF SCIENCE

M.Sc. CHEMISTRY DEGREE COURSE

**UNDER CBCS
(With effect from 2017 - 2018)**



REVISED SYLLABUS SUBMITTED

ON

DECEMBER - 2016

M.Sc. Chemistry: Syllabus (CBCS)

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THIRUVALLUVAR UNIVERSITY
MASTER OF SCIENCE
M.Sc. CHEMISTRY
DEGREE COURSE
UNDER CBCS
(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S. No. | Study Components | | Ins. Hrs/ week | Credit | Title of the Paper | Maximum Marks | | |
|-----------------------------------|-------------------|---------|----------------------|--------|--|---------------|--------------|-------|
| | Course Title | | | | | | | |
| 1 ST YEAR- SEMESTTER I | | | | | | CIA | Uni. Exam | Total |
| 1 | MAIN | Paper-1 | 4 | 4 | Organic Chemistry- I | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 4 | 4 | Inorganic Chemistry- I | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 4 | 4 | Physical Chemistry- I | 25 | 75 | 100 |
| 4 | MAIN PRACTICAL | Paper-1 | 5 | 0 | Organic Chemistry Practical- I | - | - | - |
| 5 | MAIN PRACTICAL | Paper-2 | 5 | 0 | Inorganic Chemistry Practical- I | - | - | - |
| 6 | MAIN PRACTICAL | Paper-3 | 5 | 0 | Physical Chemistry Practical- I | - | - | - |
| 7 | ELECTIVE | Paper-1 | 3 | 3 | (to choose 1 out of 3) A. Advanced Polymer Chemistry B. Heterocyclic Chemistry C. Materials Chemistry | 25 | 75 | 100 |
| | | | 30 | 15 | | 100 | 300 | 400 |

| | | | | | | | | |
|---|-------------------|---------|---|---|----------------------------------|------------|----------------------|--------------|
| 1ST YEAR- SEMESTER II | | | | | | CIA | Uni. Exam | Total |
| 8 | MAIN | Paper-4 | 3 | 3 | Organic Chemistry- II | 25 | 75 | 100 |
| 9 | MAIN | Paper-5 | 3 | 3 | Inorganic Chemistry- II | 25 | 75 | 100 |
| 10 | MAIN | Paper-6 | 4 | 4 | Physical Chemistry- II | 25 | 75 | 100 |
| 11 | MAIN PRACTICAL | Paper-1 | 5 | 5 | Organic Chemistry Practical- I | 25 | 75 | 100 |
| 12 | MAIN PRACTICAL | Paper-2 | 5 | 5 | Inorganic Chemistry Practical- I | 25 | 75 | 100 |
| 13 | MAIN PRACTICAL | Paper-3 | 5 | 5 | Physical Chemistry Practical- I | 25 | 75 | 100 |

| | | | | | | | | |
|----|------------------|---------|-----------|-----------|--|------------|------------|------------|
| 14 | Compulsory paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 15 | ELECTIVE | Paper-2 | 3 | 3 | (to choose 1 out of 3) A. Green Chemistry B. Supramolecular and Nanochemistry C. Modern Separation Techniques | 25 | 75 | 100 |
| | | | 30 | 30 | | 200 | 600 | 800 |

| 2nd YEAR- SEMESTER III | | | | | | CIA | Uni. Exam | Total |
|--|----------------|---------|-----------|-----------|---|------------|------------------|--------------|
| 16 | MAIN | Paper-7 | 4 | 4 | Organic Chemistry- III | 25 | 75 | 100 |
| 17 | MAIN | Paper-8 | 4 | 4 | Inorganic Chemistry- III | 25 | 75 | 100 |
| 18 | MAIN | Paper-9 | 4 | 4 | Physical Chemistry- III | 25 | 75 | 100 |
| 19 | MAIN PRACTICAL | Paper-4 | 5 | 0 | Organic Chemistry Practical- II | - | - | - |
| 20 | MAIN PRACTICAL | Paper-5 | 5 | 0 | Inorganic Chemistry Practical- II | - | - | - |
| 21 | MAIN PRACTICAL | Paper-6 | 5 | 0 | Physical Chemistry Practical- II | - | - | - |
| 22 | ELECTIVE | Paper-3 | 3 | 3 | (to choose 1 out of 3) A. Scientific Research Methodology B. Advanced Bioinorganic Chemistry C. Advanced analytical techniques | 25 | 75 | 100 |
| | | | 30 | 15 | | 100 | 300 | 400 |

| 2nd YEAR- SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
|---|----------------|----------|---|---|-----------------------------------|------------|------------------|--------------|
| 23 | MAIN | Pape-10 | 4 | 4 | Organic Chemistry- IV | 25 | 75 | 100 |
| 24 | MAIN | Paper-11 | 4 | 4 | Inorganic Chemistry- IV | 25 | 75 | 100 |
| 25 | MAIN | Paper-12 | 4 | 4 | Physical Chemistry- IV | 25 | 75 | 100 |
| 26 | MAIN PRACTICAL | Paper-4 | 5 | 5 | Organic Chemistry Practical- II | 25 | 75 | 100 |
| 27 | MAIN PRACTICAL | Paper-5 | 5 | 5 | Inorganic Chemistry Practical- II | 25 | 75 | 100 |
| 28 | MAIN PRACTICAL | Paper-6 | 5 | 5 | Physical Chemistry Practical- II | 25 | 75 | 100 |

| | | | | | | | | |
|----|----------|---------|-----------|-----------|---|------------|------------|------------|
| 29 | ELECTIVE | Paper-4 | 3 | 3 | (to choose 1 out of 3) A. Environmental Chemistry B. Inorganic Photochemistry C. Medicinal Chemistry and Drug Design | 25 | 75 | 100 |
| | | | 30 | 30 | | 175 | 525 | 700 |

| SUBJECT | PAPERS | CREDIT | TOTAL CREDIT S | MARKS | TOTAL MARKS |
|-------------------------|---------------|---------------|-----------------------|--------------|--------------------|
| MAIN PAPER | 12 | 3-4 | 46 | 100 | 1200 |
| MAIN PRACTICAL | 6 | 5 | 30 | 100 | 600 |
| ELECTIVE PAPER | 4 | 3 | 12 | 100 | 400 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| TOTAL | 23 | - | 90 | - | 2300 |

Note:

1. Theory Papers: Internal 25 marks; External 75 marks
2. Practical Papers: Internal 25 marks; External 75 marks

THIRUVALLUVAR UNIVERSITY
M.Sc. CHEMISTRY
SYLLABUS
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FIRST YEAR

SEMESTER I
PAPER - 1
ORGANIC CHEMISTRY I

OBJECTIVES:

To make the students learn and understand the concept of stereochemistry, conformational analysis and their application in the determination of reaction mechanism. To understand the mechanism of nucleophilic and electrophilic substitution reactions.

UNIT-I: STEREOCHEMISTRY

Optical activity and chirality, classification of chiral molecules as asymmetric and dissymmetric. A brief study of dissymmetry of allenes, biphenyls, spiro compounds, trans-cyclooctene, cyclononene and molecules with helical structures. Absolute configuration - R, S notation of biphenyls and allenes. Fischer projection. Inter conversion of Sawhorse, Newman and Fischer projections. Erythro and threo nomenclature, E and Z nomenclature - Asymmetric synthesis - Cram's rule.

UNIT-II: CONFORMATIONAL ANALYSIS

Conformational analysis of disubstituted cyclohexane and their stereochemical features (geometrical and optical isomerism (if shown) by these derivatives). Conformation and reactivity of substituted cyclohexanol (oxidation and acylation), cyclohexanone (reduction) and cyclohexane carboxylic acid derivatives (esterification and hydrolysis). Conformation and stereochemistry of cis and trans-decalin and 9 - methyldecalin.

UNIT-III: ALIPHATIC SUBSTITUTION REACTIONS

Nucleophilic substitution reactions: S_N1 , S_N2 and S_{Ni} mechanisms - Neighboring group participation – Reactivity - structural and solvent effects - substitution in norbornyl and bridgehead systems - substitution at allylic and vinylic carbons - substitution by ambident nucleophiles - substitution at carbon doubly bonded to oxygen and nitrogen - alkylation and acylation of amines, halogen exchange, Von-Braun reaction, alkylation and acylation of active methylene carbon compounds, hydrolysis of esters, Claisen and Dieckmann condensation.

Electrophilic substitution reactions: S_E1 , S_E2 and S_{Ei} mechanism, double bond shift - Reactivity. Migration of double bond, keto-enol interconversion, Stark- Enamine reaction, halogenation of aldehydes and ketones and decarboxylation of aliphatic acids.

UNIT-IV: ELIMINATION REACTIONS

$E1$, $E2$ and $E1cB$ mechanism - $E1$, $E2$ and $E1cB$ spectrum - Orientation of the double bond - Hoffman and Saytzeff rules - Competition between elimination and substitution. Typical elimination reactions- dehydration, dehydrohalogenation and dehalogenation. Stereochemistry of $E2$ eliminations in cyclohexane systems. Mechanism of pyrolytic eliminations. Chugaev and Cope eliminations.

UNIT-V: AROMATIC SUBSTITUTION REACTIONS

Electrophilic substitution reactions: The arenium ion mechanism. Orientation and reactivity (ortho, meta and para directing groups). Typical reactions including Reimer - Tieman reaction, Vilsmeier - Haack, Gattermann, Gattermann - Koch reaction and Kolbe reaction. Synthesis of di and tri substituted benzene (symmetrical tribromo benzene, 2-amino-5-methyl phenol, 3-nitro-4-bromobenzoic acid, 3, 4- dibromonitrobenzene and 1, 2, 3 - trimethylbenzene) starting from benzene or any monosubstituted benzene.

Nucleophilic substitution reactions: Mechanisms: S_N1 , S_{NAr} and Benzyne mechanisms. Methods for the generation of benzyne intermediate and reactions of aryne intermediate. Nucleophilic substitution involving diazonium ions. Aromatic nucleophilic substitution of activated halides, Ziegler alkylation and Chichibabin reaction.

Recommended Books

1. C. Wentrup, Reactive Molecules, John Wiley and Sons, New York (1984).
2. C.K. Ingold, Structure and mechanism in organic chemistry, Cornell University press.
3. E. S. Gould, Mechanism and Structures in Organic Chemistry, Holt, New York (1959).
4. Ernest Eliel, Stereochemistry of carbon compounds, McGraw Hill, New York (1962).
5. Francis A. Carey and Richard J. Sundberg, Advanced Organic Chemistry, Part A and B, III Edition, Plenum Press (1990).
6. Graham Solomons, Organic Chemistry.
7. J. March, Advanced organic reaction mechanism and structure, Tata McGraw Hill.
8. J. Miller, Advanced Organic Chemistry, III Edition.
9. J. Miller, Aromatic Nucleophilic Substitution
10. Longman, A Guide book to mechanism in organic chemistry.
11. Marc London, Organic Chemistry.
12. Nasipuri, Stereochemistry, Alhed Publishers, 2003.
13. Mc Murry, Organic Chemistry, V Edition, Asian Books Pvt Ltd (2000).
14. Niel Isaacs, Physical Organic Chemistry, ELBS Publications (1987).
15. P. Ramesh, Basic principles of Organic Stereochemistry, Madurai Kamaraj University.
16. P. S. Kalsi, Stereochemistry and mechanism through solved problems, Wiley Eastern Ltd., (1994).
17. P. S. Kalsi, Stereochemistry, Conformation analysis and Mechanism, II Edition, Wiley Eastern Limited, Chennai (1993).
18. R. K. Bansal, Organic Reaction Mechanism.
19. R.O.C. Norman, Organic Synthesis, Chapman and Hall, New York (1980).
20. S. M. Mukherji and S.P. Singh, Organic Reaction Mechanism, MacMillan India Ltd., Chennai (1990).
21. Stanley. H. Pines, Organic Chemistry, 5th Edn, McGraw Hill International Edition. 1987.
22. T. L. Gilchrist and C.W. Rees, Carbenes, Nitrenes and Arynes, Thomas Nelson and Sons Ltd., London.
23. Peter Sykes, A Guide book to mechanism in organic chemistry, Pearson Edition (2006).
24. C. N. Pillai, Textbook of Organic Chemistry, University press (India) private Ltd (2009).

PAPER -2
INORGANIC CHEMISTRY I

OBJECTIVES:

To learn about the inorganic polymers. To study the concept of coordination chemistry, stability of the complexes and stereochemistry of complexes. To know about the structure and bonding of inorganic compounds.

UNIT-I: STRUCTURE AND BONDING - I

Polyacids: Isopolyacids and heteropolyacids of vanadium, chromium, molybdenum and tungsten.

Inorganic Polymers: Silicates, structure - properties - correlation and applications - molecular sieves, polysulphur - nitrogen compounds and poly – organophosphazenes

UNIT-II: STRUCTURE AND BONDING - II

Boron hydrides: Polyhedral boranes, hydroboration, carboranes and metallocarboranes.

Metal clusters : Chemistry of low molecularity metal clusters (upto) trinuclear metal clusters, multiple metal-metal bonds. Cubane clusters and Zintl clusters.

UNIT-III: COORDINATION CHEMISTRY - I

Stability of complexes; thermodynamic aspects of complex formation; factors affecting stability, HSAB approach. Determination of stability constants by spectrophotometric, polarographic and potentiometric methods.

UNIT-IV: COORDINATION CHEMISTRY - II

Stereochemical aspects; stereoisomerism in inorganic complexes; isomerism arising out of ligand distribution and ligand conformation; chirality and nomenclature of chiral complexes; optical rotatory dispersion and circular dichroism. Macrocyclic ligands; types; porphyrins; corrins, Schiff bases; crown ethers and cryptates.

UNIT-V: COORDINATION CHEMISTRY - III

Evidences for metal-ligand orbital overlap, molecular orbital theory and energy level diagrams, concept of weak and strong field ligands, Jahn-Teller distortion, charge - transfer spectra. Term states for “d”- ions, energy diagrams, d-d transitions, Orgel and Tanabe - Sugano diagrams, spin orbit coupling, nephelauxetic effect, spectral and magnetic characteristics of transition metal complexes.

TEXT BOOKS

1. F. A. Cotton and G.W. Wilkinson, Advanced Inorganic Chemistry– A comprehensive Text, John Wiley and Sons (1988).
2. J. E. Huheey, Inorganic Chemistry, Harper and Collins, NY, IV Edition, (1993).
3. K. F. Purcell and J. C. Kotz, Inorganic Chemistry WB Saunders Co., USA, (1977).
4. M. C. Shriver, P.W Atkins, CH. Langford, Inorganic Chemistry, OUP, (1990).
5. N. N. Greenwood and Earnshaw, Chemistry of the Elements, Pergamon Press, New York (1984).
6. N. H Ray, Inorganic Polymers, Academic Press, (1978)
7. S. F. A. Kettle, Coordination Chemistry, ELBS, (1973).

Suggested References

8. A. B. P. Lever, Inorganic Electronic Spectroscopy, II Edn., Elsevier, New York, (1984).
9. B.E. Douglas DH McDaniel's and Alexander, Concepts and Models of Inorganic Chemistry, Oxford IBH, (1983).
10. B.N. Figgis, Introduction to Ligand Fields, Interscience, (1966).
11. E.L. Muetterties, Polyhedral Boranes, Academic Press, New York (1975).
12. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., NY (1974).
13. W.U. Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, S. Chand and Co., New Delhi, (1992).
14. D. M.P.Mingos and D. J. Wales, Introduction to Cluster Chemistry, Prentice Hall, 1990.
15. R. Gopalan, Text book of Inorganic Chemistry, University press (India) private Ltd.

PAPER-3
PHYSICAL CHEMISTRY I

OBJECTIVE:

To study the partial molar property, fugacity and its significance. Theories and basic concepts of chemical kinetics - mechanism of acid, base and enzyme catalysis reaction. To acquire knowledge on phase equilibria of three component system. To study the basics of colloids.

UNIT-I: THERMODYNAMICS

Partial molar properties -Partial molar free energy (chemical potential), Partial molar volume and Partial molar heat content - Their significance and determination of these quantities. Variation of chemical potential with temperature and pressure.

Definition of fugacity - determination of fugacity by graphical method - variation of fugacity with temperature and pressure - the concept of activity and activity coefficients – determination of activity and activity coefficient by emf method - determination of activity and activity coefficients for non-electrolytes - determination of standard free energies - choice of standard states.

UNIT-II: PHASE EQUILIBRIA

Physical equilibria involving phase transition: Two component system - Congruent system (phenol-aniline) and Incongruent system (sodium chloride- water) - Peritectic reactions. Three component system: Solid - Liquid equilibria - hydrate formation (sodium chloride - sodium sulphate - water); Liquid - Liquid equilibria - one pair of partially miscible liquids (acetic acid - chloroform - water and alcohol - benzene - water); two pairs of partially miscible liquids (water - ethyl alcohol - succinic nitrile).

UNIT-III: COLLOIDS

Surface phenomena - surfactants, micellization, critical micelle concentration (CMC), factors affecting CMC of surfactants, micro emulsions, reverse micelles and surface films (electro kinetic phenomena).

Structure and stability of colloids - Zeta potential (derivation), electro osmosis, protective colloids, gold number, sedimentation potential, streaming potential and Donnan membrane equilibrium.

UNIT-IV: CHEMICAL KINETICS

Absolute Reaction Rate Theory (ARRT) - Potential energy surfaces - partition function and activated complex- Eyring equation - estimation of free energy, enthalpy and entropy of activation and their significance.

Reactions in solutions - effect of pressure, dielectric constant and ionic strength on reactions in solutions - kinetic isotope effects - linear free energy relationships. Hammett and Taft equation.

UNIT-V: CATALYSIS

Acid - Base catalysis - mechanism of acid - base catalyzed reactions - Bronsted catalysis law. Catalysis by enzymes - Kinetics of enzyme catalyzed reaction - Michaelis - Menten equation and its interpretation. Effect of substrate concentration, pH and temperature on enzyme catalyzed reactions - inhibition of enzyme catalyzed reactions - Competitive, Non-competitive and Uncompetitive inhibition.

TEXT BOOKS

1. S. Glasstone, Thermodynamics for Chemists, Affiliated East West Press, New Delhi (1950).
2. J. Rajaram and J. C. Kuriacose, Thermodynamics for Students of Chemistry, Lal Nagin Chand, New Delhi (1986).
3. Samuel Glasstone, Textbook of Physical Chemistry, Macmillan India Limited, 2nd Edition
4. Terence Cosgrove – Colloid Science - Principles, methods and applications
5. Robert J. Hunter - Foundations of Colloid Science, 2nd Edition
6. J. Rajaram and J.C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
7. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).

Suggested References

1. W. J. Moore, Physical Chemistry, Orient Longman, London (1972).
2. K. G. Denbigh, Thermodynamics of Steady State, Methien and Co. Ltd, London (1951).
3. K. Nash, Elements of Chemical Thermodynamics, Addison Wesley (1962).
4. Alexander and Johnson- "Colloid science"- Oxford University Press
5. R. G. Frost and Pearson, Kinetics and Mechanism, Wiley, New York (1961).
6. Amdur and G. G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
7. M.V. Sangaranarayanan and V. Mahadevan, Text book of Physical Chemistry, University press (2011).

**ELECTIVE
PAPER-I
(to choose 1 out of 3)**

A. ADVANCED POLYMER CHEMISTRY

OBJECTIVE:

To gain the knowledge in the preparation, properties, characterization and applications of polymers.

UNIT- I: BASIC CONCEPTS

Classification - Nomenclature and isomerism - functionality - Molecular forces and chemical bonding in polymers - molecular weight – linear, branched and cross linked polymers. Thermoplastic and thermosetting polymers - Elastomers, fibers and resins. Techniques of polymerization - bulk solution, emulsion and suspension.

UNIT- II: KINETICS AND MECHANISM

Kinetics and mechanism of polymerization - free radical, cationic, anionic and co-ordination polymerization (Ziegler-Natta Catalyst). Copolymerization - kinetics (Detailed Study). General characterization-kinetic chain length-degree of polymerization, chain transfer - initiators - inhibitors - retarders.

UNIT-III: A. STRUCTURE AND PROPERTIES

Structure - property relationship - mechanical properties, thermal properties - glass transition temperature - factors affecting glass transition temperature - crystallinity and melting point - related to structure.

B. POLYMER CHARACTERIZATION AND ANALYSIS

Crystalline nature - X-Ray diffraction - Differential Scanning Calorimetry (DSC) - Thermo Gravimetric Analysis - molecular weight determination - Osmometry (membrane), viscosity, ultra centrifuge and gel permeation chromatography.

UNIT-IV: INDUSTRIAL AND NATURAL POLYMERS

Important industrial polymers - preparation and application of polyethylene, poly vinyl chloride, poly urethanes, polytetrafluoro ethylene (TEFLON), nafion and ion - exchange resins. Importance of natural polymers - application and structures of starch, cellulose and chitosan derivatives.

UNIT-V: ADVANCES IN POLYMERS

Biopolymers - biodegradable polymers - biomedical polymers - poly electrolytes - conducting polymers - high temperature and fire retardant polymers - polymer blend - polymer composites - polymer nanocomposites - IPN inter penetrating network polymers - electroluminescent polymers.

TEXT BOOKS:

1. F. W. Bill Meyer. Text book of polymer science, III Edition, John Wiley and sons, New York.
2. P. J. Flory. Principles of Polymer Chemistry, Cornell Press (recent edition).
3. V. R. Gowarikar, B. Viswanathan, J. Sridhar, Polymer Science - Wiley Eastern, 1986.
4. F. S. Misra - Introduction to Polymer Chemistry, Wiley Eastern Ltd.,
5. P. Bahadur, N. V. Sastry, Principles of Polymer Science, Narosa Publishing House.
6. G. Odian, Principles of Polymerization, McGraw Hill Book Company, New York, 1973.
7. Charles E. Carraher, Jr, Seymour/Carraher's polymer chemistry. -- 7th Edition

Suggested References

1. Rudin, The Elements of Polymer Science and Engineering. Academic Press, New York, 1973.
2. E. H. Brawn, The Chemistry of High Polymers, Butter worth & Co., London, 1948.
3. G. S. Krishenbaum, Polymer Science Study Guide, Gordon Breach Science publishing, New York, 1973.
4. E. A. Coolins, J. Bares and E. W. Billmeyer, Experiments in Polymer Science, Wiley Interscience, New York, 1973

PAPER-1

B. HETEROCYCLIC CHEMISTRY

OBJECTIVES:

To know the student about chemistry of heterocyclic compounds. To understand the strategies for designing the chemical synthesis. To make the students knowledgeable in higher heterocycles.

UNIT I: NOMENCLATURE OF HETEROCYCLES

Introduction, nomenclature systems- systematic nomenclature system (Hantzsch – Widman system) and replacement nomenclature system for monocyclic, fused, spiro and bridged heterocycles. Aromatic heterocycles: Introduction, chemical behavior of aromatic heterocycles, classification (structural types). Criteria of aromaticity in heterocycles (bond lengths, dipole moments, empirical resonance energy, delocalization energy, Dewar resonance energy, chemical shifts and ¹H NMR spectra).

UNIT- II: NONAROMATIC HETEROCYCLES

Introduction, strain, bond angle strain, torsional strain and their consequences in small ring heterocycles, conformations of six membered heterocycles – molecular geometry, barriers to ring inversion, pyramidal inversion and 1,3 diaxial interactions. Stereoelectronic effect in saturated six membered heterocycles- anomeric effect, other related effects and attractive interactions through space.

UNIT III: SMALL RING HETEROCYCLES

Three membered and four membered heterocycles: Synthesis and reactions of aziridines, oxiranes, thiranes, azetidines, oxetanes and thietanes. Benzo- fused five membered heterocycles: Synthesis and reactions including medicinal applications of benzopyrroles, benzofurans and benzothiophenes.

UNIT- IV: MESO IONIC HETEROCYCLES

General classification, chemistry of some important meso-ionic heterocycles of type A and B and their applications. Six membered heterocycles with one heteroatom: Synthesis and reactions of pyrylium salts and pyrones and their comparisons with pyridinium and thiopyrylium salts and pyridones.

UNIT- V: HIGHER HETEROCYCLES

Six membered heterocycles with two or more heteroatom: Synthesis and reactions of diazines, triazines and tetrazines. Seven and large membered heterocycles: Synthesis and reactions of azepines, oxepines, thiepines and diazepines. Synthesis of five and six membered heterocycles with P, As, Sb and Bi.

Text book:

1. Heterocyclic Chemistry, Vol. 1-3, R. R. Gupta, M. Kumar and V. Gupta, Springer Verlag.

Suggested references:

2. The Chemistry of Heterocycles, T. Eicher and S. Hauptmann, Thieme.
3. Heterocyclic Chemistry, J. A. Joule, K. Mills and G. F. Smith, Chapman and Hall.
4. Heterocyclic Chemistry, T. L. Gilchrist, Longman Scientific Technical.
5. Contemporary Heterocyclic Chemistry, G. R. Newkome and W.W. Paudler, Wiley-Interscience.
6. An Introduction to the Heterocyclic Compounds, R. M. Acheson, John Wiley.
7. Comprehensive Heterocyclic Chemistry, A. R. Katritzky and C.W. Rees, eds. Pergamon press.

PAPER-1
C. MATERIALS CHEMISTRY

OBJECTIVES:

*To learn about different types of materials. To understand the classifications of materials.
To learn the advancements of material chemistry.*

UNIT-I: MULTIPHASE MATERIALS

Ferrous alloys: Fe-C phase transformation in ferrous alloys, stainless steels, non-ferrous alloys, properties of ferrous and non-ferrous alloys and their applications.

Glasses: Glassy state, glass formers, glass modifiers and applications.

Ceramics: Ceramic structures, mechanical properties, clay products, refractories-characterizations, properties and applications.

Composites: Microscopic composites- dispersion-strengthened and particle reinforces-fibre-reinforced composites and macroscopic composite.

Nanomaterials: Nanocrystalline phase- preparation- special properties and applications.

Thin films and Langmuir - Blodgett films: Preparation techniques; evaporation/sputtering and sol-gel methods. Photolithography, properties and application of thin films.

UNIT-II: LIQUID CRYSTALS

Mesomorphic behaviour, thermotropic liquid crystals, positional order, bond orientational order, nematic and smectic mesophases; smectic-nematic transition and clearing temperature-hornotropic, planar and schlieren textures, twisted nematics, chiral nematics, molecular arrangement in smectic A and smectic C phases, optical properties of liquid crystals. Dielectric susceptibility and dielectric constants.

UNIT-III: IONIC CONDUCTORS

Types of ionic conductors, mechanism of ionic conduction, interstitial jumps (Frenkel). Vacancy mechanism, diffusion super ionic conductors; phase transitions and mechanism of conduction in super ionic conductors, examples and applications of ionic conductors.

High T_c Materials: Defect perovskites, high T_c superconductivity in cuprates, preparation and characterization of 1-2-3 and 2-1-4 materials, anisotropy, normal state properties: temperature dependence of electrical resistance, optical phonon modes, super conducting state; heat capacity;

Coherence length, elastic constants, position lifetimes and microwave absorption - Applications of high T_c materials.

UNIT-IV: MATERIALS FOR SOLID STATE DEVICES

Rectifiers, transistors, capacitors- IV-V compounds, low dimensional quantum structures, optical properties.

Organic solids: Conducting organic solids, organic superconductors and magnetism in organic materials.

Fullerenes: doped fullerenes as superconductors.

Molecular devices: Molecular rectifiers and transistors, artificial photosynthetic devices, optical storage memory and switches-sensors.

Nonlinear optical materials: nonlinear optical effects. Second and third order - molecular hyper polarisability and second order electric susceptibility - materials for second and third harmonic generation.

UNIT-V: ADVANCED MATERIALS

Brief study of the following: Fiber reinforced plastics (FRP), fiber reinforced metals (FRM), metal matrix composites (MMC), surface acoustic wave (SAW) materials, ceramics and cermets, electrets and SMART materials.

BOOKS SUGGESTED:

1. Solid State Chemistry and its applications, Anthony R. West, (1998), John Wiley & Sons, New York.
2. Material Science and Engineering. An Introduction. W.D. Callister. Wiley.
3. Principles of the Solid State, H.V. Keer. Wiley Eastern.
4. Materials Science for Engineers: J. C. Anderson, K.D. Leaver, P. Leever and R.D. Rawlings, 5TH Edition, Nelson Thornes Ltd.
5. Thermotropic Liquid Crystals. Ed. G.W. Gray. John Wiley.
6. Handbook of Liquid Crystals. Kelker and Hafz. Chemie Verlag.
7. Materials science, M. Arumugam, Anuradha publications (2012), Chennai.
8. Materials Science, S. L. Kakani, Amit Kakani, (2006), New Age International (P) Limited, Publishers, Chennai.

9. Material Science and Engineering: A First Course, V. Raghavan, 5TH Edition (2007), Prentice-Hall of India (P) limited.
10. A.R. West, Solid State Chemistry and its Applications, (1984) John Wiley & Sons, Singapore.
11. C.N R. Rao and J. Gopalkrishnan, New Directions in Solid State Chemistry, (1997) Cambridge Univ. Press.
12. T. V. Ramakrishnan and C. N. R. Rao, Superconductivity Today, (1992) Wiley Eastern Ltd., New Delhi.
13. P. Ball, Designing the Molecular World: Chemistry at the Frontier, (1994) Princeton University Press.

SEMESTER II

PAPER - 4

ORGANIC CHEMISTRY II

OBJECTIVES:

To understand the nature of carbon-hetero atom multiple bond additions and the mechanism of a chemical reactions. To understand the techniques involved in the rearrangements and their synthetic utility. To know the methods of synthetic strategies and applications. To apply the knowledge of chemical reactions in organic synthesis.

**UNIT-I: ADDITION TO CARBON - CARBON AND CARBON – HETERO
MULTIPLE BONDS**

Electrophilic, nucleophilic and neighbouring group participation mechanisms - addition of halogen and nitrosyl chloride to olefins. Hydration of olefins and acetylenes. Hydroboration, hydroxylation, Michael addition, 1, 3 - dipolar additions, Simon - Smith reaction. Mannich, Stobbe, Darzen, Wittig, Wittig - Horner and Benzoin reactions. Carbenes and nitrenes: Methods of generation, structure, addition reactions with alkenes and insertion reactions.

UNIT-II OXIDATIONS AND REDUCTIONS

Mechanism - study of the following oxidation reactions - oxidation of alcohols - use of DMSO in combination with DCC and acetic anhydride in oxidising alcohols - oxidation of methylene to carbonyl, oxidation of aryl methane - allylic oxidation of olefins - ozonolysis - oxidation of olefinic double bonds and unsaturated carbonyl compounds - oxidative cleavage of C-C bond. Reduction: Selectivity in reduction of 4-t-butylcyclohexanone using selecterides. Hydride reductions - reduction with LiAlH_4 , NaBH_4 , tritertiarybutyloxyaluminium hydride, sodium cyanoborohydride, trialkyltin hydride and hydrazines.

UNIT-III: MOLECULAR REARRANGEMENTS

A detailed study with suitable examples of the mechanism of the following rearrangements: Wagner - Meerwein, Pinacol - Pinacolone, Demjanov, Dienone - phenol, Favorski, Baeyer - Villiger, Wolf, Stevens and Von Richter rearrangements.

UNIT-IV: MODERN SYNTHETIC METHODS, REACTIONS AND REAGENTS

Synthesis of simple organic molecules using acetylation and alkylation of enamines, Grignard reactions, Diels - Alder reaction, phosphorus and sulphur ylides, Robinson annulations. Retrosynthetic Analysis: Basic principles and terminology of retrosynthesis, one group and two group C-X disconnections, one group C-C and two group C-C disconnections, amine and alkene synthesis. Protection and deprotection of functional groups (R-OH, R-CHO, RCO-R, R-NH₂ and R-COOH). Uses of the following reagents: DCC, Trimethylsilyliodide, 1, 3-Dithiane (umpolung), and diisobutylaluminiumhydride (DIBAL).

UNIT-V: HETEROCYCLES, VITAMINS AND STEROIDS

Synthesis of imidazole, oxazole, thiazole, flavones, isoflavones, anthocyanins, pyrimidines (cytosine, uracil only) and purines (adenine, guanine only). Synthesis of vitamin-A₁ using Wittig method. Conversion of cholesterol to progesterone, estrone and testosterone.

Recommended Books

1. E. S. Gould, Mechanism and Structure in Organic Chemistry Holt, Rinehart and Winston Inc., 1959.
2. Francis A. Carey and Richard J. Sundberg, Advanced Organic Chemistry - Part B, 3rd Edition (1990).
3. H. O. House, Modern Synthetic Reactions, Benjamin Cummings Publishing Company, London (1972).
4. I. L. Finar, Organic chemistry, Vol. I and II, 5th Edition, ELBS Publication.
5. J. March, Advanced organic reaction mechanism and structure, Tata McGraw Hill.
6. Mc Murry, Advanced organic chemistry, Thomas Pvt. Ltd.,
7. Michael B. Smith, Organic Synthesis, McGraw Hill, International Edition (1994).
8. L.F. Fieser and M. Fieser, Organic Chemistry, Asia Publishing House, Bombay, 2000.
9. Michael Smith, Organic synthesis.
10. Parmer and Chawla, Organic reaction mechanisms, S. Chand and Co.,
11. Paul de Mayo, Molecular Rearrangements, Vol. I and II.
12. R. E. Ireland, Organic synthesis, Prentice Hall of India
13. R.O.C. Norman, Principles of organic synthesis, Chapman and Hall, London. 1980.

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14. Raymond K. Mackie and David M. Smith, Guide book to Organic synthesis, ELBS Publication.
15. S. M. Mukherji and S.P. Singh, Organic Reaction Mechanism, MacMillan India Ltd., Chennai (1990).
16. Stuart Warren, Work book for organic synthesis, The Disconnection Approach, John Wiley & Sons (Asia) Pvt. Ltd.
17. W. Carruther, Jain Coldham, Modern Methods of organic synthesis, IV Edition.
18. W. Carruthers, Some Modern Methods of Organic Synthesis, III Edition, Cambridge University Press, (1993).
19. C. N. Pillai, Textbook of Organic Chemistry, University press (India) private Ltd (2009).

PAPER – 5

INORGANIC CHEMISTRY II

OBJECTIVES:

To make the students knowledgeable in solid state chemistry. To equip the students for their future career in nuclear industry. To learn the chemistry of lanthanides, to learn about nanotechnology and use of inorganic compounds in biological chemistry.

UNIT-I: THE CHEMISTRY OF SOLID STATE

Structure of solids; Comparison of X-ray and Neutron Diffraction; structure of pyroovskite, cadmium iodide and nickel arsenide; spinels and antispinel, defects in solids, non-stoichiometric compounds. Electrical, magnetic and optical properties of solids, band theory. Semiconductors, superconductors, solid state electrolytes. Types of magnetic behaviour, dia, para, ferro, antiferro and ferrimagnetism, hysteresis. Solid state lasers, inorganic phosphors and ferrites.

UNIT- II: NUCLEAR CHEMISTRY-I

Nuclear properties: Nuclear spin and moments, origin of nuclear forces, Nuclear models: liquid drop model and nuclear shell model. Modes of radioactive decay: Orbital electron capture, nuclear isomerism, internal conversion. Detection and determination of activity by cloud chamber, nuclear emulsion, bubble chamber, Geiger-Muller, scintillation and Cherenkov counters.

Nuclear reactions: Types, cross section, compound nucleus theory, high energy nuclear, direct nuclear, photonuclear and thermonuclear reactions.

UNIT- III: NUCLEAR CHEMISTRY-II

Stellar energy: synthesis of elements, hydrogen burning, carbon burning. Nuclear reactors: fast breeder reactors, particle accelerators, linear accelerators, cyclotron and synchrotron. Radio analytical methods: Isotope dilution analysis, radiometric titrations, radio immuno assay. Neutron activation analysis.

UNIT-IV: THE CHEMISTRY OF LANTHANIDES, ACTINIDES AND NANOTECHNOLOGY

The chemistry of solid state, lanthanides and actinides, oxidation state, spectral, magnetic characteristics, coordination numbers, stereochemistry, nuclear and non-nuclear applications.

Nanotechnology: Introduction - preparatory methods, characterization, application as sensors, biomedical applications, application in optics and electronics.

UNIT-V: BIOINORGANIC CHEMISTRY

Transport proteins: Oxygen carriers, metalloenzymes, carboxy peptidase, carbonic anhydrase, redox process, iron-sulphur proteins, chlorophyll, salient features of the photo synthetic process, vitamin-B₁₂, role of sodium, potassium, calcium, zinc and copper; fixation of nitrogen, nitrogen cycle.

Text Books

1. A. R. West, Basic solid state chemistry, John Wiley, (1991).
2. S. Glasstone, Source Book on Atomic Energy, Van Nostrand Co., (1969).
3. G. Frielander, J. W. Kennedy and J. M. Miller, Nuclear and Radiochemistry, John Wiley and Sons (1981).
4. Hari Jeevan Arnikaar , Essentials of nuclear chemistry, New Age International (P) Ltd., (2005).
5. Hari Jeevan Arnikaar, Nuclear Chemistry Through Problems, New Age International (P) Ltd., (2007).
6. G. T. Seaborg, Transuranium elements, Dowden Hitchinson and Ross, (1978).
7. Nishit Mathur, Nanochemistry, RBSA publishers (2010).
8. Patric Salomon, A hand book on Nano Chemistry, Dominant publishers and distributors (2008).
9. G. B. Sergeev, Nanochemistry ,Elsevier Science and Technology (2007).
10. U. Saityanarayana, Essentials of Biochemistry, Books and Allied (P) Ltd.,
11. T. Pradeep, Nano: The essentials., McGraw Hill Education.(2007)

Suggested References

11. W. E. Addison, Structural principle in inorganic chemistry, Longman (1961).
12. D. M. Adams, Inorganic solids, John Wiley Sons (1974).
13. Azaroff, Solid State Chemistry, John Wiley.
14. B. E. Douglas, D.H. McDaniel's and Alexander, Concepts and Models of Inorganic Chemistry, Oxford IBH, (1983)
15. M. C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974).
16. J.E. Huheey, Inorganic Chemistry - Principles, Structure and Reactivity, Harper Collins, New York, IV Edition (1993).
17. N. Greenwood and A. Earnshaw, Chemistry of Elements, Pergamon, NY, (1984).
18. F.A. Cotton and G. Wilkinson Advanced Inorganic Chemistry - A Comprehensive Text, John Wiley and Sons, V Edition (1988).
19. K.F. Purcell and J.C. Kotz, Inorganic Chemistry - WB Saunders Co., USA (1977)
20. W. U. Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, S. Chand and Co., New Delhi, (1992).
21. M.N. Hughes, The Inorganic Chemistry of Biological processes, Wiley London, II Edition (1982).
22. Jonathan W. Stead, David R. Turner and Karl. J. Wallace., Core concepts in Supramolecular Chemistry and Nanochemistry, John Wiley sons Ltd (2007).
23. Beoffry A.Ozin, Andre Arsenault, Ludovico & Cademartiri. Nano chemistry - A chemical approach to nano materials, Royal Society of chemistry (2009).
24. Kenneth J. Klabunde, Nano scale materials in Chemistry A. John Wiley & Sons Publishers (2001).
25. L. Stryer, Biochemistry, V Edition, Freeman & Co., New York (2002) .
26. D. L. Nelson and M. M. Cox, Lehninger, Principles of Biochemistry, III edition, McMillan North Publication (2002).
27. W. Kaim and B. Schwederski, Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, an Introduction and Guide, Wiley, New York (1995).
28. S. J. Lippard and J. M. Berg, Principles of Bioinorganic Chemistry, University Science Books (1994).
29. I. Bertini, H. B. Grey, S. J. Lippard and J. S. Valentine, Bioinorganic Chemistry, Viva Books Pvt. Ltd., New Delhi (1998).
30. R. Gopalan, Text book of Inorganic Chemistry, University press (India) private Ltd.

PAPER-6
PHYSICAL CHEMISTRY II

OBJECTIVES:

To understand the behavior of kinetic reactions and fast reaction. To understand the behavior of electrolytes in solution. To know the structure of the electrode surface. To differentiate electrode kinetics from other types of kinetic studies. To know the applications of electrode process. To study the concept and applications of group theory.

UNIT-I: KINETICS OF COMPLEX REACTIONS & FAST REACTIONS

Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions - chain length - Rice Herzfeld mechanism - explosion limits.

Study of fast reactions - relaxation methods - temperature and pressure jump methods - stopped flow and flash photolysis methods.

UNIT-II: ELECTROCHEMISTRY – I

Mean ionic activity and mean ionic activity coefficient - activity coefficient of strong electrolytes - determination of activity coefficient by electrochemical method.

Debye Huckel limiting law - qualitative and quantitative verification - limitation - Debye Huckel limiting law at appreciable concentrations of electrolytes - Debye - Huckel - Bronsted equation.

UNIT-III: ELECTROCHEMISTRY – II

Electrode - electrolyte interface - adsorption at electrified interface - electrical double layer - electro capillary phenomenon - Lippmann equation - Structure of double layers - Helmholtz - Perrin, Guoy - Chapman and Stern model of electrical double layers.

Diffusion - Fick's law of diffusion - Effect of ionic association on conductance-electro kinetic phenomena - membrane potential.

UNIT-IV: GROUP THEORY – I

Definition of basic terms in group theory – Group – Abelian group, cyclic group, subgroup, group multiplication table - similarity transformation and class, symmetry elements and symmetry operations - Point groups (any examples limited to $n = 4$ of C_{nv} , C_{nh} , D_{nh} , D_{nd} , & T , T_d , O , O_h), Reducible and Irreducible representations - direct product representation. Character Table - explanation of various column and Mulliken Symbol.

UNIT-V: GROUP THEORY – II

Orthogonality theorem and its consequences - construction of character table for C_{2v} , C_{3v} , C_{2h} , and D_{2d} point groups - hybrid orbitals in nonlinear molecules (CH_4 , BF_3 , and NH_3). Determination of representations of vibrational modes in nonlinear molecules (H_2O , NH_3 , BF_3 and $[PtCl_4]^{2-}$). Symmetry selection rules of Infra-red and Raman spectra.

TEXT BOOKS

1. J. Rajaram and J. C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
2. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).
3. K. L. Kapoor, A text book of Physical Chemistry, Mac Millan India Ltd., (2001).
4. S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
5. D. R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
6. K.V. Raman, Group Theory and its Applications to Chemistry, Tata Mc Graw Hill Publishing Co., (1990).
7. P. K. Bhattacharya, Group Theory and its Applications, Himalaya Publishers.
8. K.V. Ramakrishnan and M. S. Gopinath, Group Theory in Chemistry, Vishal Publications (1998).

SUGGESTED REFERENCES

1. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
2. C. Capellos and B. H.J. Bielski, Kinetic Systems, Wisely Interscience, New York (1972).
3. Amdur and G.G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
4. G. M. Harris, Chemical Kinetics, D. C. Heath and Co., (1966).
5. J. Robbins, Ions in Solution - An Introduction of Electrochemistry, Clarendon Press, Oxford (1972).

6. John O. M. Bockris, Amulya K.N. Reddy, Modern Electrochemistry 2B: Electrode Processes in Chemistry, Engineering, Biology and Environmental Science
7. F. A. Cotton, Chemical Applications of Group Theory, John Wiley and Sons inc., New York (1971).
8. N. Thinkham, Group Theory and Quantum Mechanics, McGraw Hill Book Company, New York (1964).
9. S. Schonland, Molecular Symmetry, Vannostrand, London (1965).
10. Alan Vincent, Molecular Symmetry and Group Theory-Programme Introduction to Chemical Application, Wiley, New York (1977).
11. S. Swarnalakshmi, T. Saroja and R. M. Ezhilarasi, A simple Approach to Group Theory in Chemistry, University press (India) private Ltd (2008).

**ELECTIVE
PAPER-2
(to choose 1 out of 3)**

A. GREEN CHEMISTRY

OBJECTIVES:

To know the principle and importance of green chemistry. To understand the student green chemistry strategies for designing the chemical synthesis. To know the solvent free synthesis. To make the students knowledgeable ultrasound and microwave assisted green synthesis.

UNIT- I: BASIC PRINCIPLES OF GREEN CHEMISTRY

Basic principles, prevention of waste/by-products, maximum incorporation of the reactants (starting materials and reagents) into the final product, prevention or minimization of hazardous products, designing safer chemicals, energy requirements for synthesis, selection of appropriate solvent, selection of starting materials, use of protecting groups, use of catalyst and products designed should be biodegradable.

UNIT- II: ULTRASOUND AND MICROWAVE ASSISTED GREEN SYNTHESIS

Ultrasound: Introduction, instrumentation, the phenomenon of cavitation. Sonochemical esterification, substitution, addition, alkylation, oxidation, reduction and coupling reactions.

Microwaves: Introduction, concept, reaction vessel/ medium, specific effects, atom efficiency (% atom utilization), advantages and limitations. N-alkylation and alkylation of active methylene compounds and Diels –Alder reactions. Reactions in water and reaction in organic solvents. Solvent free reactions and deprotection of esters.

UNIT- III: IONIC-LIQUIDS AS GREEN SOLVENTS

Introduction, structure, synthesis and applications of some important ionic liquids in organic synthesis.

Polymer supported reagents in green synthesis: Introduction - properties and advantages of polymer supported reagents and choice of polymers.

Substrate covalently bound to the support: Synthesis of oligosaccharides, intramolecular cyclisation. Selective chemical reactions on one aldehyde group of symmetrical aldehydes - Asymmetric synthesis.

Reagent linked to a polymeric material: Preparation of sulfonazide polymer and application in diazotransfer reaction. Synthesis of polymer bound per acid and its applications, synthesis of polystyrene tin dichloride resin and its applications.

Polymer supported catalytic reactions: Preparation of polymer supported AlCl_3 and applications - polymer supported photo sensitizers.

UNIT- IV: PHASE TRANSFER CATALYSIS IN GREEN SYNTHESIS

Introduction, mechanism of phase transfer catalyst reaction, types and advantages of phase transfer catalyst, types and applications of phase transfer reaction: Nitriles from alkyl or acyl halides, alkyl fluorides, alcohols, azides from alkyl halides, generation of dichlorocarbenes, addition to olefins, elimination reaction, alkylation reactions, Williamson synthesis, Benzoin condensation, Darzen reaction, Michael reaction, Wittig reaction, oxidation under PTC condition and reduction.

UNIT-V: INDUSTRIAL CASE STUDIES

Methyl Methacrylate (MMA)-Greening of Acetic acid manufacture, Vitamin-C- Leather manufacture-Types of Leather- Difference between Hide and Skin- Tanning –Reverse tanning-Vegetable tanning-Chrome tanning- Fat liquoring- Dyeing- Application- Polyethylene-Ziegler Natta Catalysis, Metallocene Catalysis- Eco friendly Pesticides-Insecticides.

Text Books:

1. New Trends in Green Chemistry, V. K. Ahluwalia, M. Kidwai, II Edn., Anamaya publishers New Delhi(2007).
2. Green Chemistry and Introductory text, Mike Lancaster, II Edition
3. Organic synthesis: Special techniques, V. K. Ahluwalia and R. Aggarwal, Narosa, New Delhi, 2003.

References:

4. Green Chemistry environment friendly alternatives, R. Sanghi and M M Srivastava, Narosa, New Delhi, 2003.
5. Green Chemistry – an introduction text, Royal Society of Chemistry, UK, 2002
6. P. T. Anastas and J. C. Warner, Green Chemistry theory and Practice, Oxford University press. Oxford (1988).
7. Phase Transfer Catalysis in Organic Synthesis, W. B. Weber, G. W. Gokel, Springer, Berlin, 1977.
8. Phase Transfer Catalysis, E. V. Dehmlov, S. S. Dehmlov, 2nd Edn., Verlagchemie, Wienhein, 1983.
9. Polymers as aids in Organic Synthesis, N. K. Mathur, C. K. Narang and R. E. Williams, Academic Press, NY, 1980.

PAPER-2

B. SUPRAMOLECULAR AND NANOCHEMISTRY

OBJECTIVES:

To know the student the basis of supramolecular chemistry, metal-organic framework solids, nano materials and their applications. To understand the various techniques available to characterize the advanced nano materials. To identify the applications of nanotechnology.

UNIT-I: SUPRAMOLECULAR CHEMISTRY

Definition of supramolecular chemistry. Nature of binding interactions in supramolecular structures: ion-ion, ion-dipole, dipole-dipole, H-bonding, cation-p, anion-p, p-p, and vander Waals interactions. Supramolecular synthons.

Self-assembly molecules: Design, synthesis and properties of the molecules, self-assembling by H-bonding, metal-ligand interactions and other weak interactions, metallomacrocycles, catenanes, rotaxanes, helicates and knots.

UNIT-II: FRAMEWORK SOLIDS

Introduction-definition of porosity, pore size, pore volume, pore density-zeolites-synthesis and applications-metal organic framework solids-definition-classifications-uses of different types of organic ligands- tuning of structure and properties - synthetic methods- advantage of MOF solids over zeolites- cracking of petroleum products

UNIT-III: SYNTHESIS OF SUPRAMOLECULES

Synthesis and structure of crown ethers, lariat ethers, podands, spherands, cyclophanes, cryptophanes, carcerands and hemicarcerands., Host-Guest interactions, lock and key analogy. Binding of cationic, anionic, ion pair and neutral guest molecules.

Molecular devices: molecular electronic devices, molecular wires, molecular rectifiers, molecular switches and molecular logic.

UNIT-IV: NANOCHEMISTRY

Introduction and definition of nanoparticles and nanomaterials, emergence of nanotechnology, challenges of nanotechnology. Synthesis of nanoparticles of ZnO₂, TiO₂, silver, gold, rhodium, palladium and platinum; carbon materials- fullerene- porous nano carbon (PNC).

Techniques of synthesis: Electroplating and electrophoretic deposition, conversion through chemical reactions and lithography; Thin films: Chemical vapor deposition and atomic layer deposition techniques; Carbon fullerenes and nanotubes.

UNIT-V: ANALYTICAL CHARACTERIZATION AND APPLICATIONS

X-rays, Infrared, UV-Vis, Laser Raman, Electron microscopic techniques (SEM and TEM) - Thermal analysis (TG/DTA/DSC) methods.

Application of nanotechnology: modern technology in electronic, biological, consumer and domestic applications. Energy related application: photo-voltaic cells, energy storage nanomaterial. Drug delivery, drug targeting. Sensors and biosensors.

Reference Books

1. C.N.R. Rao, A. Muller, A.K. Cheetam (Eds), The Chemistry of Nanomaterials, Vol.1, 2, Wiley – VCH, Weinheim, 2004
2. Nanochemistry, Kenneth J. Klabunde and G.B.Sergeev
3. G.Zhong Cao. Nanostructures and Nanomaterials: Synthesis, Properties and Applications, Imperial College Press (2004)
4. Metal-Organic Frameworks Applications from Catalysis to Gas Storage. Cejka, J, ed. (2011). Wiley-VCH. ISBN 978-3-527-32870-3
5. Zeolites and Catalysis: Synthesis, Reactions and Applications. Jiri Cejka; Avelino Corma; Stacey Zones (2010). John Wiley & Sons. ISBN 978-3-527-63030-1.
6. J.-M. Lehn; Supramolecular Chemistry-Concepts and Perspectives (Wiley-VCH, 1995)
7. P. D. Beer, P. A. Gale, D. K. Smith; Supramolecular Chemistry (Oxford University Press, 1999)

8. J. W. Steed and J. L. Atwood; Supramolecular Chemistry (Wiley, 2000).
9. C. P. Poole Jr, F. J. Owens, Introduction to nanotechnology, 2nd edition, Wiley-India, Delhi, 2008.
10. C. C. Kouch, Nanostructures materials: Processing, properties and applications, William Andrew publications, Newyork, 2002.
11. T. Pradeep, Nano: The essentials., McGrew Hill Education.(2007)

PAPER-2

C. MODERN SEPARATION TECHNIQUES

OBJECTIVES:

To learn the basic concept of chromatography. To understand the different chromatographic techniques. To study the applications of chromatography. To know the separation and purification methods.

UNIT-I: BASIC CONCEPTS OF CHROMATOGRAPHY

General description: Definitions, terms and parameters used in chromatography. Classification of chromatographic methods. Elution chromatography on columns. Migration rates of solutes, zone broadening, column efficiency and optimization of column performance.

UNIT-II GAS CHROMATOGRAPHY(GC)

Principles of gas-liquid chromatography, instrumentation, carrier gas, sample injection, column configuration and detection system (FID, TCD, ECD). Gas chromatographic columns (open tubular columns and packed columns) and stationary phases. Interfacing GC/MS.

UNIT-III: HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Column efficiency. Instrumentation: pumping system, sample injection system. Liquid chromatographic columns - types of column packing. Detectors: Absorbance detector and electrochemical detectors. Partition chromatography.

UNIT-IV: ION-EXCHANGE CHROMATOGRAPHY (IEC)

Definition, requirements for ion exchange resin. Synthesis and types of ion-exchange resins. Principle and basic features of ion - exchange reactions. Exclusion chromatography: Theory and principle of size exclusion chromatography. Experimental techniques of gel-filtration chromatography (GFC) and gel-permeation chromatography (GPC). Materials for packing-factors governing column efficiency. Methodology and applications.

UNIT-V: PURIFICATION AND EXTRACTION TECHNIQUES

Principle and techniques: Desiccants, precipitation: types of precipitation, factors affecting the precipitation. Distillation: fractional, steam, azeotropic, vacuum distillations. Recrystallization and sublimation.

Solvent extraction: Principle and techniques. Factors affecting the extraction efficiency: Ion association complexes, chelation, synergistic extraction and pH. Role of chelating ligands in solvent extraction. Introduction to solid phase extraction (SPE) and microwave assisted extraction (MAE) and applications.

REFERENCES

1. Fundamental of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch, 8th Edition, 2005, Saunders College Publishing, New York.
2. Analytical Chemistry, G.D. Christian, 5th ed., 2001 John Wiley & Sons, Inc, India.
3. Quantitative Analysis, R.A. Day and A.L. Underwood, 6th edition, 1993, prentice Hall, Inc. New Delhi.
4. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, 6th edition, Third Indian Reprint. 2003 Pearson Education Pvt. Ltd., New Delhi.
5. Analytical Chemistry Principles, John H. Kennedy, 2nd edition, Saunders College Publishing, California, 1990.
6. Introduction to Chromatography Theory and practice, V.K.Srivastava, K.K.Srivastava, Chand & Company Ltd, New Delhi
7. Principles of Instrumental Analysis, , D.A. Skoog,, F. James Holler, Timothy.A. Nieman, Harcourt Asia (P) Ltd
8. Principles of Instrumental Analysis, D.A. Skoog, , Saunders College Pub. Co, III Edn., 1985
9. Text Book of Quantitative Organic Analysis A.I Vogel, , ELBS III Edn, 1987.
10. Fundamentals of Analytical Chemistry, D.A. Skoog and D. M. West, Holt Rinehart and Winston Publications, IV Edn, 2004.
11. Instrumental Methods of Analysis, Willard, Merit, Dean and Settle, , CBS Publishers and Distributors, IV Edn., 1989
12. G. D. Christian and J. E. O. Reilly, Instrumental Analysis, Allyn and Bacon Inc, II Edn., 1988.
13. R. M. Upadhyay , Instrumental & Analytical Chemistry Principles & Procedure Kalyani Publishers(2002).

MAIN
PRACTICAL PAPER – 1
ORGANIC CHEMISTRY PRACTICAL- I

- A) Identification of components in a two component mixture and preparation of their derivatives. Determination of b.p. / m.p. for components and m.p. for the derivatives.
- B) Any Six preparations from the following:
1. Preparation of o-benzoyl benzoic acid (Fridel Crafts Reaction)
 2. p-Nitrobenzoic acid from p-nitrotoluene (Oxidation)
 3. Anthroquinone from anthracene (Oxidation)
 4. Glucose pentaacetate from Glucose (Acetylation)
 5. m-Nitroaniline from m-dinitrobenzene (Reduction)
 6. Benzophenone oxime from benzophenone (Addition reaction)
 7. p-Chlorotoluene from p-toluidine (Sandmeyers' Reaction)
 8. 2,3 - Dimethylindole from phenyl hydrazine and 2 - butanone (Fisher Indole Synthesis)
 9. 1,2,3,4 - Tetrahydrocarbazole from cyclohexanone (Fisher Indole Synthesis)
 10. Methyl orange from sulphanilic acid (Diazo Reaction)

| University Examination | Marks |
|------------------------------|-----------|
| Qualitative organic Analysis | 40 |
| Preparation | 20 |
| Viva voce | 10 |
| Record | 05 |
| Total | 75 |

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

References:

1. Arthur I. Vogel, "A Textbook of Practical Organic Chemistry", ELBS.
2. N.S. Gnanapragasam and B. Ramamoorthy, "Organic Chemistry Lab Manual" (2006), S. Visvanathan Printers & Publishers.

PRACTICAL PAPER – 2
INORGANIC CHEMISTRY PRACTICAL – I

A) Semimicro qualitative analysis of mixture containing two common and two rare cations. The following are the rare cations to be included. W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo and Be.

B) Complexometric Titrations (EDTA): Estimation of Ca, Mg and Zn.

C) Preparation of the followings:

1. Potassium tris (oxalate) aluminate (III) trihydrate
2. Tris (thiourea) copper (I) chloride
3. Potassium tris (oxalato) chromate (III) trihydrate
4. Sodium bis(thiosulphato) cuprate (I)
5. Tris (thiourea) copper (I) sulphate
6. Sodium hexanitrocobaltate (III)
7. Chloropentammine cobalt (III) chloride
8. Bis (acetylacetonato) copper (II)
9. Hexamminenickel (II) chloride
10. Bis (thiocyanato) pyridine manganese (II)

D). Separation of zinc and magnesium on an anion exchange.

Marks distribution:

| University Examination | Marks |
|--------------------------------|-----------|
| Qualitative Inorganic Analysis | 25 |
| EDTA Complexometric Titration | 20 |
| Preparation | 15 |
| Viva Voce | 10 |
| Record | 05 |
| Total | 75 |

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CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

PRACTICAL PAPER-3
PHYSICAL CHEMISTRY PRACTICAL- I

Experiments in Thermodynamics, colligative properties, phase rule, chemical equilibrium and chemical kinetics.

Typical examples are given and a list of experiments is also provided from which suitable experiments can be selected as convenient.

1. Heat of solution from Solubility measurements
2. Determination of Molecular weight
3. Determination of activity and activity coefficient
4. Construction of Phase diagram involving two / three component systems
5. Determination of partial molar quantities
6. Verification of Freundlich Adsorption isotherm
7. Reaction rate and evaluation of other kinetic parameters using polarimetry
8. Determination of Reaction rate and Rate constant using Analytical techniques: Conductometry and Dilatometry
9. Verification of Beer Lambert law.

Detailed list of Experiments for Physical Chemistry Practical I

Typical list of possible experiments is given.

Experiments of similar nature and other experiments may also be given.

Any 15 experiments have to be performed in a year.

1. Determine the temperature coefficient and energy activation of hydrolysis of ethyl acetate.
2. Study the kinetics of the reaction between acetone and iodine in acidic medium by half-life method and determine the order with respect to iodine and acetone.
3. Study the effect of solvent (DSMO-water, acetone-water system) on the rate of acid catalysed hydrolysis of acetal by dilatometry.
4. Study the Saponification of ethyl acetate by sodium hydroxide conductometrically and determine the order of the reaction.
5. Determine the order with respect to Silver (I) in the oxidation and rate constant and for uncatalysed reaction.
6. Study the inversion of cane sugar in the presence of acid using Polarimeter.
7. Determine the rate constant and order of the reaction between potassium persulphate and potassium iodide and determine the temperature coefficient and energy of activation of the reaction.
8. Study the effect of ionic strength on the rate constant for the saponification of an ester.
9. Study the salt effect on the reaction between acetone and iodine.

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10. Study the kinetics of the decomposition of sodium thiosulphate by mineral acid (0.5M HCl).
11. Study the primary salt effect on the kinetics of ionic reactions and test the Bronsted relationship (iodide ion is oxidized by persulphate ion).
12. Study the kinetics of enzyme catalysed reactions (Activity of tyrosinase upon tyrosine spectrophotometrically).
13. Study the salt effect, the solvent effect on the rate law of alkaline hydrolysis of crystal violet.
14. Study the reduction of aqueous solution of ferric chloride by stannous chloride.
15. Determine the molecular weight of benzoic acid in benzene and find the degree of association.
16. Determine the activity coefficient of an electrolyte by freezing point depression method.
17. Study the phase diagram form-toluidine and glycerine system.
18. Construct the phase diagram for a simple binary system naphthalene - phenanthrene and benzophenone-diphenyl amine.
19. Construct the boiling point composition diagram for a mixture having maximum boiling point and minimum boiling point.
20. Study the complex formation between copper sulphate and ammonia solution by partition method.
21. Study the simultaneous equilibria in benzoic acid - benzene - water system.
22. Determine the degree of hydrolysis and hydrolysis constant of aniline hydrochloride by partition method.
23. Determine the molecular weight of a polymer by viscosity method.
24. Determine the viscosities of mixtures of different compositions of liquids and find the composition of a given mixture.
25. Determine the partial molal volume of glycine / methanol and formic acid / sulphuric acid by graphical method and by determining the densities of the solutions of different compositions.
26. Study the temperature dependence of the solubility of a compound in two solvents having similar inter molecular interactions (benzoic acid in water and in DMSO water mixture) and calculate the partial molar heat of solution
27. Construct the phase diagram of the three component of partially immiscible liquid system (DMSO-water benzene; acetone-chloroform -water; chloroform-acetic acid-water)
28. Construct the phase diagram of a ternary aqueous system of glucose -potassium chloride and water
29. Study the surface tension - concentration relationship for solutions (Gibb's equation)

30. Study the absorption of acetic acid by charcoal (Freundlich isotherm).
31. Study the complex formation and find the formula of silver-ammonia complex by distribution method.
32. Determine the dissociation constant of picric acid using distribution law

Marks distribution:

| University examination | Marks |
|-------------------------------|--------------|
| Procedure | 10 |
| Manipulation | 25 |
| Result | 25 |
| Viva voce | 10 |
| Record | 05 |
| Total | 75 |

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK): MAX.
MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

**SECOND YEAR
SEMESTER III**

**PAPER - 7
ORGANIC CHEMISTRY III**

OBJECTIVE:

To understand the concepts of spectral techniques and to apply these techniques for the quantitative and structural analysis of organic compounds. To learn the chemistry of terpenes, alkaloids and free radicals and their importance.

UNIT-I: UV AND IR SPECTROSCOPY AND THEIR APPLICATIONS

Ultraviolet-Visible spectroscopy: Types of electronic transitions - chromophores and auxochromes - factors influencing the positions and intensity of absorption bands - absorption spectra of dienes, polyenes and unsaturated carbonyl compounds - Woodward - Fieser rules and its applications.

Infra Red Spectroscopy: Vibrational frequencies and factors affecting them - identification of functional groups - intra and inter molecular hydrogen bonding - functional group region- finger print region - far IR region.

UNIT-II: NMR SPECTRA AND ITS APPLICATIONS

Nuclear spin - magnetic moment of a nucleus - nuclear energy levels in the presence of magnetic field - basic principles of NMR experiments - CW and FT NMR - ^1H NMR - Chemical shift and coupling constant - factors influencing proton chemical shift and vicinal proton - proton coupling constant- ^1H NMR spectra of simple organic molecules such as $\text{CH}_3\text{CH}_2\text{Cl}$ and CH_3CHO .

AX and AB spin system - nuclear overhauser effect- chemical exchange.

^{13}C NMR - proton decoupling and Off resonance decoupling spectra - factors affecting ^{13}C NMR chemical shift - ^{13}C NMR spectra of simple organic molecules.

UNIT-III: PHYSICAL METHODS OF STRUCTURAL DETERMINATION

Mass spectroscopy - Principles - measurement techniques - (EI, CI, FD, FAB, SIMS) - presentation of spectral data - molecular ions - isotope ions - fragment ions of odd and even electron types - rearrangement ions - factors affecting cleavage patterns - simple and multicentre fragmentation - Mc Lafferty rearrangement - Mass spectra of hydrocarbons, alcohols, phenols, aldehydes and ketones. ORD and its applications - Octant rule - cotton effect - axial halo ketone rule - Problem solving (for molecules with a maximum number of C10).

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UNIT-IV: TERPENES AND ALKALOIDS

Introduction - classification - isoprene rule - structural determination of terpenoids' - Citral, geraniol - linalool - farnesol - α -pinene and camphor.

Introduction - isolation of alkaloids - total synthesis of quinine - morphine and reserpine.

UNIT-V: FREE RADICALS

Long and short-lived free radicals - methods of generation of free radicals - detection of free radicals by ESR - Addition of free radicals to olefinic double bonds - aromatic radical substitutions reactions - decomposition of diazo compounds – phenol coupling - Sandmeyer reaction - Gomberg reaction - Pschorr reaction - Ulmann reaction and Hunsdiecker reaction.

RECOMMENDED BOOKS

1. Francis A. Carey and Richard J. Sundberg, Advanced organic chemistry, III Edition (1990). G.A Swan, Introduction to alkaloids
2. I.L. Finar, Organic chemistry, Vol. II, 5th edition ELBS publication.
3. J. Dyer, Application of absorption spectroscopy of organic compounds, Prentice and Hall of India, Pvt., New Delhi.
4. J. March, Advanced organic reaction mechanism and structure, Tata McGraw Hill.
James verghese, Terpene Chemistry.
5. Neil S. Issac, Physical organic chemistry, ELBS publication 1987.
6. O.P. Agarwal, Chemistry of organic Natural Products, Goel Publishing House, Meerut.
7. P.S. Kalsi, Spectroscopy of organic compounds, Wiley Eastern Ltd., Chennai.
8. R.M. Silverstein, G.d. Bassler and Monsu, Spectrometric identification of organic compounds, John Wiley and Sons, New York.
9. S.M. Mukherji and S.P. Singh, Organic Reaction Mechanism, MacMillan India Ltd., Chennai (1990).
10. Schliemann, Introduction to the spectroscopic methods for the identification organic compounds, 2 volumes, Pergamon Press.
11. W. Kemp, Spectroscopy, Macmillan Ltd.,
12. Y.R. Sharma, Structural identification of organic compounds, S. Chand & Co.

PAPER- 8
INORGANIC CHEMISTRY III

OBJECTIVE:

To study about the Coordination complexes, Substitution in Coordination complexes and Inorganic Photochemistry.

UNIT-I: ORGANO METALLIC CHEMISTRY - I

Carbon donors: Alkyls and aryls metallation, bonding in carbonyls and nitrosyls, chain and cyclic donors, olefins, acetylene and allyl system. Synthesis, structure and bonding of metallocenes (ferrocene only).

Reactions: Association, substitution, addition and elimination reactions, ligand protonation, electrophilic and nucleophilic attack on ligands. Carbonylation, decarboxylation, oxidative addition and fluxionality.

UNIT-II: ORGANO METALLIC CHEMISTRY - II

Catalysis: Hydrogenation of olefins (Wilkinson's catalyst), hydroformylation of olefins using cobalt or rhodium catalysts (Oxo process), oxidation of olefins to aldehydes and ketones (Wacker process), polymerization (Ziegler - Natta Catalyst); cyclo oligomerisation of acetylene using nickel catalyst (Reppe's catalyst); polymer-bound catalysts.

UNIT-III: COORDINATION CHEMISTRY - IV

Electron transfer reactions, outer and inner sphere processes; atom transfer reaction, formation and rearrangement of precursor complexes, the bridging ligand, precursor and successor complexes. Marcus theory. Complementary, non-complementary and two electron transfer reactions.

UNIT-IV: COORDINATION CHEMISTRY - V

Substitution Reactions: Substitution in square planar complexes, reactivity of platinum complexes, influences of entering, leaving and other groups, the Trans effect.

UNIT-V: COORDINATION CHEMISTRY - VI

Substitution of octahedral complexes of cobalt and chromium, replacement of coordinated water, solvolytic (acids and bases) reaction applications in synthesis (platinum and cobalt complexes only).

Inorganic Photochemistry: Photo-substitution, Photoredox and isomerisation process, application of metal complexes in solar energy conversion.

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Text books

1. R.C. Mehrotra, A. Singh, Organo Metallic Chemistry, Wiley Eastern Co., (1992).
2. F. Basolo and R.G. Pearson, Mechanism of Inorganic Reaction, Wiley NY (1967).
3. J. Huheey, Inorganic Chemistry, Harper and Collins, NY IV Edition, (1993).
4. K.F. Purcell and J.C. Kotz, Inorganic Chemistry, W. Saunders Co., (1977).
5. S. FA Kettle, Coordination Chemistry, ELBS, (1973).
6. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, John Wiley and Sons, V Edition (1988).
7. D.F. Shrivvers, Pw. Atkins and C.H. Langford, Inorganic Chemistry, OUP (1990).
8. Guillermo J. Ferraudi, Elements of inorganic photochemistry, Wiley (1988).
9. Arthur W. Adamson, Paul D. Fleischauer, Concepts of inorganic photochemistry, Wiley(1975).

Suggested References

1. G. Coates M.I. Green and K. Wade. Principles of Organometallic chemistry, Methven Co., London (1988).
2. P. Powell, Principles of Organometallic chemistry, Chappman and Hall. (1998).
3. G.S. Manku, Theoretical Principles of Inorganic Chemistry, McGraw-Hill Education, (1984).
4. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974).
5. R.B. Heslop and K. Jones, Inorganic Chemistry, Elsevier Scientific Publ., (1976).
6. F. Basolo and R.G. Pearson, Mechanism of Inorganic Reaction, Wiley NY (1967).
7. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974).
8. B.E. Dogulas DH McDaniel's and Alexander, Concepts and Models of Inorganic Chemistry, Oxford IBH (1983).
9. WU. Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, S. Chand and Co., New Delhi (1992).

PAPER-9
PHYSICAL CHEMISTRY III

OBJECTIVES:

To study the electrochemical kinetics, over potential, corrosions and fuel cells. To know the solid state and its properties. To Study the principles and applications of spectroscopy. To study statistical thermodynamics,

UNIT-1: ELECTROCHEMISTRY- III

Mechanism of electrode reactions - polarization and over potential - the Butler-Volmer equation for one step and multistep electron transfer reactions - significance of electron exchange current density and symmetry factors - transfer coefficient and its significance - mechanism of the hydrogen and oxygen evolution reactions.

Corrosion and passivation of metals - Pourbaix diagram - Evan's diagram - fuel cells - electrodeposition - principle and applications.

UNIT-II: SOLID STATE

Classification of solids - Imperfection in solids - point, line and plane defect - Electrons and holes - Non-stoichiometry - Imperfection and physical properties of solids (brief study). **Electrical properties** - electrical conductivity - Hall effect - dielectric properties - piezo electricity, Ferro electricity and conductivity; **Optical properties** - Photo conductivity -luminescence - color center - lasers - refraction - birefringence;

Magnetic properties - diamagnetism - paramagnetism - ferro - antiferro and ferrimagnetisms. Calculation of magnetic moments. Mechanical and thermal properties.

UNIT-III: SPECTROSCOPY - I

Microwave spectroscopy – Rotational spectroscopy of rigid rotator - non rigid rotator - diatomic and polyatomic molecules.

Vibrational spectroscopy - Harmonic oscillator - anharmonicity - vibrational spectra of polyatomic molecules - vibrational frequencies - group frequencies - vibrational coupling- overtones - Fermi resonance.

Raman Spectroscopy- Raman effect, Stoke's and Anti-stoke's lines, rotational and vibrational Raman spectra.

Electronic spectroscopy - Progressions and sequences, selection rules, Franck - Condon principle, types of electronic transitions - solvent effects.

UNIT-IV: SPECTROSCOPY- II

Resonance spectroscopy - Zeeman effect - equation of motion of spin in magnetic fields - chemical shift - spin-spin coupling - NMR of simple AX and AMX type molecules - calculation of coupling constants - ^{13}C , ^{19}F , ^{31}P NMR spectra - applications - a brief discussion of Fourier Transformation Resonance Spectroscopy.

UNIT-V: STATISTICAL THERMODYNAMICS- I

Objectives of statistical thermodynamics - concept of thermodynamic and mathematical probabilities - permutations and combinations, distribution of distinguishable and non-distinguishable particles. Stirling approximation, Maxwell - Boltzmann distribution law - Fermi - Dirac and Bose - Einstein statistics - comparison with Maxwell -Boltzmann distribution law and their applications - radiation law - electron gas in metals. Partition function - evolution of translational, vibrational and rotational partition functions for mono and diatomic ideal gases.

Text Books

- S.Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
- D.R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
- S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
- P.H.Rieger, Electrochemistry, Chapman and Hall, New York (1994).
- R.Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
- Lesley E.Smart, Elaine A.Moore, Solid State Chemistry - An Introduction
- Charles Kittel - Introduction to Solid State Physics
- Anthony R. West - Solid State Chemistry and its Applications
- C.N. Banwell and E.M. McCash, Fundamentals of Molecular spectroscopy, IV - Edition, Tata McGraw Hill (2005).
- N. Sathyanarayana, Vibrational Spectroscopy, New Age International Publishers (2004).
- Carington and Ad. Mclachlan, Introduction to Magnetic Resonance, Harper and Row, New York (1967).
- M. C.Gupta, Statistical thermodynamics, Wiley Easter, New Delhi (1990).
- R.Hasee, Thermodynamics Of Irreversible Process, Addition Wesley, Reading, Mass (1969).

Suggested References

- J.O.M. Bokris and A. K. N. Reddy, *Electrochemistry*, Vol. 1 and 2, Plenum, New York (1977).
- P. Dalahay, *Electrode Kinetics and Structure of Double Layer*, Inter Science, New York (1965).
- J.Robbins, *Ions in Solution-An Introduction to Electrochemistry*, Clarendon Press, Oxford (1993).
- H.Reiger, *Electrochemistry*, Chapman and Hall, New York (1994).
- W.J. Moore, *Physical Chemistry*, Orient Longman, London (1972).
- J.M. Murrell, S.F.A. Kettle and J.M. Tedder, *The Chemical Bond*, Wiley (1985).
- R.C. Ropp, *Solid State Chemistry*
- C N. Banwell, *Fundamentals of Molecular Spectroscopy*, Mc Graw Hill (1966).
- Raymond Chang, *Basic Principles of Spectroscopy*, McGraw Hill Ltd., New York (1971).
- G M. Barrow, *Introduction to Molecular Spectroscopy*, Mc Graw Hill, New York (1962).
- W. Kemp, *NMR in Chemistry*, Mc Millan Ltd., (1986).
- D. Mclauchlan, *Magnetic Resonance*, Oxford Chemistry Series, Oxford (1970).
- P. Staughan and S. Walker, *Spectroscopy*, Vol. I, II & III, Chapman and Hall (1976).
- J.K. Sanders and B.K. Hunter, *Modern NMR Spectroscopy, A Guide for Chemists*, Oxford University Press, Oxford (1987).
- Jk.M. Sanders, E.C. Constable and B.K. Hunter, *Modern NMR Spectroscopy - a Work Book of Chemical Problems*, Oxford (1989).
- Francis W Sears and Gerhard L Salinger, *Thermodynamics, kinetic theory, and statistical thermodynamics*.
- P. Dalahay, *Electrode Kinetics and Structure of Double Layer*, Inter Science, New York (1965).

**ELECTIVE
PAPER-3
(to choose 1 out of 3)**

A. Scientific Research Methodology

OBJECTIVES:

To study about the importance of research, literature survey, error analysis, statistical treatment. To study about the conventions of writing thesis.

UNIT-I: INTRODUCTION

Nature and importance of research - aims, objective, principles and problems - selection of research problem - survey of scientific literature - primary and secondary sources - citation index for scientific papers and journals - patents.

UNIT-II: CONDUCT OF RESEARCH WORK

Physical properties useful in analysis and methods of separation prior to analysis - Isolation techniques - extraction - Soxhlet extraction, crystallization, sublimation - methods for vacuum sublimation and distillation under reduced pressure.
Chemistry of working with hazardous materials - acid / base / water sensitive, corrosive, toxic, explosive and radioactive materials.

UNIT-III: EVALUATION OF ANALYTICAL DATA

Precision and accuracy - Reliability - determinate and random errors - distribution of random errors - normal distribution curve.

UNIT-IV: STATISTICAL TREATMENT OF ANALYTICAL DATA

Statistical treatment of finite samples - the students test and F test - criteria for rejection of an observation - the Q test, significant figures and computation rules - data plotting - least square analysis.

UNIT-V: THESIS AND ASSIGNMENT WRITING

Conventions of writing - the general format - page and chapter format - use of quotations and footnotes - preparation of tables and figures - referencing - appendices - revising editing and evaluating the final product - proof reading - meanings and examples of commonly used abbreviations.

REFERENCES

1. Douglas A. Skoog and Donald, M. West, Fundamental of analytical chemistry, Halt Saundersons International Edition.
2. J. Anderson, H.M. Durston and M.Poole, Thesis and assignment writing - Wiley Eastern Ltd., (1970).
3. J. March, Advanced organic chemistry - reactions, Mechanism & Structure. McGraw Hill Student Edition.
4. Vogel's Textbook of quantitative chemical analysis, ELBS edition.
5. Rajammal P. Devados, Research Methodolgy.

PAPER-3

B. ADVANCED BIOINORGANIC CHEMISTRY

OBJECTIVES:

1. *To learn the importance of Bioinorganic Chemistry*
2. *To learn the role of metal ions in the biologically important complexes*
3. *To learn mechanism of photosynthesis*

UNIT - I: SCOPE OF BIOINORGANIC CHEMISTRY

Introduction: Trace elements, complex formation, hard and soft acids and bases (HSAB), inert and labile complexes. Amino acids and proteins - structure of proteins, peptide bond - enzymes - nucleic acid - carbohydrates - blood - plasma.

Concepts of essentiality - evolution of essential trace elements - future essential trace elements- role of minerals - working of essential trace elements - essential ultra trace elements - essential ultra trace nonmetals.

UNIT - II: METALLOPORPHYRINS

Respiratory proteins: Hemoglobin and Myoglobin - structure and functions - oxygenation reactions - structure and functions relationship - structural models for dioxygen binding - synthetic models for oxygen binding - models for Hemoproteins – Hemerythrin - Hemocyanin. Non-redox metalloenzymes: Peroxidase, Catalase and Alcohol Dehydrogenase (Structure, mechanism of action and model compound)

UNIT - III: METALLOENZYMES

Copper enzymes: Superoxide dismutase, cytochrome oxidase and ceruloplasmin - Molybdenum enzymes: Pyridoxal oxidase and xanthine oxidase. Zinc enzymes: Carbonic anhydrase and carboxy peptidase. Cobalt enzyme: Vitamin B₁₂. Biom mineralization – Siderophores - Ferritin and Transferrin,

UNIT - IV: METALS IN MEDICINE

Metal deficiency and disease - toxicity of mercury, cadmium, lead, beryllium, selenium and arsenic - biological defence mechanism - meaning and example of chelation therapy - Metals used for diagnosis (Tc, Fe and Co) - Metals in medicine: platinum complexes as anticancer drugs, Pt-DNA binding, complexes of gold, copper, zinc, mercury, arsenic and antimony as drugs.

UNIT - V: NITROGEN FIXATION AND PHOTOSYNTHESIS

Nitrogenase enzyme: Reactivity, reduction involving nitride / diazene intermediate, dinitrogen complexes and their reactivity in vitro nitrogen fixation. Photosynthesis: Structure of chlorophyll in green plants (Z- Scheme) - ATP synthesis - Role of manganese complex in oxygen evolution - dark reaction (Calvin cycle).

TEXT BOOKS

1. K. Hussain Reddy, Bioinorganic Chemistry, New Age international publishers (2007)
2. S. J. Lippard & J. M. Berg. Principles of Bioorganic Chemistry, Panima Publ. Corpn. (2005).
3. E. I. Ochiai. Bioinorganic Chemistry – An Introduction, Allyn and Bacon Inc. (1977).
4. M.N. Hughes, Inorganic Chemistry of Biological Processes, John Wiley & Sons, 2nd Edition, 1985
5. R.P. Hanzlik. Inorganic Aspects of Biological and Organic Chemistry, Academic Press (1976)

REFERENCE BOOKS

1. H. Kraatz & N. Metzler-Nolte (Eds.). Concepts and Models in Bioinorganic Chemistry, Wiley (2006).
2. I. Bertini, H. B. Gray, S. J. Lippard & J. S. Valentine, Bioinorganic Chemistry, Viva Books Pvt. Ltd. (2004).
3. A.W. Addison, W.R. Cullen, D. Dolphin & B.R. James (eds.). Biological Aspects of Inorganic Chemistry, John Wiley (1977).
4. R.J.P. Williams & J.R.R.F. Dasilva. New Trends in Bioinorganic Chemistry, Academic Press (1978).
5. A. E. Martell. Inorganic Chemistry in Biology and Medicine, ACS Symp. Series, ACS (1980).
6. S. J. Lippard. Progress in Inorganic Chemistry: Bioinorganic Chemistry, Vol. 38, John Wiley (1990).
7. N. Kaim & B. Schwederski. Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, John Wiley (1994).
8. Advanced Inorganic Chemistry, F.A. Cotton and G. W. Wilkinson. John Wiley & Sons, 5th Ed. 1988.
9. Inorganic Chemistry, Principles of Structure and Reactivity, J. E. Huheey, E.A. Keiter 4th Ed. Harper Collins, 1993.
10. Bioinorganic chemistry, R. W. Hay, Halsted Press, 1984.
11. Principles of Bioinorganic Chemistry, S. J. Lippard and J.M. Berg, Panima Publishing Corporation, 2nd Ed., 1995.

PAPER-3
C. ADVANCED ANALYTICAL TECHNIQUES

OBJECTIVES:

On the completion the course the students will have the knowledge of various instrumental techniques. The students should have learnt data analysis and electroanalytical techniques.

UNIT-1: ELECTROANALYTICAL TECHNIQUES:

Voltametry - coulometry - amperometry – potentiometry – polarography - electrolytic conductivity - impedance spectroscopy.

UNIT-II: CHEMICAL ANALYSIS:

Non-destructive techniques: Wavelength and energy dispersive X-ray fluorescence spectroscopy (WDS and EDS) - X-ray absorption spectroscopy (XANES and EXAFS) - secondary ion mass spectrometry (SIMS) - temperature programmed desorption (TPD) - thermal desorption spectroscopy (TDS).

Destructive techniques: Atomic absorption spectroscopy (AAS) - inductively coupled plasma-atomic emission spectroscopy (ICP-AES).

UNIT-III: IMAGING AND DEPTH PROFILING:

Basic concepts in surface imaging - secondary electron microscopy (SEM) - secondary Auger microscopy (SAM) - scanning probe microscopy (SPM) - scanning tunneling microscopy (STM) - transmission electron microscopy (TEM) - surface imaging - depth profiling. Associated techniques of microscopy and spectroscopy.

UNIT- IV: THERMAL ANALYSIS:

Thermo gravimetric and differential thermal analysis - thermometric titrations - differential scanning calorimetry - basic instrumentation and applications.

UNIT-V: RADIOCHEMICAL METHODS

Hot atom chemistry – the Szilard – chalmers process, chemistry of recoil atoms, chemical effects on radioactive decay, solvated electron. Uses of radiations in the study of matter, neutron activation analysis, dilution analysis, dosimetry, synthesis of organic and inorganic compounds by irradiation. Radiometric analysis and radiography.

TEXT BOOKS:

1. R. Wiesendanger, *Scanning Probe Microscopy and Spectroscopy*, Cambridge University Press, 1994.
2. Frank A. Settle, *Handbook of instrumental techniques for analytical chemistry*, Prince Hall, New Jersey, 1997.
3. K. W. Kolasinski, *Surface science: Foundations of catalysis and nanoscience*, John Wiley and Sons, West Susses, 2002.
4. D. A. Skoog, D. M. West, F. J. Holler and S. R. Couch, *Fundamentals of analytical chemistry*. Brooks/ColeCengage learning, New Delhi, 2004.
5. P. Atkins and J. de Paula, *Atkins' physical chemistry*, 8th Ed., Oxford University Press, New Delhi, 2008.
6. T. Pradeep, *Nano: The essentials*, McGraw-Hill Education, New Delhi, 2010.
7. F. Scholz, *Electroanalytical Methods*, Springer, 2nd Ed., 2010.
8. Allen J. Bard and Larry R. Faulkner, *Electrochemical Methods: Fundamentals and Applications*, 2nd edition 2001, John Wiley & Sons
9. Allen J. Bard (Ed), *Electroanalytical Chemistry*, Vol.13, Plenum Press 1983
10. Joseph Wang, *Analytical Electrochemistry*, 3rd edition 2006, John Wiley & Sons
11. D.A .Skoog, 1985, *Principles of Instrumental Methods of analysis*, III Edition, Saunders College Publ.
12. Willard Merrit, Dean and Settle, 1986, *Instrumental methods of analysis*, VI Edition, CBS Publ.
13. D.A. Skoog and D.M. West, 1982, *Fundamentals of Analytical Chemistry*, IV Edition, old Reinhord & Winston, Publication

SUGGESTED REFERENCE BOOKS:

1. G.D.Christian & J.E.O. Reily, 1986, *Instrumental Analysis*, II Edition, Allegn Recon.
2. H.A. Strobel, 1976, *Chemical Instrumentation*, Addition- Wesely Publ Co.
3. Kolthoff and Elwing (All Series) - *Treatise on Analytical Chemistry*.
4. Willson Series - *Comprehensive Analytical Chemistry*.
5. Willard, Merit, Dean and Settle, *Instrumental Methods of Analysis*, CBS Publishers and Distributors, IV Edn. 1986
6. Schoog, Holler, Nieman, *Principles of Instrumental Analysis*, Thomson Asia Pte Ltd., Singapore, 2004.

SEMESTER IV

PAPER - 10
ORGANIC CHEMISTRY IV

OBJECTIVE:

To understand the concepts of Aromaticity, Photochemical Reactions, Antibiotics and proteins. Applications and Techniques of Dyeing.

UNIT-I: AROMATICITY

Aromaticity of benzenoid - non-benzenoid and heterocyclic compounds - Huckel's rule - Aromatic systems with π electron numbers other than six - non-aromatic (cyclo octatetraene etc,) and anti aromatic system (cyclobutadiene etc.) - system with more than 10π electrons - Annulenes upto C18 (synthesis of all these compounds is not expected).

UNIT-II: PHOTOCHEMISTRY

Photochemical excitation - fate of the excited molecules - Jablonski diagram - study of photochemical reactions of ketone - photo reduction - photo cycloaddition - Paterno - Buchi reaction - di pi-methane rearrangement - Pericyclic analysis of electrocyclic - cyclo addition and sigmatropic reactions - correlation diagrams for butadiene - cyclobutene system - hexatriene to cyclohexadiene systems - structure of bulvalene - fluxional molecule - Cope and Claisen rearrangement.

UNIT-III PROTEINS AND NUCLEIC ACIDS

Proteins - peptides and their synthesis - synthesis of tripeptide - merrifield synthesis - determination of tertiary structure of protein - biosynthesis of proteins - nucleic acids - types - DNA & RNA polynucleotide chain - components - biological functions - structure and role of (genetic Code) DNA and RNA (nucleotides only) - Biosynthesis of cholesterol.

UNIT-IV: ANTIBIOTICS

Introduction - structural elucidation and synthesis of penicillin – streptomycin - chloromycetin and tetracyclines.

UNIT-V: DYES

Introduction - classification and various methods of dyeing - preparations and applications of dyes - Nitroso dyes - Azodyes - Fast green - Methyl Orange - Methyl Red - Fast Red - Triphenylmethane dyes - Malachite green - Rosaniline - Aniline blue - Crystal violet - Xanthene dyes - Fluorescein - Rhodamine-B - Anthroquinone dyes - Alizarin.

Recommended Books:

1. Charles H. Depey and Orville, Molecular Reaction and Photochemistry, L. Chapman, Prentice Hall of India Pvt., Ltd., New Delhi.
2. Eric E. Conn, Paul. R. Stumpf, George Bruening and Roy H. Dole, Outlines of Biochemistry, V Edition, John Wiley and Sons.
3. Francis A. Carey and Richard J. Sandburg Advanced Organic Chemistry, Plenum Press, New York.
4. I. L. Finar, Organic Chemistry, Vol. II, V Edition ELBS publication.
5. J. March, Advanced organic reaction mechanism and structure, Tata McGraw Hill.
6. L. Smith, Robert L. Hill I. Robert Lehman, Robert J. Let Rowitz, Philip Handlar and Abraham white, Principles of Biochemistry General Aspects, VII Edition McGraw Hill Int.,
7. Lubert Stryer, Biochemistry, Freeman and Co., New York.
8. O.P. Agarwal, Chemistry of organic Natural Products, Goel Publishing House, Meerut.

PAPER-11
INORGANIC CHEMISTRY - IV

OBJECTIVE:

To study about the Inorganic Spectroscopy and Nuclear Chemistry.

UNIT-I: INORGANIC SPECTROSCOPY - I

Applications to inorganic systems of the following: ultra violet, visible, infra-red and Raman spectra of metal complexes, organometallic and simple inorganic compounds with special reference to coordination sites and isomerism.

UNIT-II: INORGANIC SPECTROSCOPY - II

Application to Inorganic systems of the followings
NMR, NQR and Mossebauer spectra - NMR of ^{31}P , ^{19}F , NMR shift reagents. NQR - Nitrosyl compounds. Mossebauer spectra of Fe and Sn systems.

UNIT-III: INORGANIC SPECTROSCOPY - III

ESR Introduction - Zeeman equation, g-value, nuclear hyperfine splitting, interpretation of the spectrum, simple carbon centered free radicals. Anisotropy - g-value and hyperfine splitting constant. McConnell's equation, Kramer's theorem. ESR of transition metal complexes of copper, manganese and vanadyl complexes.

Photoelectron spectroscopy (UV and X-ray) - photo electron spectra - Koopman's theorem, fine structure in PES, chemical shift and correlation with electronic charges.

UNIT-IV: INSTRUMENTAL ANALYSIS - I

AAS, AES and AFS – Principle, instrumentation and applications, advantages of AAS, interferences; GLC and HPLC – Principle, instrumentation and working, types of detectors; Inductively coupled plasma spectroscopy (ICP)- introduction, instrumentation, interferences and applications.

UNIT-V INSTRUMENTAL ANALYSIS - II

Laser Raman spectroscopy - principle, interfaces, advantages and applications.
Magnetic susceptibility and its determination - Guoy method, Faraday method and applications.
Polarography and Amperometry - Principle, instrumentation and applications.

TEXT BOOKS

1. A. Earnshaw, Introduction to Magneto Chemistry, Academic Press, London, (1968).
2. C.N.R. Rao, I.R. Ferraro, Spectroscopy in Inorganic Chemistry, Vol. I and Vol. II, Academic Press, (1970).
3. D. A. Skoog and D.M. West, Principles of Instrumental Methods of Analysis, Saunders's College Publ. III Edition, (1985).
4. E. A. V. Ebsworth, D. W. H. Rankin and S. Cradock, Structural Methods in Inorganic Chemistry, II Edition, Blackwell Scientific Publications, Oxford, London (1991).
5. G.D. Christian and J.E.G. Reily, Instrumental Analysis, Allyn Bacon, II Edition, (1986).
6. H.A. Strobel, Chemical Instrumentation, Addison - Wesley Pub. Co., (1976).
7. R. S. Drago, Physical Methods for Chemists, Saunders College Publishing, Philadelphia (1992).
8. Willard Merritt, Dean and Settle, Instrumental methods of analysis, CBS Publ. VI edition, (1986).

Suggested References

1. AI Vogel, Text book of Qualitative Analysis - IV Edition (1985).
2. C. N. Banwell and E.M. Mc Cash, Fundamentals of Molecular Spectroscopy, IV edition, Tata McGraw Hill, New Delhi (1994).
3. D.A. Skoog D.M. West, Holt Reinhert and Winston, Fundamental of Analytical Chemistry, Publication, IV Edition (1982).
4. D.N. Sathyanarayana, Electronic Absorption Spectroscopy and Related Techniques, Universities Press (India) Ltd., Hyderabad (2001).
5. FA Cotton and G Wilkinson, Advanced Inorganic Chemistry, John Wiley and Sons, V Edition (1988).
6. G. Aruldas, Molecular Structure and spectroscopy, Prentice Hall of India Pvt. Ltd., New Delhi (2001).
7. J. Huheey, Inorganic Chemistry, Harper and Collins, NY, IV Edition, (1993).
8. J. M. Hollas, Modern Spectroscopy, IV edition, John Wiley & Sons, Ltd., Chichester (2004).
9. M.C. Shrivvers, P.W Atkins, CH. Langford, Inorganic Chemistry, OUP (1999).
10. Nakamoto, Infrared and Raman Spectra of Inorganic and Coordination Compounds, III Edn., John Wiley and Sons, New York, (1986).
11. O. Khan, Molecular Magnetism, New York, VCH (1993).
12. R.L. Carlin, Magneto chemistry, Springer-Verlag, New York, (1986).
13. S.F.A. Kettle, Physical Inorganic Chemistry: A Coordination Chemistry Approach, Oxford University Press, (1998)

PAPER-12
PHYSICAL CHEMISTRY-IV

OBJECTIVE

To study the principles of photochemical reactions. To study the Experimental methods and kinetics studies of photochemical reactions. Study of electrode - electrolytic interface. To study the fundamental principles of quantum chemistry and its application to chemical bonding. Schrödinger wave equation and its applications. To study statistical thermodynamics, quantum statistics and irreversible thermodynamics.

UNIT- I: PHOTOCHEMISTRY - I

Absorption and emission of radiation - Franck - Condon Principle - decay of electronically excited states - Jablonski diagram - radiative and non-radiative processes - fluorescence and phosphorescence - spin forbidden radiative transition - Internal conversion and intersystem crossing - energy transfer process - kinetics of unimolecular and bimolecular photophysical processes - excimers and exciplexes - static and dynamic quenching - Stern-Volmer analysis.

UNIT- II: PHOTOCHEMISTRY - II

Experimental methods - quantum yield and life time measurements - steady state principle - quantum yield and chemical actinometry.

Kinetics of photochemical reactions: hydrogen and halogen reactions,

Brief study about photoredox, photosubstitution, photoisomerization and photosensitized reactions - photovoltaic and photogalvanic cells, photo electrochemical cells, photo-assisted electrolysis of water, aspects of solar energy conversion.

UNIT- III: QUANTUM CHEMISTRY - I

Failure of classical mechanics - Compton effect - wave particle duality - uncertainty principle - waves - wave equation for electrons - quantum mechanical postulates - The concept of operators - Hermitian property. Schrodinger wave equation - application of Schrodinger's equation - the particle in a box (one, and three dimensional cases) - particle in a ring, solution to rigid rotor and harmonic oscillator. Schrodinger equation for hydrogen atom (no derivation is required) and the solutions.

UNIT- IV: QUANTUM CHEMISTRY - II

Approximation methods - Perturbation and Variation methods - application to hydrogen

molecule and helium atoms. Born - Oppenheimer approximation - valence bond theory for hydrogen molecule - LCAO - MO theory for diatomic molecules. Concept of hybridization - Huckel theory for conjugated molecules (Ethylene, butadiene and benzene).

UNIT- V: STATISTICAL THERMODYNAMICS - II

Thermodynamic functions in terms of partition functions - application of partition function to heat capacity of ideal gases - nuclear partition function - contribution to heat capacity of ortho and para hydrogen. Heat capacity of solids - Einstein and Debye models, Negative Kelvin temperature. Entropy of monoatomic gases - Sackur-Tetrode equation.

Irreversible thermodynamics - forces and fluxes - linear force - flux relation - phenomenological equations.

TEXT BOOKS

N.J.Turro, Modern Molecular Photochemistry, Benjamin, Cumming, Menlo Park, California (1978).

K.K.Rohatgi, Mukherjee, Fundamentals of Photochemistry, Wiley Eastern Ltd., (1978).

R.K. Prasad, Quantum Chemistry, Wiley Eastern, New Delhi (1992).

D.A. Mcquarrie, Quantum Chemistry, University Science Books, Mil Valley, California (1983).

Quantum Chemistry, Allyn and Bacon, Boston (1983).

R.Anantharaman, Fundamentals of Quantum Chemistry, Mac Millan India Limited (2001).

M.W. Hanna, Quantum Mechanics in Chemistry, W.A. Benjamin Inc. London (1965).

M.C.Gupta, Statistical thermodynamics, Wiley Easter, New Delhi (1990).

R.Hasee, Thermodynamics Of Irreversible Process, Addition Wesley, Reading, Mass (1969).

L.K. Nash, Elements of Chemical Thermodynamics, Addison Wesley (1962).

G.M. Barrow, Physical Chemistry, McGraw Hill (1988).

R.L. De Koch and H.B. Gray, Chemical Structure and Bonding, Benjamin- Cumming, Menlo Park, California. S.Glasstone, Text Book of Physical Chemistry.

Suggested References

A.K. Chandra, Introductory Quantum Chemistry, Tata Mc Graw Hill.

D.A. Mc Quarrie, Quantum Chemistry, University Science Books, Mill Valley, California (1983).

P.W. Atkins, Molecular Quantum Mechanics, Oxford University Press, Oxford (1983).

J.G.Clavert and J.N.Pitts, Photochemistry, Wiley, London (1966).

R.P.Wayne, Photochemistry, Butterworths, London (1970).

B.J.Mc Clenlland, Statistical Thermodynamics, Chapman and Hall, London (1973).

Cleyde, Physical Chemistry, Schaum Series, Mc Graw Hill (1976).

Dole, Thermodynamics, Prentice Hall, New York (1954).

Prigogine, Introduction to Thermodynamics of Irreversible Process, Interscience, New York (1961).

N.O.Smith, Elementary Statistical Thermodynamics - A Problem Approach, Plenum Press, New York (1961).

G.Clavert and J.N.Pitts, Photochemistry, Wiley, London (1966).

R.P.Wayne, Photochemistry, Butterworths, London (1970).

Francis W Sears and Gerhard L Salinger, Thermodynamics, kinetic theory, and statistical thermodynamics.

**ELECTIVE
PAPER- 4
(to choose 1 out of 3)**

A. ENVIRONMENTAL CHEMISTRY

OBJECTIVES:

To understand the concept of different types of pollution. To learn the various techniques involved in the analysis of pollutants. To know the methods for the control of pollution

UNIT-I AIR POLLUTION AND WATER POLLUTION

Classification of air pollution according to origin, chemical composition and state of matter - effects of air pollutants on living and nonliving things - ambient air quality standards - problems of air pollution in India - pollutions in industrial area (cement industry and thermal power plant) - Effect and consequences of air pollution: acid rain, green house effect, global warming and ozone depletion - major air pollution disasters - Bhopal Gas Leak - Chernobyl Nuclear Accident and Three Mile Island disaster.

Classification of water pollutants: DOD, BOD and COD - Effects of water pollutant on life and Environment.

UNIT-II SAMPLING AND ANALYSIS OF WATER AND AIR POLLUTANTS

Methods of sampling of gaseous, liquid and solid pollutant - analysis and effect of sulfur oxides, nitrogen oxides and carbon monoxide - biochemical effects and toxicology of Cd, Cr, As, Pb and Cu. Environmental implications of fertilizers, insecticides, pesticide - effect of pesticide residue on life - analytical techniques for pesticides residue analysis (Neutron Activation Analysis, Anodic Stripping Voltammetry and Atomic Absorption Spectroscopy) .

UNIT-III METHODS OF CONTROL OF AIR AND WATER POLLUTION

Methods of control of air pollution: Electrostatic precipitations - wet and dry scrubber, filters, gravity and cyclonic separation - adsorption, absorption and condensation of gaseous effluent.

Methods of control of water pollution: Water and waste water treatment - aerobic and anaerobic - aeration of water - principle of coagulation, flocculation, softening, disinfection, demineralization and fluoridation.

UNIT – IV NOISE POLLUTION

The decibel scale - effect: physiological, psychological, acute and chronic - Measurement of noise level (Sound level meter, Magnetic tap recorder, noise limit indicator) - noise control in industries: Administrative, engineering and path control - Protection of the persone (ear plugs, ear muffs. Helmets) - acoustic absorptive materials - noise control methods in industrial plants.

UNIT-IV RADIOACTIVE POLLUTION

Classification: Non-ionizing and ionizing radiation - radioactive pollution and their sources - natural and anthropogenic - biological effect of radiation on the human body - radiation doses -preventive measure from nuclear radiation - regulations from safety measure.

Radioactive wastes: Classification - low level and high level - radioactive waste disposal - geological disposal - ocean dumping - sub-sea bed dumping - subductive waste disposal method - transmutation of high - level radioactive waste - radioactive waste management in India.

TEXT BOOKS

1. S.S Dara ,“ A Text Book of Environmental chemistry and Pollution Control “,S.. Chand & company Ltd, New Delhi
2. V. K. Ahluwalia,” Environmental chemistry”, Ane Books India, Chennai.
3. Anu Gopinath and Chandradasan, Environmental Chemistry., Vishal Publishing Co, Delhi.

REFERENCE BOOKS

1. A. K. De. “Environmental Pollution”, New age intenational publishers, New Delhi
2. G. S. Sodhi, “Fundamental Concepts of Environmental Chemistry”, Narosa Publishing House, New Delhi.
3. S.M. Khopkar, Environmental Pollution Analysis,
4. S. P.Mahajan, Pollution control in process industries.

<http://www.nios.ac.in/media/documents/313courseE/L36.pdf>

<http://www.iisc.ernet.in/currsci/dec252001/1534.pdf>

<http://www.sciencelog.net/2014/12/radioactive-pollution-causes-and-effect.html>

http://collegesat.du.ac.in/UG/Envinromental%20Studies_ebook.pdf

PAPER- 4

B. INORGANIC PHOTOCHEMISTRY

UNIT-I: BASICS OF PHOTOCHEMISTRY

Absorption, excitation, photochemical laws, quantum yield, electronically excited states, life times-measurements of the times. Flash photolysis, energy dissipation by radiative and non-radiative processes, absorption spectra, Frank-Condon principle, photochemical stages-primary and secondary processes.

UNIT-II: EXCITED STATES OF METAL COMPLEXES

Excited states of metal complexes: Comparison with organic compounds, electronically excited states of metal complexes, charge transfer spectra and charge transfer excitations.

UNIT-III: LIGAND FIELD PHOTOCHEMISTRY

Photosubstitution, photooxidation and photoreduction, lability and selectivity, zero vibrational levels of ground state and excited state, energy content of excited state, zero-zero spectroscopic energy, development of the equations for redox potentials of the excited states.

UNIT-IV: REDOX REACTIONS BY EXCITED METAL COMPLEXES

Energy transfer under condition of a weak interaction and strong interaction-examples formation; condition of the excited states to be useful as redox reactants, excited electron transfer, metal complexes as attractive candidates, (2,2-bipyridine and 1,10-phenanthroline complexes), illustration of reducing and oxidising character of Ru (II) (bipyridal complex, comparison with Fe(bipy); role of spin-orbit coupling-life time of these complexes. Application of redox processes of electronically excited states for catalytic purposes, transformation of low energy reactants into high energy products and conversion of chemical energy into light.

UNIT-V: METAL COMPLEX SENSITIZERS

Metal complex sensitizers, electron relay, metal colloid systems, semiconductor supported metal or oxide systems, water photolysis, nitrogen fixation and carbon dioxide reduction.

Book Suggested:

1. Concepts of Inorganic Photochemistry, A.W. Adamson and P.D. Fleischauer, Wiley.
2. Inorganic Photochemistry, J.Chem. Educ. vol. 60 No. 10, 1983.
3. Progress in Inorganic Chemistry, Vol. 30ed. S.J. Lippard. Wiley.
4. Coordination Chem. Revs. 1981, vol. 39, 121, 1231, 1975, 14, 321,; 1990 97, 313.
5. Photochemistry of Coordination Compounds, V. Balzari and V. Carassiti, Academic Press.
6. Elements of Inorganic Photochemistry, G.J. Ferraudi, Wiley.
7. S.Arunachalam, "Inorganic Photochemistry - An Introduction to Photochemical and Photophysical Aspects of Metal Complexes", Kala Publications, Tiruchirappalli, India, 2002.
8. D.M. Roundhill, "Photochemistry and photophysics of Metal complexes", Springer; Edition, 1994

PAPER – 4

C. MEDICINAL CHEMISTRY AND DRUG DESIGN

Objectives:

Students should be able to understand concepts of drug design and mechanism of drug action of different drugs. Students will be aware of metabolism and delivery methods of different classes of drugs.

UNIT-I: DRUG DESIGN

Development of new drugs, concepts of pro-drugs and soft drugs, Principles of drug design, Quantitative structure activity relationships. History and development of QSAR (Quantitative Structure Activity Relationships) - Concepts of drug parameters. High throughput Screening.

UNIT-II: IMPORTANCE AND MECHANISM OF DRUG ACTION

Antibiotics: Drug action of penicillin, cephalosporin, tetracycline and macrocyclic antibiotics (no synthesis). Antimalarials: Trimethoprim- NSAIDs: Paracetamol, Meperidine, Aminopyrine-Ibuprofen, Oxyphenylbutazone, Diclophenac sodium, Indomethacin-Antitubercular and antileprotic: Ethambutol, Isoniazide and Daspace - Anaesthetics: Lidocaine, - Antihistamines: Phenobarbital, Diphenylhydramine- Tranquilizers: Diazepam, Trimeprazine, Thiopental - Anti AIDS agents: Acyclovir, Ganciclovir.

UNIT-III: PHYSICO-CHEMICAL FACTORS AND BIOLOGICAL ACTIVITIES

Physical properties - Features governing drug action - Structurally specific - nonspecific drugs -Thermodynamic activity - Theories - Cut-off point - Factors governing ability of drugs -Absorption - Distribution - Excretion - Biotransformation - Intramolecular distances -Dissociation constants - Isosterism and Bioisosterism.

UNIT-IV: CLASSIFICATION OF MEDICINAL COMPOUNDS

Central Nervous system acting drugs – (General and Local anaesthetics, Sedatives and Hypnotics, Anticonvulsants, Narcotic and Non-narcotic analgesics, Anti-Parkinsonian agents, Anti-depressants, Tranquilizers, Psychomimetics) - Pharmacodynamic agents (Anti-arrythmics, Anti-anginals, Vasodialators, Anti-hypertensives, Diuretics, Antihistamines) - Chemotherapeutic Agents (Antibiotics, Antivirals, Antifungals) - Drugs for metabolic and endocrine disorders (Anti-thyroid drugs, Anti-diabetic drugs, biosynthetic insulin) – Therapeutic Index (Definitions with examples).

UNIT-V: DRUG ANALYSIS

Principles of quantitative analysis of the following drugs in formulations: Aspirin - benzyl penicillin - ascorbic acid - isoniazid - codeine - chloramphenicol - riboflavin and folic acid.

Reference Books

1. Burger's Medicinal Chemistry & Drug discovery, Vol 1-3, 5th Ed, 1995.
2. Wilson, Gisvold & Dorque: Text book of Organic Medical and Pharmaceutical Chemistry, 10th Ed, Lippincott publishers, 1998.
3. David A Williams, William O. Foye & Thomas L. Lemke, Foye's Principles of medicinal Chemistry, 6th Edition, Lippincott Williams & Wilkins, 2002.
4. Zubay G, Biochemistry, Maxwell Macmillan International Editions, second edition, 1987.
5. R. L. Foster, The Nature of Enzymology, Croom Helm, 1980.
6. D. L. Purich, (Ed), Contemporary Enzyme kinetics and Mechanisms, Academic Press, 1983.
7. Dugas H, Bio-organic Chemistry, A chemical approach to enzyme action, Springer 2003.
8. Chemistry of drug design and drug action-. R. B. Silverman (2004) Acad. press
9. Graham Patrick, An Introduction to Medicinal Chemistry- 2nd Edn. Qxford, 2010
10. N. K. Jain, Advances in Controlled and Novel Drug Delivery, CBS, 2001.
11. Lednicher, The Organic Chemistry of Drug Synthesis, Vol. 1, 5th Edition, John Wiley & Sons, 2001.
12. Foye's Principles of Medicinal Chemistry, Sixth Edition, Wolters Kluwer, 2008
13. G.R. Chatwal, Medicinal Chemistry, Himalaya Publishing House.
14. V.K. Ahluwalia and M. Chopra, Medicinal Chemistry, Ane Book Pvt. Ltd., 2008.
15. J. B. Taylor and P. D. Kenewell., Introductory medicinal chemistry.
16. D. C. Garratt., Quantitative analysis of drugs.
17. G. L. Patrick., An introduction to medicinal chemistry.
18. Beckett and Stenlake., Practical pharmaceutical chemistry. Vol 1 and 2.

**MAIN PRACTICAL
PRACTICAL PAPER-4
ORGANIC CHEMISTRY PRACTICAL- II**

I. ANY SIX PREPARATIONS FROM THE FOLLOWING INVOLVING TWO STAGES

1. sym-Tribromo benzene from aniline (bromination, diazotization and hydrolysis)
2. Benzanilide from benzophenone (addition and Beckmann rearrangement)
3. m-Nitro benzoic acid from methyl benzoate (nitration and hydrolysis)
4. 2, 4.- Dinitrobenzoic acid from p-nitrotoluene (oxidation and nitration)
5. m-Nitro benzoic acid from benzaldehyde (oxidation and nitration)
6. Benzil from benzaldehyde (rearrangement)
7. Anthraquinone from phthalic anhydride (Friedel Crafts reaction)
8. Acetyl salicylic acid from methyl salicylate (hydrolysis and acetylation)
9. 2- Phenyl indole from phenyl hydrazine (Fischer indole reaction)
10. m-nitroaniline from nitrobenzene (nitration and reduction)

II. ANY TWO EXERCISES IN THE EXTRACTION OF NATURAL PRODUCTS

1. Caffeine from tea leaves
2. Lactose from milk
3. Citric acid from lemon
4. Piperine from black pepper

III. CHROMATOGRAPHIC SEPARATIONS

1. Column chromatography - Separation of anthracene and picric acid from anthracene picrate.
2. Thin layer chromatography - Separation of green leaf pigments.
3. Paper chromatography - Identification of amino acid.

IV. ANY FIVE ESTIMATIONS

1. Estimation of aniline
2. Estimation of phenol
3. Estimation of glucose
4. Estimation of ethyl methyl ketone
5. Estimation of amino group
6. Estimation of amide group
7. Saponification of fat or an oil
8. Iodine value of an oil
9. Estimation of sulphur in an organic compound

**V.SPECIAL INTERPRETATION OF ORGANIC COMPOUNDS USING UV, IR,
PMR AND MASS SPECTRA OF THE FOLLOWING 15 COMPOUNDS**

[See ANNEXURE – I]

Recommended Books

Arthur I.Vogel, A text book of Practical Organic Chemistry, ELBS

Raj K. Bansal, Laboratory Manual of Organic Chemistry, Wiley Eastern limited.

UNIVERSITY EXAMINATION MARKS

| University Examination | Marks |
|---------------------------|-----------|
| Estimation | 25 |
| Preparation | 25 |
| Interpretation of spectra | 10 |
| Viva Voce | 10 |
| Record | 05 |
| Total | 75 |

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

PRACTICAL PAPER - 5
INORGANIC CHEMISTRY PRACTICAL - II

I. ANALYSIS OF ORES

1. Determination of percentage of calcium and magnesium in dolomite.
2. Determination of percentage of MnO_2 in pyrolusite.
3. Determination of percentage of lead in galena.

II. ANALYSIS OF ALLOYS

1. Estimation of tin and lead in solder.
2. Estimation of copper and zinc in brass.
3. Estimation of chromium and nickel in stainless steel.

III. ANALYSIS OF INORGANIC COMPLEX COMPOUNDS

1. Preparation of cis and trans potassium bis (oxalato) diaquochromate(III) and analysis of each of these for chromium.
2. Preparation of potassium tris (oxalato) ferrate (III) and analysis for iron and oxalate.

IV. QUANTITATIVE ANALYSIS OF THE FOLLOWING MIXTURES
(one by volumetric and one by gravimetric method)

1. Copper and Nickel
2. Copper and Zinc
3. Iron and Nickel
4. Iron and Magnesium

V. COLORIMETRIC ANALYSIS USING PHOTOELECTRIC METHOD

1. Estimation of iron
2. Estimation of nickel
3. Estimation of manganese
4. Estimation of copper

VI. AMPEROMETRIC TITRATIONS (With dead stop endpoint)

1. Thiosulphate - iodine system
2. Iron (II) - cerium (IV) systems.

Reference book.

N.N. Greenwood and A. Earnshaw, Chemistry of the Elements, Vol.II, Pergamon Press (1997)

VII. SPECTRAL INTERPRETATION OF THE FOLLOWING INORGANIC COMPOUNDS

[See ANNEXURE – II]

UNIVERSITY EXAMINATION MARKS

| University Examination | Marks |
|--|--------------|
| I. Estimation of mixture containing two metal ions | |
| procedure | 5 |
| Volumetric analysis | 15 |
| Gravimetric analysis | 10 |
| II. Colorimetric estimation (or) Amperometric titration | |
| Estimation | 15 |
| Procedure | 5 |
| III. Interpretation of spectra | 10 |
| Viva Voce | 10 |
| Record | 05 |
| Total | 75 |

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

PRACTICAL PAPER-6
PHYSICAL CHEMISTRY PRACTICAL- II

EXPERIMENTS IN ELECTROCHEMISTRY:
CONDUCTOMETRY, POTENTIOMETRY, PH METRY AND SPECTROSCOPY.

I.CONDUCTIVITY MEASUREMENTS

1. Determination of equivalent conductance of a strong electrolyte and verification of Debye - Huckel - Onsager Equation
2. Verification of Debye-Huckel limiting law
3. Verification of Ostwald's Dilution law for a weak electrolyte.
4. Determination of pK_a values of weak acids and weak bases.
5. Conductometric titrations between acid (simple and mixture of strong and weak acids) - base,
6. Precipitation titrations including mixture of halides.

II. E.M.F MEASUREMENTS

1. Determination of standard potentials (Copper, Silver & Zinc)
2. Determination of thermodynamic quantities from EMF measurements –
3. Potentiometric titrations – Neutralization reactions
4. Determination of pH of buffer solution and calculation of pK_a .
5. Determination of stability constant of a complex.
6. Determination of solubility product of a sparingly soluble salt.
7. Potentiometric titrations – Redox titrations.
8. Potentiometric titrations – Precipitation titration of mixture of halides by EMF measurements.

III. SPECTROSCOPY: INTERPRETATION OF SPCTRA [See ANNEXURE – III].

1. Experiments given only to familiarize the interpretation of spectra provided.
2. Interpretation of UV-Visible spectra of simple molecules for the calculation of molecular data
3. Identification of functional groups (5 typical spectra will be provided).
4. IR and NMR spectral calculations of force constant and coupling constants respectively
5. Identification and interpretation of a spectra (5 each in IR and NMR will be provided)

LIST OF EXPERIMENTS SUGGESTED FOR PHYSICAL CHEMISTRY PRACTICAL II

Typical list of possible experiments are given.

Experiments of similar nature and other experiments may also be given.

The list given is only a guideline.

Any 15 experiments have to be performed in a year.

1. Determination of the equivalent conductance of a weak acid at different concentrations and verify Ostwald's dilution law and calculate the dissociation constant of the acid.
2. Determination of equivalent conductance of a strong electrolyte at different concentrations and examine the validity of the Onsager's theory as limiting law at high dilutions.
3. Determination of the activity co-efficient of Zinc ions in the solution of 0.002M Zinc sulphate using Debye-Huckel limiting law.
4. Determination of the solubility product of silver bromate and calculate its solubility in water and in 0.01 M KBrO_3 using Debye-Huckel limiting law.
5. Conductometric titrations of a mixture of HCl , CH_3COOH and CuSO_4 and NaOH .
6. Determination of the dissociation constant of an acid at different dilution.
7. Determination of the solubility of the lead iodide in water, 0.04 M KI and 0.04 M $\text{Pb}(\text{NO}_3)_2$ at 298 K
8. Determination of the solubility product of leadiodide at 298 K and 308 K and calculate the molar heat of solution of lead iodide.
9. Compare the relative strength of acetic acid and mono chloroacetic acid by conductance method.
10. Determine the basicity of organic acids (oxalic /benzoic).
11. Determine the electrode potentials of Zn and Ag electrodes in 0.1M and 0.001M solutions at 298 K and find the standard potentials for these electrodes and test the 12.
12. Determine the activity co-efficient of an electrolyte at different molalities by EMF measurements.
13. Determine the dissociation constant of acetic acid titrating it with sodium hydroxide using quinhydrone as an indicator electrode and calomel as a reference electrode.

14. Study of the electrolytic separation of metals (Ag, Cu, Cd and Zn)
15. Determine the strength of a given solution of KCl using differential potentiometric titration technique.
16. Determine the dissociation constant of acetic acid in DMSO, DMF, acetone and dioxane by titrating it with KOH.
17. Determine the transport number of Ag ions and nitrate ions by Hittorf's method.
18. Determine the transport number of cadmium ions and sulphate ions by measuring emf of concentration cells with and without transference.
19. Determine the dissociation constant of monobasic or dibasic acid by all the Alber-Serjeant method.
20. Determine the pH of the given solution with the help of indicators using buffer solutions and by colorimetric method.
21. Perform acid-base titration in a non aqueous medium.
22. Determine the pH of a given solution by EMF method using glass and calomel electrodes and evaluate pK_a value of an acid.
23. Determine the pH of a given solution by emf methods using hydrogen electrode and quinhydrone electrode.
24. Estimate the concentration of cadmium and lead ions by successive reduction in polarography. Verify Ilkovic equation.
25. Determine lead ion by amperometric titrations with potassium dichromate.
26. Determine ferric ion by amperometric titration.
27. Determine pH value of an acid-base indicator (methyl red) by colorimetry.
28. Determine the composition and instability constant of a complex by mole ratio method.
29. By colorimetry determine simultaneously Mn and Cr.
30. Study the effect of solvent on the conductivity of AgNO₃/acetic acid and determine the degree of dissociation and equilibrium constant in different degree of dissociation and mixtures (DMSO, DMF, dioxane, acetone, water) and test the validity of Debye-Huckel Onsager's equation.
31. Determine the solubility of Ca(TiO₃)₂ in deionised water and in dilute solution of KCl at 298 K. Determine the solubility product graphically.
32. Determine the equivalent conductivity of a Ca electrolyte and dissociation constant of the electrolyte.
33. Determine the equivalent dissociation constant of a polybasic acid.
34. Calculate the thermodynamic parameters for the reaction $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$ by emf method.

35. Determine the formation constant of silver-ammonia complex and stoichiometry of the complex potentiometrically.
36. Determine the stability constant of a complex by polarographic method.
- 37.** Determine the g value from a given ESR spectrum.

M. Sc. Chemistry: Syllabus (CBCS)

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UNIVERSITY EXAMINATION MARKS

| University Examination | Marks |
|-------------------------------|--------------|
| Procedure | 10 |
| Manipulation | 25 |
| Result | 15 |
| Interpretation of spectra | 10 |
| Viva Voce | 10 |
| Record | 05 |
| Total | 75 |

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

| Internal assessment | Marks |
|----------------------------|--------------|
| Two Tests | 10 |
| Results accuracy | 10 |
| Attendance/ Regularity | 5 |
| Total | 25 |

THIRUVALLUVAR UNIVERSITY
MASTER OF SCIENCE
DEGREE COURSE
M.Sc. MATHEMATICS
UNDER CBCS
(with effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

| S.NO. | Study Components | | Ins. hrs /week | Credit | Title of the Paper | | Maximum Marks | | |
|-----------------|------------------|---------|-------------------|--------|---|--|---------------|--------------|-------|
| | Course Title | | | | | | | | |
| SEMESTE R I | | | | | | | CIA | Uni. Exam | Total |
| 1 | MAIN | Paper-1 | 6 | 5 | Algebra I | | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | Real Analysis I | | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 6 | 4 | Ordinary Differential Equations | | 25 | 75 | 100 |
| 4 | MAIN | Paper-4 | 6 | 5 | Differential Geometry | | 25 | 75 | 100 |
| 5 | ELECTIVE | Paper-1 | 6 | 3 | (to choose 1 out of 4) A. Finite Element Method B. Discrete Mathematics C. Graph Theory D. Reliability & Queueing Theory | | 25 | 75 | 100 |
| | | | | | | | | | |
| | | | 30 | 22 | | | 125 | 375 | 500 |
| | | | | | | | | | |
| SEMESTE R II | | | | | | | CIA | Uni. Exam | Total |
| 6 | MAIN | Paper-5 | 5 | 4 | Algebra II | | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 6 | 5 | Real Analysis II | | 25 | 75 | 100 |
| 8 | MAIN | Paper-7 | 6 | 5 | Partial Differential Equations | | 25 | 75 | 100 |
| 9 | MAIN | Paper-8 | 6 | 4 | Mechanics | | 25 | 75 | 100 |
| 10 | Compulsory Paper | | 2 | 2 | Human Rights | | 25 | 75 | 100 |
| 11 | ELECTIVE | Paper-2 | 5 | 3 | (to choose 1 out of 4) A. *Programming in C++ - Practical B. Fuzzy Mathematics C. Calculus of Variations and Integral Equations D. Mathematical Modelling | | 25 | 75 | 100 |
| | | | 30 | 23 | | | 150 | 450 | 600 |
| | | | | | | | | | |

M.Sc. Mathematics : Syllabus (CBCS)

| SEMESTER III | | | | | | CIA | Uni. Exam | Total |
|--------------|----------|----------|----|----|--|-----|--------------|-------|
| 12 | MAIN | Paper-9 | 6 | 5 | Complex Analysis I | 25 | 75 | 100 |
| 13 | MAIN | Paper-10 | 6 | 5 | Topology | 25 | 75 | 100 |
| 14 | MAIN | Paper-11 | 6 | 5 | Operations Research | 25 | 75 | 100 |
| 15 | MAIN | Paper-12 | 6 | 5 | Probability Theory | 25 | 75 | 100 |
| 16 | ELECTIVE | Paper-3 | 6 | 3 | (to choose 1 out of 4) A. Tensor Analysis and Relativity Theory B. Analytic Number Theory C. Fluid Dynamics D. Algebraic Topology | 25 | 75 | 100 |
| | | | 30 | 23 | | 125 | 375 | 500 |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 17 | MAIN | Paper-13 | 6 | 5 | Complex Analysis II | 25 | 75 | 100 |
| 18 | MAIN | Paper-14 | 6 | 5 | Functional Analysis | 25 | 75 | 100 |
| 19 | MAIN | Paper-15 | 6 | 5 | Mathematical Statistics | 25 | 75 | 100 |
| 20 | MAIN | Paper-16 | 6 | 4 | Difference Equations | 25 | 75 | 100 |
| 21 | ELECTIVE | Paper-4 | 6 | 3 | (to choose 1 out of 4) A. Number Theory and Cryptography B. Algebraic Number Theory C. Stochastic Processes D. *Mathematical Softwares – Practical | 25 | 75 | 100 |
| | | | 30 | 22 | | 125 | 375 | 500 |

***Programming in C++ and Mathematical Software Practical's:**

External = 75 Marks = 60 (Practical) + 15 (Record)

Internal (CIA) = 25 Marks = 20 (Test) + 5 (Observation)

| Subject | Papers | Credit | Total Credit | Marks | Total Marks |
|------------------|---------------|---------------|---------------------|--------------|--------------------|
| Main | 16 | 4 - 5 | 76 | 100 | 1600 |
| Elective | 4 | 3 | 12 | 100 | 400 |
| Compulsory Paper | 1 | 2 | 2 | 100 | 100 |
| Total | 21 | --- | 90 | --- | 2100 |

THIRUVALLUVAR UNIVERSITY
M.Sc. MATHEMATICS
SYLLABUS
UNDER CBCS
(with effect from 2017 - 2018)
SEMESTER - I
PAPER - 1
ALGEBRA - I

Objectives : To introduce the concepts and to develop working knowledge on class equation, finite abelian groups, linear transformations, real quadratic forms.

UNIT-I

Another counting principle - class equation for finite groups and its applications - Sylow's theorems (For theorem 2.12.1, Only First proof).

Chapter 2: Sections 2.11 and 2.12

UNIT-II

Direct products - Finite abelian groups- Modules

Chapter 2: Sections 2.13 and 2.14 (Only Theorem 2.14.1)

Chapter 4: Section 4.5

UNIT-III

Linear Transformations: Canonical forms - Triangular form - Nilpotent transformations.

Chapter 6: Sections 6.4 , 6.5

UNIT-IV

Jordan form - rational canonical form.

Chapter 6 : Sections 6.6 and 6.7

UNIT-V

Trace and transpose - Hermitian, unitary, normal transformations, real quadratic form.

Chapter 6 : Sections 6.8, 6.10 and 6.11

Recommended Text

I.N. Herstein. *Topics in Algebra* (II Edition) Wiley Eastern Limited, New Delhi, 1975.

Reference Books

1. M.Artin, *Algebra*, Prentice Hall of India, 1991.
2. P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul, *Basic Abstract Algebra* (II Edition) Cambridge University Press, 1997. (Indian Edition)
3. I.S.Luther and I.B.S.Passi, *Algebra*, Vol. I –Groups(1996); Vol. II Rings, Narosa Publishing House , New Delhi, 1999
4. D.S.Malik, J.N. Mordeson and M.K.Sen, *Fundamental of Abstract Algebra*, McGraw Hill (International Edition), New York. 1997.
5. N.Jacobson, *Basic Algebra*, Vol. I & II W.H.Freeman ; also published by Hindustan Publishing Company, New Delhi, 1980.

PAPER - 2
REAL ANALYSIS - I

Objectives : To work comfortably with functions of bounded variation, Riemann - Stieltjes Integration, convergence of infinite series, infinite product and uniform convergence and its interplay between various limiting operations.

UNIT-I : FUNCTIONS OF BOUNDED VARIATION

Introduction - Properties of monotonic functions - Functions of bounded variation - Total variation - Additive property of total variation - Total variation on $[a, x]$ as a function of x - Functions of bounded variation expressed as the difference of two increasing functions - Continuous functions of bounded variation.

Chapter - 6 : Sections 6.1 to 6.8

UNIT-II : THE RIEMANN - STIELTJES INTEGRAL

Introduction - Notation - The definition of the Riemann - Stieltjes integral - Linear Properties - Integration by parts- Change of variable in a Riemann - Stieltjes integral - Reduction to a Riemann Integral - Euler's summation formula - Monotonically increasing integrators, Upper and lower integrals - Additive and linearity properties of upper and lower integrals - Riemann's condition.

Chapter - 7 : Sections 7.1 to 7.13

UNIT-III : THE RIEMANN-STIELTJES INTEGRAL

Integrators of bounded variation-Sufficient conditions for the existence of Riemann-Stieltjes integrals-Necessary conditions for the existence of Riemann-Stieltjes integrals-Mean value theorems for Riemann - Stieltjes integrals - The integrals as a function of the interval - Second fundamental theorem of integral calculus-Change of variable in a Riemann integral-Second Mean Value Theorem for Riemann integral-Riemann-Stieltjes integrals depending on a parameter-Differentiation under the integral sign.

Chapter - 7 : 7.15 to 7.25

UNIT-IV : INFINITE SERIES AND INFINITE PRODUCTS

Absolute and conditional convergence - Dirichlet's test and Abel's test - Rearrangement of series - Riemann's theorem on conditionally convergent series. Double sequences - Double series - Rearrangement theorem for double series - A sufficient condition for equality of iterated series - Multiplication of series - Cesaro summability - Infinite products.

Chapter 8 : Sections 8.8, 8.15, 8.17, 8.18, 8.20, 8.21 to 8.26

UNIT-V: SEQUENCES OF FUNCTIONS

Pointwise convergence of sequences of functions - Examples of sequences of real - valued functions - Definition of uniform convergence - Uniform convergence and continuity - The Cauchy condition for uniform convergence - Uniform convergence of infinite series of functions - Uniform convergence and Riemann - Stieltjes integration - Uniform convergence and differentiation - Sufficient condition for uniform convergence of a series - Mean convergence.

Chapter - 9 Sec 9.1 to 9.6, 9.8, 9.10, 9.11, 9.13

Recommended Text

Tom M. Apostol : *Mathematical Analysis*, 2nd Edition, Addison-Wesley Publishing Company Inc. New York, 1997.

Reference Books

1. Bartle, R.G. *Real Analysis*, John Wiley and Sons Inc., 1976.
2. Rudin, W. *Principles of Mathematical Analysis*, 3rd Edition. McGraw Hill Company, New York, 1976.
3. Malik, S.C. and Savita Arora. *Mathematical Analysis*, Wiley Eastern Limited. New Delhi, 1991.
4. Sanjay Arora and Bansi Lal, *Introduction to Real Analysis*, Satya Prakashan, New Delhi, 1991.
5. A.L. Gupta and N.R. Gupta, *Principles of Real Analysis*, Pearson Education, (Indian print) 2003.

PAPER - 3
ORDINARY DIFFERENTIAL EQUATIONS

Objectives : To develop strong background on finding solutions to linear differential equations with constant and variable coefficients and also with singular points, to study existence and uniqueness of the solutions of first order differential equations.

UNIT-I : LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS

Second order homogeneous equations-Initial value problems-Linear dependence and independence - Wronskian and a formula for Wronskian -Non-homogeneous equation of order two.

Chapter - 2 : Sections 1 to 6

UNIT-II : LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS

Homogeneous and non-homogeneous equation of order n - Initial value problems-Annihilator method to solve non-homogeneous equation - Algebra of constant coefficient operators.

Chapter - 2 : Sections 7 to 12.

UNIT-III : LINEAR EQUATION WITH VARIABLE COEFFICIENTS

Initial value problems - Existence and uniqueness theorems - Solutions to solve a non-homogeneous equation - Wronskian and linear dependence - reduction of the order of a homogeneous equation - homogeneous equation with analytic coefficients -The Legendre equation.

Chapter - 3 Sections 1 to 8

UNIT-IV : LINEAR EQUATION WITH REGULAR SINGULAR POINTS

Euler equation - Second order equations with regular singular points -Exceptional cases - Bessel Function.

Chapter 4 : Sections 1 to 4 and 6 to 8

UNIT-V: EXISTENCE AND UNIQUENESS OF SOLUTIONS TO FIRST ORDER EQUATIONS

Equation with variable separated - Exact equation - method of successive approximations - the Lipschitz condition - convergence of the successive approximations and the existence theorem.

Chapter 5 : Sections 1 to 6

Recommended Text

E.A.Coddington, *An introduction to ordinary differential equations* (3rd Reprint) Prentice-Hall of India Ltd., New Delhi, 1987.

Reference Books

1. Williams E. Boyce and Richard C. DI Prima, *Elementary differential equations and boundary value problems*, John Wiley and sons, New York, 1967.
2. George F Simmons, *Differential equations with applications and historical notes*, Tata McGraw Hill, New Delhi, 1974.
3. N.N. Lebedev, *Special functions and their applications*, Prentice Hall of India, New Delhi, 1965.
4. W.T. Reid. *Ordinary Differential Equations*, John Wiley and Sons, New York, 1971
5. M.D.Raisinghania, *Advanced Differential Equations*, S.Chand & Company Ltd. New Delhi 2001
6. B.Rai, D.P.Choudary and H.I. Freedman, *A Course in Ordinary Differential Equations*, Narosa Publishing House, New Delhi, 2002.

PAPER - 4
DIFFERENTIAL GEOMETRY

Objectives : This course introduces space curves and their intrinsic properties of a surface and geodesics. Further the non-intrinsic properties of surfaces are explored.

UNIT-I : SPACE CURVES

Definition of a space curve - Arc length - tangent - normal and binormal - curvature and torsion - contact between curves and surfaces - tangent surface - involutes and evolutes - Intrinsic equations - Fundamental Existence Theorem for space curves - Helics.

Chapter I : Sections 1 to 9

UNIT-II : INTRINSIC PROPERTIES OF A SURFACE

Definition of a surface - curves on a surface - Surface of revolution - Helicoids - Metric - Direction coefficients - families of curves - Isometric correspondence - Intrinsic properties.

Chapter II: Sections 1 to 9

UNIT-III : GEODESICS

Geodesics - Canonical geodesic equations - Normal property of geodesics - Existence Theorems - Geodesic parallels

Chapter II: Sections 10 to 14

UNIT-IV : GEODESICS (Contd . . .)

Geodesics curvature - Gauss - Bonnet Theorem - Gaussian curvature - surface of constant curvature.

Chapter II: Sections 15 to 18

UNIT-V : NON INTRINSIC PROPERTIES OF A SURFACE

The second fundamental form - Principal curvature - Lines of curvature - Developable - Developable associated with space curves and with curves on surface - Minimal surfaces - Ruled surfaces.

Chapter III: Sections 1 to 8

Recommended Text

T.J. Willmore, *An Introduction to Differential Geometry*, Oxford University Press, (17th Impression) New Delhi 2002. (Indian Print)

Reference Books

1. Struik, D.T. *Lectures on Classical Differential Geometry*, Addison - Wesley, Mass. 1950.
2. Kobayashi. S. and Nomizu. K. *Foundations of Differential Geometry*, Interscience Publishers, 1963.
3. Wilhelm Klingenberg: *A course in Differential Geometry*, Graduate Texts in Mathematics, Springer-Verlag 1978.
4. J.A. Thorpe *Elementary topics in Differential Geometry*, Under - graduate Texts in Mathematics, Springer - Verlag 1979.

ELECTIVE: PAPER - 1
(to choose any 1 out of the given 4)
A. FINITE ELEMENT METHOD

Objective: To give a basic expertise in the use of Finite Element Method Techniques.

Unit-I: SECOND ORDER DIFFERENTIAL EQUATIONS IN ONE DIMENSION

Finite element models Background – Basic steps of finite element analysis– Model boundary value problem–Discretization of the domain–Derivation of element equations–Connectivity of elements–Imposition of- boundary conditions–Solution of equations–Post computation of the solution–Some Remarks. (Numerical Example 3.2.1 only).

Chapter 3: Sections: 3.1 to 3.3

Unit – II: SECOND ORDER DIFFERENTIAL EQUATIONS IN ONE DIMENSION: APPLICATIONS

Axi-symmetric problems–Model equation–weak form–finite element model–preliminary comments–Discrete systems–Linear elastic spring– Torsion of circular shafts–Electrical resistor circuits –Fluid flow through pipes– Heat transfer – Governing equations –Finite element models – Fluid mechanics – Governing equations – Finite element model. (Numerical Examples 3.4.1, 4.2.1, 4.2.2, 4.3.1, 4.4.1 only)

Chapter 3: Section: 3.4 , Chapter 4: Sections: 4.1– 4.4.

Unit – III: SECOND ORDER DIFFERENTIAL EQUATIONS IN ONE DIMENSION: APPLICATIONS

Solid and Structural Mechanics–Preliminary Comments–Finite Element Model of Bars and cables – Plane trusses: Introduction – Basic truss element–General truss element – Constraint equations – Penalty approach – Direct approach. (Numerical Examples 4.6.1, 4.6.2, 4.6.5 only)

Chapter 4: Sections: 4.5 to 4.6

Unit-IV: BEAMS AND FRAMES

Introduction–Euler-Bernoulli beam element–Governing equation–Discretization of the domain – Derivation of element equations – Assembly of Element Equations – Imposition of boundary conditions– Post processing of solution – Timoshenko beam elements–Governing equations – Weak form–General finite element model.

Chapter 5: Sections: 5.1, 5.2 (5.2.1 to 5.2.6), 5.3 (5.3.1 to 5.3.3)

Unit–V: EIGEN VALUE AND TIME DEPENDENT PROBLEMS

Eigen value problems: Introduction – Formulation of Eigen value problems – Finite element formulation. Time dependent problems: Introduction–Semi discrete finite element models– Parabolic equations–Time Approximation (Numerical Example 6.1.1 only).

(Chapter 6: Sections: 6.1 (6.1.1 to 6.1.3), 6.2 (6.2.1 to 6.2.3))

Book for Study:

J.N.Reddy, An Introduction to the Finite Element Method (Third Edition)
Tata McGraw - Hill Publishing Company Limited, New Delhi, 2005.

Books for Reference

1. George R.Buchanan, Finite element analysis, Tata McGraw Hill company Limited, New Delhi, 2006.
2. David V.Hutton, Fundamentals of Finite element Analysis, Tata McGraw Hill company Limited, New Delhi, 2005.
3. Klaus Jurgen Bathe, Edward L. Wilson, Numerical methods in finite element Analysis, Prentice Hall of India private Limited, New Delhi, 1987.
4. C.S.Krishnamoorthy, Finite element Analysis Theory and Programming (Eighteenth Reprint), Tata McGraw Publishing company Limited, New Delhi, 2007.

ELECTIVE: PAPER - 1
B. DISCRETE MATHEMATICS

Objectives: This course aims to explore the topics like lattices and their applications in switching circuits, finite fields, polynomials and coding theory.

UNIT - I: LATTICES

Properties and examples of Lattices - Distributive lattices - Boolean algebras - Boolean polynomials - Minimal Forms of Boolean Polynomials.

Chapters: 1 to 4 and 6.

UNIT - II: APPLICATIONS OF LATTICES

Switching Circuits - Applications of Switching Circuits

Chapters: 7 and 8.

UNIT - III: FINITE FIELDS AND POLYNOMIALS

Finite fields

Chapter: 13.

UNIT - IV: FINITE FIELDS AND POLYNOMIALS

Irreducible Polynomials over Finite fields - Factorization of Polynomials over Finite fields.

Chapters: 14 and 15.

UNIT - V: CODING THEORY

Introduction to Coding - Linear Codes.

Chapters: 16 and 17.

Recommended Text

Rudolf Lidl & Gunter Pilz. APPLIED ABSTRACT ALGEBRA, Second Indian Reprint 2006, Springer Verlag, New York.

Reference Books

1. A.Gill, *Applied Algebra for Computer Science*, Prentice Hall Inc., New Jersey.
2. J.L.Gersting, *Mathematical Structures for Computer Science*(3rd Edn.), Computer Science Press, New York.
3. S.Wiitala, *Discrete Mathematics- A Unified Approach*, McGraw Hill Book Co.

ELECTIVE: PAPER - 1
C. GRAPH THEORY

Objectives : To study and develop the concepts of graphs, subgraphs, trees, connectivity, Euler tours, Hamilton cycles, matching, coloring of graphs, independent sets, cliques, vertex coloring, and planar graphs

UNIT-I : GRAPHS, SUBGRAPHS AND TREES

Graphs and simple graphs - Graph Isomorphism - The Incidence and Adjacency Matrices - Subgraphs - Vertex Degrees - Paths and Connection - Cycles - Trees - Cut Edges and Bonds - Cut Vertices.

Chapter 1 (Section 1.1 - 1.7) ; Chapter 2 (Section 2.1 - 2.3)

UNIT-II : CONNECTIVITY, EULER TOURS AND HAMILTON CYCLES

Connectivity - Blocks - Euler tours - Hamilton Cycles.

Chapter 3 (Section 3.1 - 3.2) ; Chapter 4 (Section 4.1 - 4.2)

UNIT-III : MATCHINGS, EDGE COLOURINGS

Matchings - Matchings and Coverings in Bipartite Graphs - Edge Chromatic Number - Vizing's Theorem.

Chapter 5 (Section 5.1 - 5.2) ; Chapter 6 (Section 6.1 - 6.2)

UNIT-IV : INDEPENDENT SETS AND CLIQUES, VERTEX COLOURINGS

Independent sets - Ramsey's Theorem - Chromatic Number - Brooks' Theorem - Chromatic Polynomials.

Chapter 7 (Section 7.1 – 7.2); Chapter 8 (Section 8.1 – 8.2, 8.4)

UNIT-V: PLANAR GRAPHS

Plane and planar Graphs - Dual graphs - Euler's Formula - The Five-Colour Theorem and the Four-Colour Conjecture.

Chapter 9 (Section 9.1 - 9.3, 9.6)

Recommended Text

J.A.Bondy and U.S.R. Murthy, *Graph Theory and Applications*, Macmillan, London, 1976.

Reference Books

1. J.Clark and D.A.Holton , *A First look at Graph Theory*, Allied Publishers, New Delhi, 1995.
2. R. Gould. *Graph Theory*, Benjamin/Cummings, Menlo Park, 1989.
3. A.Gibbons, *Algorithmic Graph Theory*, Cambridge University Press, Cambridge, 1989.
4. R.J.Wilson and J.J.Watkins, *Graphs : An Introductory Approach*, John Wiley and Sons, New York, 1989.
5. R.J. Wilson, *Introduction to Graph Theory*, Pearson Education, 4th Edition, 2004, Indian Print.
6. S.A.Choudum, *A First Course in Graph Theory*, MacMillan India Ltd. 1987.

ELECTIVE: PAPER - 1
D. RELIABILITY AND QUEUEING THEORY

Objectives : To study applications of Mathematics.

UNIT - I : RELIABILITY DEFINITION AND FAILURE DATA ANALYSIS

Introduction – Definition of Probability – Failure Data – Mean Failure Rate – Mean Time To Failure (MTTF) – Mean Time Between Failure (MTBF) – Graphical Plots.

Chapter-2: 2.1 - 2.2

Chapter-3: 3.2 - 3.6

UNIT - II : FAILURE DATA ANALYSIS

Four important points – MTTF in terms of Failure density – Generalization – Reliability in terms of Hazard rate and failure density – MTTF in integral form. Introduction – Definition of Probability – Failure Data – Mean Failure Rate – Mean Time To Failure – Mean Time Between Failure – Graphical Plots.

Chapter-3: 3.7 - 3.11

UNIT - III : SYSTEM RELIABILITY

Introduction – Series Configuration – Parallel Configuration – Mixed Configuration – Application to specific hazard Models – An r out of n structure – Systems not reducible to mixed configuration.

Chapter-6: 6.1 - 6.6 and 6.8

UNIT - IV : INTRODUCTION TO QUEUEING PROCESS

Measuring system performance – Some general results Simple data book keeping for queues - Poisson process and the exponential distribution – Markovian Property of the exponential distribution.

Chapter-1: 1.4 - 1.8

UNIT - V : SIMPLE MARKOVIAN BIRTH-DEATH QUEUEING MODELS

Steady state solution for the $M / M / 1$ model – Methods of solving steady state difference equations – Queues with parallel channels and truncation ($M / M / c / K$).

Recommended Text

1. Srinath. L. S., Reliability Engineering, East West Press, New Delhi. (for Units I , II and III)
2. Donald Gross, Carl M. Harris, Fundamentals of Queueing Theory, Wiley India. (for Units IV and V)

Reference Books

1. Cox. D. R. and H.D. Miller, Theory of Stochastic Processes, Methuen, London, 1965.
2. Cramer. H. and M. Leadbetter, Stationary and Related Stochastic Processes, Wiley, New York, 1966.
3. Karlin. S and H. Taylor, A First Course in Stochastic Processes, 2nd edition, Academic Press, New York, 1975.

SEMESTER - II

PAPER - 5

ALGEBRA - II

Objectives : To study field extension, roots of polynomials, Galois Theory, finite fields, division rings, solvability by radicals and to develop computational skill in abstract algebra.

UNIT-I

Extension fields - Transcendence of e .

Chapter 5: Section 5.1 and 5.2

UNIT-II

Roots of Polynomials.- More about roots

Chapter 5: Sections 5.3 and 5.5

UNIT-III

Elements of Galois theory.

Chapter 5 : Section 5.6

UNIT-IV

Solvability by Radicals - Finite fields - Wedderburn's theorem on finite division rings.

Chapter 5: Section 5.7.

Chapter 7: Sections 7.1 and 7.2 (Only Theorem 7.2.1)

UNIT-V

Solvability by radicals - A theorem of Frobenius - Integral Quaternions and the Four - Square theorem.

Chapter 7 : Sections 7.3 and 7.4

Recommended Text

I.N. Herstein. *Topics in Algebra* (II Edition) Wiley Eastern Limited, New Delhi, 1975.

Reference Books

1. M.Artin, *Algebra*, Prentice Hall of India, 1991.
2. B.Bhattacharya, S.K.Jain, and S.R.Nagpaul, *Basic Abstract Algebra* (II Edition) Cambridge University Press, 1997. (Indian Edition)
3. I.S.Luther and I.B.S.Passi, *Algebra*, Vol. I - Groups (1996); Vol. II *Rings*, Narosa Publishing House , New Delhi, 1999
4. D.S.Malik, J.N. Mordeson and M.K.Sen, *Fundamental of Abstract Algebra*, McGraw Hill (International Edition), New York. 1997.
5. N.Jacobson, *Basic Algebra*, Vol. I & II Hindustan Publishing Company, New Delhi.

PAPER - 6
REAL ANALYSIS II

Objectives : To introduce measure on the real line, Lebesgue measurability and integrability, Fourier Series and Integrals, in-depth study in multivariable calculus.

UNIT - I : FOURIER SERIES AND FOURIER INTEGRALS

Introduction - Orthogonal system of functions - The theorem on best approximation - The Fourier series of a function relative to an orthonormal system - Properties of Fourier Coefficients - The Riesz-Fischer Theorem - The convergence and representation problems in trigonometric series - The Riemann - Lebesgue Lemma - The Dirichlet Integrals - An integral representation for the partial sums of Fourier series - Riemann's localization theorem - Sufficient conditions for convergence of a Fourier series at a particular point - Cesaro summability of Fourier series- Consequences of Fejes's theorem - The Weierstrass approximation theorem

Chapter 11 : Sections 11.1 to 11.15 (Apostol)

UNIT - II : MULTIVARIABLE DIFFERENTIAL CALCULUS

Introduction - The Directional derivative - Directional derivative and continuity - The total derivative - The total derivative expressed in terms of partial derivatives - The matrix of linear function - The Jacobian matrix - The chain rule - Matrix form of chain rule - The mean - value theorem for differentiable functions - A sufficient condition for differentiability - A sufficient condition for equality of mixed partial derivatives - Taylor's theorem for functions of \mathbb{R}^n to \mathbb{R}^1

Chapter 12 : Section 12.1 to 12.14 (Apostol)

UNIT - III : IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS

Functions with non-zero Jacobian determinants - The inverse function theorem -The Implicit function theorem - Extrema of real valued functions of severable variables - Extremum problems with side conditions.

Chapter 13 : Sections 13.1 to 13.7 (Apostol)

UNIT - IV THE LEBESGUE INTEGRAL

Length of open sets and closed sets - Inner and outer measure : Measurable sets - Properties of measurable sets - Measurable functions - Definition and existence of the Lebesgue integral for bounded function.

Chapter 11 : Section 11.1 to 11.5 [R. R. Goldberg]

UNIT - V THE LEBESGUE INTEGRAL (Contd . . .)

Properties of the Lebesgue integral for bounded measurable functions - The Lebesgue integral for unbounded functions - Some fundamental theorems - The metric space $L^2[a, b]$ - The integral on $(-\infty, \infty)$ and int plane.

Chapter 11 : Section 11.6 to 11.10 [R. R. Goldberg]

Recommended Texts

1. Tom M. Apostol : *Mathematical Analysis*, 2nd Edition, Addison-Wesley Publishing Company Inc. New York, 1974. (for Units I, II and III)
2. Richard R. Goldberg, *Methods of Real Analysis*, Oxford & IBH Publishing, New Delhi, 1975. (for Unit IV and V)

Reference Books

1. Burkill, J.C. *The Lebesgue Integral*, Cambridge University Press, 1951.
2. Munroe, M.E. *Measure and Integration*. Addison-Wesley, Mass. 1971.
3. Roydon, H.L. *Real Analysis*, Macmillan Pub. Company, New York, 1988.
4. Rudin, W. *Principles of Mathematical Analysis*, McGraw Hill Company, New York, 1979.
5. Malik, S.C. and Savita Arora. *Mathematical Analysis*, Wiley Eastern Limited. New Delhi, 1991.
6. Sanjay Arora and Bansilal, *Introduction to Real Analysis*, Satya Prakashan, New Delhi, 1991

PAPER - 7

PARTIAL DIFFERENTIAL EQUATIONS

Objectives : The aim of the course is to introduce to the students the various types of partial differential equations and how to solve these equations.

UNIT - I : PARTIAL DIFFERENTIAL EQUATIONS OF FIRST ORDER

Formation and solution of PDE- Integral surfaces - Cauchy Problem order equation - Orthogonal surfaces - First order non-linear - Characteristics - Compatible system - Charpits method.

Chapter 0: 0.4 to 0.11 (omit 0.1, 0.2, 0.3 and 0.11.1)

UNIT - II : FUNDAMENTALS

Introduction – Classification of Second Order PDE - Canonical forms – Adjoint Operators - Riemann's method.

Chapter 1 : 1.1 to 1.5

UNIT - III : ELLIPTIC DIFFERENTIAL EQUATIONS

Derivation of Laplace and Poisson equation - BVP - Separation of Variables - Dirichlet's Problem and Neumann Problem for a rectangle - Solution of Laplace equation in Cylindrical and spherical coordinates - Examples.

Chapter 2 : 2.1, 2.2, 2.5 to 2.7, 2.11, 2.12 (omit 2.3, 2.4, 2.8, 2.9, 2.10 and 2.13)

UNIT - IV : PARABOLIC DIFFERENTIAL EQUATIONS

Formation and solution of Diffusion equation - Dirac-Delta function - Separation of variables method - Solution of Diffusion Equation in Cylindrical and spherical coordinates - Examples.

Chapter 3 : 3.1 to 3.7.

UNIT - V : HYPERBOLIC DIFFERENTIAL EQUATIONS

Formation and solution of one-dimensional wave equation - canonical reduction – IVP - D'Alembert's solution - IVP and BVP for two-dimensional wave equation - Periodic solution of one-dimensional wave equation in cylindrical and spherical coordinate systems - Uniqueness of the solution for the wave equation - Duhamel's Principle - Examples.

Chapter 4: 4.1 to 4.12 (omit 4.5, 4.6 & 4.10)

Recommended Text

K. Sankar Rao, *Introduction to Partial Differential Equations*, 2nd Edition, Prentice Hall of India, New Delhi. 2005

Reference Books

1. R.C.McOwen, *Partial Differential Equations*, 2nd Edn. Pearson Education, New Delhi, 2005.
2. I.N.Sneddon, *Elements of Partial Differential Equations*, McGraw Hill, New Delhi, 1983.
3. R. Dennemeyer, *Introduction to Partial Differential Equations and Boundary Value Problems*, McGraw Hill, New York, 1968.
4. M.D.Raisinghania, *Advanced Differential Equations*, S.Chand & Company Ltd., New Delhi, 2001.

**PAPER - 8
MECHANICS**

Objectives : To study mechanical systems under generalized coordinate systems, virtual work, energy and momentum, to study mechanics developed by Newton, Lagrange, Hamilton Jacobi and Theory of Relativity due to Einstein.

UNIT-I : MECHANICAL SYSTEMS

The Mechanical system - Generalised coordinates - Constraints - Virtual work - Energy and Momentum.

Chapter 1 : Sections 1.1 to 1.5

UNIT-II : LAGRANGE'S EQUATIONS

Derivation of Lagrange's equations- Examples - Integrals of motion.

Chapter 2 : Sections 2.1 to 2.3 (Omit Section 2.4)

UNIT-III : HAMILTON'S EQUATIONS

Hamilton's Principle - Hamilton's Equation - Other variational principle.

Chapter 4 : Sections 4.1 to 4.3 (Omit section 4.4)

UNIT-IV : HAMILTON-JACOBI THEORY

Hamilton Principle function - Hamilton-Jacobi Equation - Separability

Chapter 5 : Sections 5.1 to 5.3

UNIT-V : CANONICAL TRANSFORMATION

Differential forms and generating functions - Special Transformations - Lagrange and Poisson brackets.

Chapter 6 : Sections 6.1, 6.2 and 6.3 (omit sections 6.4, 6.5 and 6.6)

Recommended Text

D. T. Greenwood, *Classical Dynamics*, Prentice Hall of India, New Delhi, 1985.

Reference Books

1. H. Goldstein, *Classical Mechanics*, (2nd Edition) Narosa Publishing House, New Delhi.
2. N.C.Rane and P.S.C.Joag, *Classical Mechanics*, Tata McGraw Hill, 1991.
3. J.L.Synge and B.A.Griffith, *Principles of Mechanics* (3rd Edition) McGraw Hill Book Co., New York, 1970.

**HUMAN RIGHTS
COMPULSORY PAPER**

UNIT – I

Definition of Human Rights – Nature, Content, Legitimacy and Priority – Theories of Human Rights – Historical Development of Human Rights.

UNIT – II

International Human Rights – Prescription and Enforcement upto World War II – Human Rights and the U. N. O. – Universal Declaration of Human Rights – International Covenant on Civil and Political Rights – International Covenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT – III

Human Rights Declarations – U.N. Human Rights Declarations – U.N. Human Rights Commissioner.

UNIT – IV

Amnesty International – Human Rights and Helsinki Process – Regional Developments – European Human Rights System – African Human Rights System – International Human Rights in Domestic courts.

UNIT – V

Contemporary Issues on Human Rights: Children's Rights – Women's Rights – Dalit's Rights – Bonded Labour and Wages – Refugees – Capital Punishment.
Fundamental Rights in the Indian Constitution – Directive Principles of State Policy – Fundamental Duties – National Human Rights Commission.

Reference Magazines:

1. The Lawyer, Bombay.
2. Human Rights Today, Columbia University.
3. International Instruments of Human Rights, UN Publication.
4. Human Rights Quarterly, John Hopkins University, U.S.A.

Books for Reference:

1. International Bill of Human Rights, Amnesty International Publication, 1988.
2. Human Rights, Questions and Answers, UNESCO, 1982.
3. Mausice Cranston - What is Human Rights.
4. Desai, A.R - Violation of Democratic Rights in India.
5. Pandey - Constitutional Law.
6. Timm R.W - Working for Justice and Human Rights.
7. Human Rights - A Selected Bibliography, USIS.
8. J.C. Johari - Human Rights and New World order.
9. G.S. Bajwa - Human Rights in India.
10. Amnesty International - Human Rights in India.
11. P.C. Sinha & K. Cheous (Ed) - International Encyclopedia of Peace, Security,
Social Justice and Human Rights (Vols. 1 - 7).
12. Devasia, V.V - Human Rights and Victimology.

ELECTIVE: PAPER-2

(to choose any 1 out of the given 4)

A. PROGRAMMING IN C++ PRACTICALS

Objectives: This course introduces a higher level language C++ and numerical methods for hands-on experience on computers. Stress is also given on the error analysis.

- ❖ Functions in C++ - Classes and Objects.
- ❖ Constructors and destructors - Operator Overloading
- ❖ Inheritance : Pointers and Polymorphism.

Recommended Text

Balagurusamy, *Object Oriented Programming with C++*, Tata McGraw Hill, New Delhi, 1999.

Reference Books

D. Ravichandran, *Programming with C++*, Tata McGraw Hill, New Delhi, 1996.

COMPUTER LABORATORY PRACTICE EXERCISES

COMPUTER LANGUAGE EXERCISES FOR PROGRAMMING IN C++

1. Write a class to represent a vector (a series of float values). Include member functions to perform the following tasks: To create the vector, To modify the value of a given element, To multiply by a scalar value, To display the vector in the form (10, 20, 30,...). Write a program to test your class.
2. Create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.
3. Write a program which shows the days from the start of year to date specified. Hold the number of days for each month in an array. Allow the user to enter the month and the day of the year. Then the program should display the total days till the day.
4. Write a program to include all possible binary operator overloading using friend function.
5. Write a program to read an array of integer numbers and sort it in descending order. Use readdata, putdata, and arraymax as member functions in a class.
6. Write a program to read two character strings and use the overloaded '+' operator to append the second string to the first.
7. Develop a program Railway Reservation System using Hybrid Inheritance and Virtual Function.
8. Using overloaded constructor in a class write a program to add two complex numbers.
9. Create a class MAT of size(m,n). Define all possible matrix operations for MAT type objects.
10. Write a program that determines whether a given number is a prime number or not and then prints the result using polymorphism.
11. Write a program to illustrate the dynamic initialization of constructors.
12. Write a program to illustrate the use of pointers to objects.
13. Write a program to illustrate how to construct a matrix of size m x n .
14. Write a program to arrange the given data in ascending / descending order using various sorting algorithms
15. Write a program to find the biggest /smallest number in the given data using various search algorithms

ELECTIVE: PAPER-2
B. FUZZY MATHEMATICS

Objectives : To introduce the basic notions and study the techniques of Fuzzy Mathematics.

UNIT - I : FUZZY SETS

Fuzzy sets – Basic Types – Basic concepts – Characteristics – Significance of the paradigm shift – Additional properties of α – cuts.

Chapter 1 : Sections 1.3 to 1.5 and Chapter 2 : Section 2.1

UNIT - II : FUZZY SETS VERSUS CRISP SETS

Representation of Fuzzy sets – Extension principle of Fuzzy sets – Operation on Fuzzy sets – Types of operation – Fuzzy complements.

Chapter 2 : Sections 2.2 and 2.3 and Chapter 3 : Sections 3.1 and 3.2

UNIT - III : OPERATIONS ON FUZZY SETS

Fuzzy intersection – t-norms – Fuzzy unions – t-conorms.

Chapter 3 : Sections 3.3 and 3.4.

UNIT - IV : FUZZY ARITHMETIC

Fuzzy number – Linguistic variables – Arithmetic operation on intervals – Lattice of Fuzzy numbers.

Chapter 4 : Sections 4.1 to 4.4

UNIT - V : FUZZY RELATIONS

Crisp Versus fuzzy relations – Projection and Cylindric extension – binary fuzzy relations – binary relations on a single set.

Chapter 5 : Sections 5.1 to 5.4

Recommended Text

G. J. Klir and Bo Yuan, *Fuzzy Sets and Fuzzy Logic : Theory and Applications*, PHI, New Delhi, 2005.

Reference Books

1. H. J. Zimmerman, *Fuzzy Set Theory and its Applications*, Allied Publishers, 1996.
2. A. Kaufman, *Introduction to the theory of Fuzzy Subsets*, Academic Press, 1975.
3. V. Novak, *Fuzzy Sets and their Applications*, Adam Hilger, Bristol, 1969.

ELECTIVE: PAPER-2

C. CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS

Objectives : The aim of the course is to introduce to the students the concept of calculus of variation and its applications and second to introduce various types of integral equations and how to solve these equations.

UNIT-I : VARIATIONAL PROBLEMS WITH MOVING BUNDARIES

The concept of Variation and its properties – Euler’s equation – Variational problems for functional – Functionals dependent on higher order derivatives – Functions of several independent variables – Some applications to problems of mechanics.

Chapter 1 : 1.1 to 1.7

UNIT - II : VARIATIONAL PROBLEMS WITH MOVING BOUNDARIES

Movable boundary for a functional dependent on two functions – One sided variations – Reflection and Refraction of extremals – Diffraction of light rays.

Chapter 2 : 2.1 to 2.5

UNIT - III INTEGRAL EQUATIONS

Introduction – Definition – Regularity conditions – Special kinds of Kernals – Eigen values and eigen functions – Convolution integral – Reduction to a system of algebraic equations – Examples – Fredholm alternative – Examples – An approximation method.

Chapter 1 : 1.1 to 1.5

Chapter 2 : 2.1 to 2.5

UNIT - IV METHOD OF SUCCESSIVE APPROXIMATIONS AND FREDHOLM THEORY

Method of successive approximations – Iterative scheme – Examples – Volterra integral equations – Examples – Some results about the resolvent kernel – The method of solution of Fredholm equation – Fredholm first theorem – Examples.

Chapter 3 : 3.1 to 3.5

Chapter 4 : 4.1 to 4.3

UNIT - V APPLICATIONS TO ORDINARY DIFFERENTIAL EQUATIONS

Initial value problems – Boundary value problems – Examples – Singular integral equations – The Abel integral equations - Examples.

Chapter 5 : 5.1 to 5.3

Chapter 8 : 8.1 to 8.2

Recommended Text

1. A. S. Gupta, *Calculus of Variations with Applications*, PHI, New Delhi, 2005. (for Units I and II)
2. Ram P. Kanwal, *Linear Integral Equations*, Theory and Techniques, Academic Press, New York, 1971. (for Units III, IV and V)

Reference Books

1. M. D. Raisinghania, *Integral Equations and Boundary Value Problems*, S. Chand & Co., New Delhi, 2007.
2. Sudir K. Pundir and Rimple Pundir, *Integral Equations and Boundary Value Problems*, Pragati Prakasam, Meerut. 2005.

ELECTIVE: PAPER-2
D. MATHEMATICAL MODELLING

Objective of the course:

This course aims at introducing mathematical modeling through differential equations, systems of ordinary differential equations, difference equations, graphs, calculus of variations and dynamical programming.

Unit – I: MATHEMATICAL MODELLING THROUGH SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS OF THE FIRST ORDER

Mathematical modelling in Population Dynamics – Mathematical Modelling of Epidemics Through Systems of Ordinary Differential Equations of First Order– Mathematical Models in Medicine, Arms Race, Battles and International Trade in Terms of Systems of Ordinary Differential Equations – Mathematical Modelling in Dynamics Through Systems of Ordinary Differential Equations of First Order.
(Chapter 3:3.1, 3.2, 3.5, 3.6)

Unit – II: MATHEMATICAL MODELLING THROUGH DIFFERENCE EQUATIONS

The Need for Mathematical Modelling Through Difference Equations: Some Simple Models – Basic Theory of Linear Difference Equations with Constant Coefficients – Mathematical Modelling Through Difference Equations in Economics and Finance.
(Chapter 5: 5.1 – 5.3)

Unit – III: MATHEMATICAL MODELLING THROUGH DIFFERENCE EQUATIONS

Mathematical Modelling Through Difference Equations in Population Dynamics and Genetics – Mathematical Modelling Through Difference Equations in Probability Theory –Miscellaneous Examples of Mathematical Modelling Through Difference Equations.
(Chapter 5: 5.4 – 5.6)

Unit – IV: MATHEMATICAL MODELLING THROUGH GRAPHS

Situations that can be Modelled Through Graphs – Mathematical Models in Terms of Directed Graphs – Mathematical Models in Terms of Signed Graphs – Mathematical Modelling in Terms of Weighted Digraphs.
(Chapter 7: 7.1 – 7.4)

Unit – V: MATHEMATICAL MODELLING THROUGH CALCULUS OF VARIATIONS AND DYNAMIC PROGRAMMING

Optimization Principles and Techniques – Mathematical Modelling Through Calculus of Variations – Mathematical Modelling Through Dynamic Programming.

(Chapter 9: 9.1 – 9.3)

Recommended Text:

J.N. Kapur, Mathematical Modelling, Wiley Eastern Limited, Reprint 2000.

Reference Books:

1. **D.J. G. James** and **J.J. Macdonald**, Case studies in Mathematical modelling, Stanley Thames, Cheltenham.
2. **J.N. Kapur**, Maximum entropy models.
3. **M. Cross** and **AO. Moscardini**, The Art of Mathematical Modelling, Ellis Harwood and John Wiley.
4. **C. Dyson, Elvery**, Principles of Mathematical Modelling, Academic Press, New York.
5. **D.N. Burghes**, Modelling with Difference Equations, Ellis Harwood and John Wiley.

**SEMESTER - III
PAPER - 9
COMPLEX ANALYSIS - I**

Objectives : To Study Cauchy integral formula, local properties of analytic functions, general form of Cauchy's theorem and evaluation of definite integral and harmonic functions

UNIT-I : ANALYTIC FUNCTIONS AS MAPPINGS

Analytic functions in regions- conformal mapping-Fundamental Theorems: Line integrals-Rectifiable arcs-line integrals as functions of arcs-Cauchy's theorem for a rectangle- Cauchy's theorem in a disk.

Chapter 3: Section 2 : 2.2 and 2.3;

Chapter 4 : Section 1 : 1.1 to 1.5;

UNIT-II : CAUCHY'S INTEGRAL FORMULA

The Index of a point with respect to a closed curve - The Integral formula - Higher derivatives. Local Properties of Analytic Functions: Removable Singularities - Taylor's Theorem - Zeros and poles - The local Mapping - The Maximum Principle.

Chapter 4 : Section 2 : 2.1 to 2.3;

Chapter 4 : Section 3 : 3.1 to 3.4

UNIT-III : THE GENERAL FORM OF CAUCHY'S THEOREM

Chains and cycles- Simple Continuity - Homology - The General statement of Cauchy's Theorem - Proof of Cauchy's theorem - Locally exact differentials- Multiply connected regions - Residue theorem - The argument principle.

Chapter 4 : Section 4 : 4.1 to 4.7;

Chapter 4 : Section 5: 5.1 and 5.2

UNIT-IV : EVALUATION OF DEFINITE INTEGRALS AND HARMONIC FUNCTIONS

Evaluation of definite integrals - Definition of Harmonic function and basic properties - Mean value property - Poisson formula.

Chapter 4 : Section 5 : 5.3 ;

Chapter 4 : Sections 6 : 6.1 to 6.3

UNIT-V : HARMONIC FUNCTIONS AND POWER SERIES EXPANSIONS

Schwarz theorem - The reflection principle - Weierstrass theorem - Taylor's Series - Laurent series .

Chapter 4 : Sections 6.4 and 6.5 ; Chapter 5 : Sections 1.1 to 1.3

Recommended Text

- ❖ Lars V. Ahlfors, Complex Analysis, (3rd edition) McGraw Hill Co., New York, 1979

Reference Books

1. H.A. Presfly, Introduction to complex Analysis, Clarendon Press, oxford, 1990.
2. J.B. Conway, Functions of one complex variables Springer - Verlag, International student Edition, Naroser Publishing Co.1978
3. E. Hille, Analytic function Thorey (2 vols.), Gonm & Co, 1959.
4. M.Heins, Complex function Theory, Academic Press, New York,1968.

**PAPER - 10
TOPOLOGY**

Objectives : To study topological spaces, continuous functions, connectedness, compactness, countability and separation axioms.

UNIT-I : TOPOLOGICAL SPACES

Topological spaces - Basis for a topology - The order topology - The product topology on $X \times Y$ - The subspace topology - Closed sets and limit points.

Chapter 2 : Sections 12 to 17

UNIT-II : CONTINUOUS FUNCTIONS

Continuous functions - the product topology - The metric topology.

Chapter 2 : Sections 18 to 21 (Omit Section 22)

UNIT-III : CONNECTEDNESS

Connected spaces - connected subspaces of the Real line - Components and local connectedness.

Chapter 3 : Sections 23 to 25

UNIT-IV : COMPACTNESS

Compact spaces - compact subspaces of the Real line - Limit Point Compactness - Local Compactness.

Chapter 3 : Sections 26 to 29

UNIT-V: COUNTABILITY AND SEPARATION AXIOM

The Countability Axioms - The separation Axioms - Normal spaces - The Urysohn Lemma - The Urysohn metrization Theorem - The Tietz extension theorem.

Chapter 4 : Sections 30 to 35

Recommended Text

James R. Munkres, *Topology* (2nd Edition) Pearson Education Pve. Ltd., Delhi-2002 (Third Indian Reprint)

Reference Books

1. J. Dugundji , *Topology* , Prentice Hall of India, New Delhi, 1975.
2. George F.Sinmons, *Introduction to Topology and Modern Analysis*, McGraw Hill Book Co., 1963
3. J.L. Kelly, *General Topology*, Van Nostrand, Reinhold Co., New York
4. L.Steen and J.Subhash, *Counter Examples in Topology*, Holt, Rinehart and Winston, New York, 1970.
5. S.Willard, *General Topology*, Addison - Wesley, Mass., 1970

PAPER - 11
OPERATIONS RESEARCH

Objectives: This course aims to introduce decision theory, PERT, CPM, deterministic and probabilistic inventory systems, queues, replacement and maintenance problems.

UNIT – I: INTEGER LINEAR PROGRAMMING

Types of Integer Linear Programming Problems - Concept of Cutting Plane - Gomory's All Integer Cutting Plane Method - Gomory's mixed Integer Cutting Plane method - Branch and Bound Method.

Chapter-7: 7.1 - 7.6

UNIT – II: DYNAMIC PROGRAMMING

Characteristics of Dynamic Programming Problem - Developing Optimal Decision Policy - Dynamic Programming Under Certainty - DP approach to solve LPP.

Chapter-20: 20.1 - 20.5

UNIT - III:

CLASSICAL OPTIMIZATION METHODS : Unconstrained Optimization - Constrained Multi-variable Optimization with Equality Constraints - Constrained Multi-variable Optimization with inequality Constraints.

NON-LINEAR PROGRAMMING METHODS: Examples of NLPP - General NLPP - Graphical solution - Quadratic Programming - Wolfe's modified Simplex Methods.

Chapter-23: 23.1 - 23.4 and Chapter-24: 24.1 - 24.4

UNIT-IV

REVISED SIMPLEX METHOD : Standard forms for Revised simplex Method - Computational procedure for Standard form I - comparison of simplex method and Revised simplex Method.

BOUNDED VARIABLES LP PROBLEM: The simplex algorithm

Chapter-26: 26.1 - 26.4

Chapter-28: 28.1, 28.2

UNIT-V : DECISION THEORY

Steps in Decision theory Approach - Types of Decision-Making Environments - Decision Making Under Uncertainty - Decision Making under Risk - Posterior Probabilities and Bayesian Analysis - Decision Tree Analysis - Decision Making with Utilities.

Chapter-11 : 11.1 - 11.8

Recommended Text

J. K. Sharma, *Operations Research*, Theory and Applications, Third Edition (2007) Macmillan India Ltd.

Reference Books

1. Hamdy A. Taha, *Operations Research*, (seventh edition) Prentice - Hall of India Private Limited, New Delhi, 1997.
2. F.S. Hillier & J.Lieberman *Introduction to Operation Research* (7th Edition) Tata-McGraw Hill company, New Delhi, 2001.
3. Beightler. C, D.Phillips, B. Wilde ,*Foundations of Optimization* (2nd Edition) Prentice Hall Pvt Ltd., New York, 1979
4. S.S. Rao - *Optimization Theory and Applications*, Wiley Eastern Ltd. New Delhi. 1990

PAPER - 12
PROBABILITY THEORY

Objectives : To introduce axiomatic approach to probability theory, to study some statistical characteristics, discrete and continuous distribution functions and their properties, characteristic function and basic limit theorems of probability.

UNIT-I : RANDOM EVENTS AND RANDOM VARIABLES

Random events - Probability axioms - Combinatorial formulae - conditional probability - Bayes Theorem - Independent events - Random Variables - Distribution Function - Joint Distribution - Marginal Distribution - Conditional Distribution - Independent random variables - Functions of random variables.

Chapter 1: Sections 1.1 to 1.7

Chapter 2 : Sections 2.1 to 2.9

UNIT-II : PARAMETERS OF THE DISTRIBUTION

Expectation- Moments - The Chebyshev Inequality - Absolute moments - Order parameters - Moments of random vectors - Regression of the first and second types.

Chapter 3 : Sections 3.1 to 3.8

UNIT-III: CHARACTERISTIC FUNCTIONS

Properties of characteristic functions - Characteristic functions and moments - semi-invariants - characteristic function of the sum of the independent random variables - Determination of distribution function by the Characteristic function - Characteristic function of multidimensional random vectors - Probability generating functions.

Chapter 4 : Sections 4.1 to 4.7

UNIT-IV : SOME PROBABILITY DISTRIBUTIONS

One point , two point , Binomial - Polya - Hypergeometric - Poisson (discrete) distributions - Uniform - normal gamma - Beta - Cauchy and Laplace (continuous) distributions.

Chapter 5 : Section 5.1 to 5.10

UNIT - V: LIMIT THEOREMS

Stochastic convergence - Bernoulli law of large numbers - Convergence of sequence of distribution functions - Levy-Cramer Theorems - de Moivre-Laplace Theorem - Lindberg Theorem - Lyapunov Theroem.

Chapter 6 : Sections 6.1 to 6.4, 6.6 to 6.9.

Recommended Text

M. Fisz, Probability Theory and Mathematical Statistics, John Wiley and Sons, New York, 1963.

Reference Books

1. R.B. Ash, Real Analysis and Probability, Academic Press, New York, 1972
2. K.L.Chung, A course in Probability, Academic Press, New York, 1974.
3. R.Durrett, Probability : Theory and Examples, (2nd Edition) Duxbury Press, New York, 1996.
4. V.K.Rohatgi An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi, 1988(3rd Print).
5. S.I.Resnick, A Probability Path, Birhauser, Berlin,1999.
6. B. R. Bhat, Modern Probability Theory (3rd Edition), New Age International (P)Ltd, New Delhi, 1999

ELECTIVE: PAPER - 3

(to choose any 1 out of the given 4)

A. TENSOR ANALYSIS AND RELATIVITY THEORY

Objectives : The course aims to introduce vector algebra and vector calculus and special relativity and relativistic kinematics, dynamics and accelerated systems.

UNIT-I : TENSOR ALGEBRA

Systems of Different orders - Summation Convention - Kronecker Symbols - Transformation of coordinates in S_n - Invariants - Covariant and Contravariant vectors - Tensors of Second Order - Mixed Tensors - Zero Tensor - Tensor Field - Algebra of Tensors - Equality of Tensors - Symmetric and Skew –symmetric tensors - Outer multiplication, Contraction and Inner Multiplication - Quotient Law of Tensors - Reciprocal Tensor of Tensor - Relative Tensor - Cross Product of Vectors.

Chapter I : I.1 - I.3, I.7 and I.8 and Chapter II : II.1 - II.19

UNIT-II : TENSOR CALCULUS

Riemannian Space - Christoffel Symbols and their properties

Chapter III: III.1 and III.2

UNIT-III : TENSOR CALCULUS (Contd . . .)

Covariant Differentiation of Tensors - Riemann - Christoffel Curvature Tensor - Intrinsic Differentiation.

Chapter III: III.3 - III.5

UNIT-IV : SPECIAL THEORY OF RELATIVITY

Galilean Transformation - Maxwell's equations - The ether Theory - The Principle of Relativity.

Relativistic Kinematics : Lorentz Transformation equations - Events and simultaneity - Example - Einstein Train - Time dilation - Longitudinal Contraction - Invariant Interval - Proper time and Proper distance - World line - Example - twin paradox - addition of velocities - Relativistic Doppler effect.

Chapter 7 : Sections 7.1 and 7.2

UNIT-V : RELATIVISTIC DYNAMICS

Momentum - Energy - Momentum - energy four vector - Force - Conservation of Energy - Mass and energy - Example - inelastic collision - Principle of equivalence - Lagrangian and Hamiltonian formulations.

Accelerated Systems : Rocket with constant acceleration - example - Rocket with constant thrust

Chapter 7 : Sections 7.3 and 7.4

Recommended Texts

1. U.C. De, Absos Ali Shaikh and Joydeep Sengupta, *Tensor Calculus*, Narosa Publishing House, New Delhi, 2004. **(For Units I,II and III)**
2. D. Greenwood, *Classical Dynamics*, Prentice Hall of India, New Delhi, 1985. **(For Units IV and V)**

Reference Books

1. J.L.Synge and A.Schild, *Tensor Calculus*, Toronto, 1949.
2. A.S.Eddington. *The Mathematical Theory of Relativity*, Cambridge University Press, 1930.
3. P.G.Bergman, *An Introduction to Theory of Relativity*, New York, 1942
4. C.E.Weatherburn, *Riemannian Geometry and the Tensor Calculus*, Cambridge, 1938.

ELECTIVE: PAPER - 3
B. ANALYTIC NUMBER THEORY

Objectives : This course introduces arithmetic function and Dirichlet multiplication, averages of arithmetic function, congruence and quadratic residues

UNIT-I

Arithmetical function and Dirichlet multiplication.

Chapter 2

UNIT-II

Averages of Arithmetical function.

Chapter 3

UNIT-III

Congruence - Finite Abelian Groups and their characters

Chapter 5 (Omit 5.10 and 5.11) ; Chapter 6: 6.1 to 6.4

UNIT-IV

Finite Abelian Groups and their characters (contd. . .) - Dirichlet's theorem on Primes in Arithmetic Progressions

Chapter 6: 6.5 to 6.10; Chapter 7: All sections except 7.9

UNIT-V

Quadratic residues and quadratic reciprocity law.

Chapter 9 (Omit 9.10 and 9.11)

Recommended Text

Tom Apostol, *Introduction to Analytic Number theory*, Narosa Publications, New Delhi,

Reference Books

1. I. Niven and Zuckermann H.S. : *An Introduction to the theory of numbers*, Wiley Eastern Ltd. 1972
2. C.Y. Hsiung : *Elementary Theory of Numbers*, Allied Publishers.
3. W.W. Adams and L. J. Goldstein, *Introduction to Number Theory*, Prentice Hall Inc.
4. S.G. Telang, *Number Theory*.

ELECTIVE: PAPER - 3
C. FLUID DYNAMICS

Objectives : This course aims to discuss kinematics of fluids in motion, Equations of motion of a fluid, three dimensional flows, two dimensional flows and viscous flows.

UNIT-I

Kinematics of Fluids in motion. Real fluids and Ideal fluids - Velocity of a fluid at a point, Stream lines , path lines , steady and unsteady flows- Velocity potential - The vorticity vector- Local and particle rates of changes - Equations of continuity - Worked examples - Acceleration of a fluid - Conditions at a rigid boundary.

Chapter 2. Sections 2.1 to 2.10.

UNIT-II: EQUATIONS OF MOTION OF A FLUID

Pressure at a point in a fluid at rest. - Pressure at a point in a moving fluid - Conditions at a boundary of two inviscid immiscible fluids- Euler's equation of motion - Discussion of the case of steady motion under conservative body forces.

Chapter 3. Sections 3.1 to 3.7

UNIT-III

Some three dimensional flows. Introduction- Sources, sinks and doublets - Images in a rigid infinite plane - Axis symmetric flows - stokes stream function

Chapter 4 Sections 4.1, 4.2, 4.3, 4.5.

UNIT-IV : SOME TWO DIMENSIONAL FLOWS

Meaning of two dimensional flow - Use of Cylindrical polar coordinate - The stream function - The complex potential for two dimensional, irrotational incompressible flow - Complex velocity potentials for standard two dimensional flows - Some worked examples - Two dimensional Image systems - The Milne Thompson circle Theorem.

Chapter 5. Sections 5.1 to 5.8

UNIT-V : VISCOUS FLOWS

Stress components in a real fluid. - Relations between Cartesian components of stress-
Translational motion of fluid elements - The rate of strain quadric and principal stresses -
Some further properties of the rate of strain quadric - Stress analysis in fluid motion -
Relation between stress and rate of strain - The coefficient of viscosity and Laminar flow
- The Navier - Stokes equations of motion of a Viscous fluid.

Chapter 8. Sections 8.1 to 8.9

Recommended Text

F. Chorlton, *Text Book of Fluid Dynamics*, CBS Publications. Delhi, 1985.

Reference Books

1. R.W.Fox and A.T.McDonald. *Introduction to Fluid Mechanics*, Wiley, 1985.
2. E.Krause, *Fluid Mechanics with Problems and Solutions*, Springer, 2005.
3. B.S.Massey, J.W.Smith and A.J.W.Smith, *Mechanics of Fluids*, Taylor and Francis, New York, 2005
4. P.Orlandi, *Fluid Flow Phenomena*, Kluwer, New Yor, 2002.
5. T.Petrila, *Basics of Fluid Mechanics and Introduction to Computational Fluid Dynamics*, Springer, berlin, 2004.

ELECTIVE: PAPER-3
D. ALGEBRAIC TOPOLOGY

Objectives: To introduce the ideas of algebraic topology to other branches of Mathematics.

UNIT – I : CALCULUS IN THE PLANE: PATH INTEGRALS

Angles and Deformations – Differential forms and path Integrals – Independence of Path – Criterion for exactness. Angles and Deformations: Angle functions and Winding numbers – Reparametrizing and Deforming the Paths. Winding Numbers: Definition – Homotopy and Reparametrization – Varying the point – Degrees and Local Degrees.

Chapter – 1: (a) to (c); Chapter – 2: (a) to (b); Chapter – 3: (a) to (d).

UNIT – II: COHOMOLOGY AND HOMOLOGY

De Rham Cohomology and the Jordan Curve Theorem. Definition of the De Rham Graphs – The Coboundary map – the Jordan Curve Theorem – Applications and Variations.

Homology: Chains, Cycles, and H_0U – Boundaries, H_1U , and Winding Numbers – Chains on Grids – Maps and Homology – The First Homology Group for General Spaces.

Chapter 5: (a) to (d); Chapter 6: (a) to (e)

UNIT – III: HOLES AND INTEGRALS

Multiply connected regions – Integrations over continuous Paths and Chains – Periods of Integrals – Complex Integration.

Mayer – Victoris: The Boundary map – Mayer – Victoris for Homology – Variations and applications – Mayer – Victoris for Cohomology.

Chapter 9: (a) to (d); Chapter 10: (a) to (d)

UNIT – IV: COVERING SPACES AND FUNDAMENTAL GROUPS

Covering spaces: Definition – Lifting paths and Homotopies – G-coverings – Covering Transformations. The Fundamental Groups: Definitions and Basic Properties – Homotopy – Fundamental group and Homology. Fundamental Groups and Covering Spaces: Fundamental Group and Coverings – Automorphisms of Coverings – The Universal Covering – Coverings and Subgroups of the Fundamental Group.

Chapter 11: (a) to (d); Chapter 12: (a) to (c); Chapter 13: (a) to (d)

UNIT – V: THE VAN KAMPEN THEOREM

G-Coverings from the Universal Covering – Patching Coverings together – The Van Kampen Theorem.

Cohomology: Patching Coverings and Čech cohomology – Čech Cohomology and Homology – De Rham Cohomology and Homology – Proof of Mayer – Vietoris for De Rham Cohomology.

Chapter 14: (a) to (d); Chapter 15: (a) to (d)

Recommended Text:

William Fulton, Algebraic Topology – A First Course, Springer – Verlag, New York, 1995.

Reference Books:

1. M. K. Agoston, Algebraic Topology – A First Course. Marcel Dekker, 1992.
2. Satya Deo, Algebraic Topology, Hindustan Book Agency, New Delhi, 2003.
3. M. Greenberg and Harper, Algebraic Topology – A First Course, Benjamin / Cummings, 1981.
4. C. F. Maunder, Algebraic topology, Van Nostrand, New York, 1970.
5. J. R. Munkres, Topology, Prentice Hall of India, New Delhi, 2002, [3rd Indian Print].

SEMESTER - IV
PAPER - 13
COMPLEX ANALYSIS - II

Objectives : To study Riemann Theta Function and normal families, Riemann mapping theorem, Conformal mapping of polygons, harmonic functions, elliptic functions and Weierstrass Theory of analytic continuation.

UNIT - I: PARTIAL FRACTIONS AND ENTIRE FUNCTIONS

Partial fractions - Infinite products - Canonical products - Gamma Function - Jensen's formula - Hadamard's Theorem

Chapter 5 : Sections 2.1 to 2.4 ; Chapter 5 : Sections 3.1 and 3.2

UNIT - II: RIEMANN THETA FUNCTION AND NORMAL FAMILIES

Product development - Extension of $\zeta(s)$ to the whole plane - The zeros of zeta function - Equicontinuity - Normality and compactness - Arzela's theorem - Families of analytic functions - The Classical Definition

Chapter 5 : Sections 4.1 to 4.4 ; Chapter 5 : Sections 5.1 to 5.5

UNIT - III: RIEMANN MAPPING THEOREM

Statement and Proof - Boundary Behavior - Use of the Reflection Principle.

Conformal mappings of polygons : Behavior at an angle - Schwarz-Christoffel formula - Mapping on a rectangle.

Harmonic Functions : Functions with mean value property - Harnack's principle.

Chapter 6 : Sections 1.1 to 1.3 (Omit Section 1.4) ;
Sections 2.1 to 2.3 (Omit section 2.4)
Section 3.1 and 3.2

UNIT-IV : ELLIPTIC FUNCTIONS

Simply periodic functions: Representation by exponentials-The Fourier development-Functions of finite order- Doubly periodic functions:The Period Module-Unimodular transformations-The Canonical basis-General properties of Elliptic functions.

Chapter 7 : Sections 1.1 to 1.3 ; Sections 2.1 to 2.4

UNIT-V : WEIRSTRASS THEORY

The Weierstrass \wp -function - The functions $\zeta(z)$ and $\sigma(z)$ - The differential equation -The modular function $\lambda(\tau)$ - The Conformal mapping by $\lambda(\tau)$.

Chapter 7 : Sections 3.1 to 3.5

Recommended Text:

Lars V. Ahlfors, Complex Analysis, (3rd Edition) McGraw Hill Book Company, New York, 1979.

Reference Books

1. H.A. Presfly, Introduction to complex Analysis, Clarendon Press, oxford, 1990.
2. J.B. Corway, Functions of one complex variables, Springer - Verlag, International student Edition, Narosa Publishing Co.
3. E. Hille, Analytic function Thorey (2 vols.), Gonm & Co, 1959.
4. M.Heins, Complex function Theory, Academic Press, New York,1968.

PAPER - 14
FUNCTIONAL ANALYSIS

Objectives : To study the details of Banach and Hilbert Spaces and to introduce Banach algebras.

UNIT-I : BANACH SPACES

Definition - Some examples - Continuous Linear Transformations - The Hahn -Banach Theorem - The natural embedding of N in N^{**}

Chapter 9 : Sections 46 to 49

UNIT-II : BANACH SPACES AND HILBERT SPACES

Open mapping theorem - conjugate of an operator - Definition and some simple properties - Orthogonal complements - Orthonormal sets

Chapter 9 : Sections 50 and 51 ; Chapter 10 : Sections 52, 53 and 54

UNIT-III : HILBERT SPACE

Conjugate space H^* - Adjoint of an operator - Self-adjoint operator - Normal and Unitary Operators - Projections

Chapter 10 : Sections 55, 56, 57, 58 and 59

UNIT-IV : PRELIMINARIES ON BANACH ALGEBRAS

Definition and some examples - Regular and single elements - Topological divisors of zero - spectrum - the formula for the spectral radius - the radical and semi-simplicity.

Chapter 12 : Sections 64 to 69

UNIT-V: STRUCTURE OF COMMUTATIVE BANACH ALGEBRAS

Gelfand mapping - Applications of the formula $r(x) = \lim_{n \rightarrow \infty} \|x^n\|^{1/n}$ - Involutions in Banach Algebras - Gelfand-Neumark Theorem.

Chapter 13 : Sections 70 to 73

Recommended Text:

G.F.Simmons , *Introduction to topology and Modern Analysis*, McGraw Hill International Book Company, New York, 1963.

Reference Books

1. W. Rudin *Functional Analysis*, Tata McGraw-Hill Publishing Company, New Delhi, 1973
2. G. Bachman & L.Narici, *Functional Analysis* Academic Press, New York, 1966.
3. H.C. Goffman and G.Fedrick, *First course in Functional Analysis*, Prentice Hall of India, New Delhi, 1987
4. E. Kreyszig *Introductory Functional Analysis with Applications*, John wiley & Sons, New York.,1978.

PAPER - 15
MATHEMATICAL STATISTICS

Objectives : This course introduces sampling theory, significance tests, estimation, testing of hypotheses, ANOVA and sequential analysis with rigorous mathematical treatment.

UNIT-I : SAMPLE MOMENTS AND THEIR FUNCTIONS

Notion of a sample and a statistic - Distribution of the arithmetic mean of independent normally distributed random variables – The χ^2 - distribution – The distribution of the statistics (\bar{X}, S) – Student's t - distribution - Fisher's Z - distribution - Snedecor's F - distribution - Distribution of sample mean from non-normal populations.

Chapter 9 : Sections 9.1 to 9.8

UNIT-II : SIGNIFICANCE TEST

Kolmogorov Theorem 10.11.1 - Smirnov Theorem 10.11.2 - Concept of a statistical test - Parametric tests for small samples and large samples - χ^2 test - Tests of Kolmogorov and Smirnov type - The Wald-Wolfowitz and Wilcoxon -Mann-Whitney tests - Independence Tests by contingency tables.

Chapter 10 : Section 10.11; Chapter 12 : Sections 12.1 to 12.7

UNIT-III : ESTIMATION

Preliminary notion - Consistent estimation - Unbiased estimates - Sufficiency of an estimate - Efficiency of an estimate - Asymptotically most efficient estimates - methods of finding estimates - confidence Interval.

Chapter 13 : Sections 13.1 to 13.8

UNIT-IV : Analysis of Variance

One way classification and two-way classification. **Hypotheses Testing:** The Power functions and OC function - Most Powerful test - Uniformly most powerful test - unbiased test.

Chapter 15 : Sections 15.1 and 15.2

Chapter 16 : Sections 16.1 to 16.5

UNIT-V : SEQUENTIAL ANALYSIS

SPRT - Auxiliary Theorem - Wald's fundamental identity - OC function and SPRT – The expected value of $E(n)$ - Determination of A and B - Testing a hypothesis concerning p of zero – one distribution - Testing a hypothesis concerning the expected value m of a Normal population.

Chapter 17 : Sections 17.1 to 17.9

Recommended Text:

M. Fisz , *Probability Theory and Mathematical Statistics*, John Wiley and sons, New Your, 1963.

Reference Books:

1. E.J.Dudewicz and S.N.Mishra , *Modern Mathematical Statistics*, John Wiley and Sons, New York, 1988.
2. V.K.Rohatgi *An Introduction to Probability Theory and Mathematical Statistics*, Wiley Eastern New Delhi, 1988(3rd Edn)
3. G.G.Roussas, *A First Course in Mathematical Statistics*, Addison Wesley Publishing Company, 1973
4. B.L.Vander Waerden, *Mathematical Statistics*, G.Allen & Unwin Ltd., London, 1968.

PAPER - 16
DIFFERENCE EQUATIONS

Objectives : To introduce the process of discretization, Discrete version of Differential Equations, Discrete oscillation and the asymptotic behaviour of solutions of certain class of difference equations for linear cases only. Solution of difference equations using z-transforms is stressed.

UNIT-I : LINEAR DIFFERENCE EQUATIONS OF HIGHER ORDER

Difference Calculus - General Theory of Linear Difference Equations - Linear Homogeneous Equations with Constant coefficients - Linear non-homogeneous equations - Method of Undetermined coefficients, the method of variation of constants - Limiting behavior of solutions.

Chapter 2: Sections 2.1 to 2.5

UNIT-II : SYSTEM OF DIFFERENCE EQUATIONS

Autonomous System - The Basic Theory - The Jordan form - Linear periodic system.

Chapter 3: Section 3.1 to 3.4

UNIT-III : THE Z-TRANSFORM METHOD

Definition, Example and properties of Z-transform - The Inverse Z-transform and solution of Difference Equations: Power series method, partial fraction method, the inverse integral method - Volterra Difference Equation of convolution types - Volterra systems.

Chapter 5: Sections 5.1 to 5.3, 5.5 (omit 5.4)

UNIT-IV : ASYMPTOTIC BEHAVIOUR OF DIFFERENCE EQUATION

Tools and Approximations - Poincare's Theorem - Second order difference equations - Asymptotic diagonal systems - Higher order Difference Equations.

Chapter 8 : Sections 8.1 to 8.5

UNIT-V : OSCILLATION THEORY

Three-term difference Equation - Non-linear Difference Equations - Self-Adjoint second order equations.

Chapter 7 : Sections 7.1 to 7.3

Recommended Text:

Saber N. Elaydi, *An Introduction to Difference Equations*, Springer Verlag, New York, 1996.

Reference Books:

1. R.P.Agarwal., *Difference Equations and Inequalities*, Marcel Dekker, 1999.
2. S. Goldberg, *Introduction to Difference Equations*, Dover Publications, 1986
3. V. Lakshmi kantham and Trigiante, *Theory of Difference Equations*, Academic Press, New York, 1988.
4. Peterson, A *Difference Equations, An Introduction with Applications*, Academic Press, New York, 1991.

ELECTIVE: PAPER - 4
(to choose any 1 out of the given 4)
A. NUMBER THEORY AND CRYPTOGRAPHY

Objectives : This course aims to give elementary ideas from number theory which will have applications in cryptology.

UNIT-I : Elementary Number Theory

Time Estimates for doing arithmetic - Divisibility and Euclidean algorithm - Congruences - Applications to factoring.

Chapter – I Sec – 1.1 to 1.4

UNIT-II : Cryptography

Some simple crypto systems - Enciphering matrices

Chapter – III Sec – 3.1 and 3.2

UNIT-III : Finite Fields and quadratic Residues

Finite fields - Quadratic residues and Reciprocity

Chapter – II Sec – 2.1 and 2.2

UNIT-IV : Public Key Cryptography

The idea of public key cryptography - RSA - Discrete log - Knapsack

Chapter-IV Sec – 4.1 to 4.4

UNIT-V : Primality and Factoring

Pseudo primes - The rho method - Fermat factorization and factor bases - The Continued fraction method.

Chapter – V Sec – 5.1 to 5.4

Recommended Text:

Neal Koblitz, *A Course in Number Theory and Cryptography*, Springer-Verlag, New York, 2002, Second Edition.

Reference Books:

1. Niven and Zuckermann, *An Introduction to Theory of Numbers* (Edn. 3), Wiley Eastern Ltd., New Delhi, 1976.
2. David M.Burton, *Elementary Number Theory*, Wm C.Brown Publishers, Dubuque, Iowa, 1989.
3. K.Ireland and M.Rosen, *A Classical Introduction to Modern Number Theory*, Springer Verlag, 1972.

ELECTIVE: PAPER – 4
B. ALGEBRAIC NUMBER THEORY

Objectives : The course aims to provide a study on modules over rings, finite fields, algebraic extensions, number fields and cyclotomic fields, Noetherian rings and modules and Dedekind rings.

UNIT-I : ALGEBRAIC BACKGROUND

Rings and Fields- Factorization of Polynomials - Field Extensions - Symmetric Polynomials - Modules - Free Abelian Groups.

Chapter 1: Sec. 1.1 to 1.6

UNIT-II : ALGEBRAIC NUMBERS

Algebraic numbers - Conjugates and Discriminants - Algebraic Integers - Integral Bases - Norms and Traces - Rings of Integers.

Chapters 2: Sec. 2.1 to 2.6

UNIT-III : QUADRATIC AND CYCLOTOMIC FIELDS

Quadratic fields and cyclotomic fields : Factorization into Irreducibles : Trivial factorization - Factorization into irreducibles - Examples of non-unique factorization into irreducibles.

Chapter 3: Sec. 3.1 and 3.2 ; Chapter 4: Sec. 4.2 to 4.4

UNIT-IV

Prime Factorization - Euclidean Domains - Euclidean Quadratic fields - Consequences of unique factorization - The Ramanujan -Nagell Theorem.

Chapter 4: Sec. 4.5 to 4.9

UNIT-V : IDEALS

Prime Factorization of Ideals - The norms of an Ideal - Non-unique Factorization in Cyclotomic Fields..

Chapter 5 : Sec. 5.2 to 5.4

Recommended Text

I. Steward and D.Tall. *Algebraic Number Theory and Fermat's Last Theorem* (3rd Edition) A.K.Peters Ltd., Natick, Mass. 2002.

Reference Books

1. Z.I.Bosevic and I.R.Safarevic, *Number Theory*, Academic Press, New York, 1966.
2. J.W.S.Cassels and A.Frohlich, *Algebraic Number Theory*, Academic Press, New York, 1967.
3. P.Ribenboim, *Algebraic Numbers*, Wiley, New York, 1972.
4. P. Samuel, *Algebraic Theory of Numbers*, Houghton Mifflin Company, Boston, 1970.
5. A.Weil. *Basic Number Theory*, Springer, New York, 1967.

ELECTIVE: PAPER – 4
C. STOCHASTIC PROCESSES

Objectives : This course aims to introduce advanced topics in Markov process, Markov chains and Renewal theory.

UNIT - I : STOCHASTIC PROCESSES

Specification of stochastic processes – stationary processes – Markov Chains : Definitions and Examples – Higher transition probabilities – Generalization of independent Bernoulli trials.

Chapter 2 : 2.1 to 2.4; Chapter 3 : 3.1 to 3.3

UNIT - II : MARKOV CHAINS

Stability of Markov system – Graph theoretic approach – Markov chain with denumerable number of state – Reducible chains – Statistical inference for Markov chains.

Chapter 3 : 3.6 to 3.10

UNIT - III : MARKOV PROCESS WITH DISCRETE STATE SPACE

Poisson process: Poisson process and related distributions – Generalizations of Poisson process – Birth and death process – Markov process with discrete state space (Continuous time Markov chain).

Chapter 4 : 4.1 to 4.5

UNIT - IV : MARKOV PROCESS WITH CONTINUOUS STATE SPACE

Brownian motion – Wiener process – Differential equations for Wiener Process – Kolmogorov equations – First passage time distribution for Wiener process.

Chapter 5 : 5.1 to 5.5

UNIT - V : RENEWAL PROCESS AND THEORY

Renewal process and renewal equation – Stopping time – Wald's equation – Renewal theorem – Delayed and equilibrium renewal process.

Chapter 6 : 6.1 to 6.6

Recommended Text

J. Medhi, Stochastic Processes (2nd Edition), New Age International, 1992.

Reference Books

1. S. Karlin, A first course in Stochastic Processes, (2nd Edition), Academic Press, 1958.
2. U.N. Bhat, Elements of Applied Stochastic Processes, John Wiley Sons, 1972.
3. E. Cinlar, Introduction to Stochastic Processes, PHI, 1975
4. S.K. Srinivasan and A. Vijayakumar, Stochastic Processes, Narosa, 2003.

ELECTIVE: PAPER – 4
D. MATHEMATICAL SOFTWARES PRACTICAL

Objectives : This course aims to practice the students in Mathematics document preparation and utilizing the software facility available for tedious computations.

□ **CREATING A DOCUMENT USING LATEX**

- ❖ Simple Typesetting
- ❖ Page Layout (page size, margins, page style)
- ❖ Formatting (Font size, Text Alignment)
- ❖ Tables and Figures
- ❖ Typesetting Mathematics
- ❖ Bibliography Management.

□ **MATLAB BASICS**

- ❖ Algebra and Arithmetic
- ❖ Calculus, Graphics and Linear Algebra
- ❖ Curve Fitting and Interpolation
- ❖ Ordinary Differential Equations

Reference Books

1. Latex Tutorials – A PRIMER Indian TEX Users Group, 2002, 2003 Indian TEX Users Group Floor III SJP Buildings, Cotton Hills Trivandrum 695014, India.
2. Brain R. Hunt, Ronald R. Lipsman and Jonathan M. Rosenberg, A Guide to MATLAB for Beginners and experienced users, Cambridge University Press, 2003.
3. Getting Started with MATLAB 7, Rudra Pratap, Oxford University Press, India, 2006.
4. Rose L. Spencer, Introduction to MATLAB.

COMPUTER LABORATORY PRACTICE EXERCISES

LATEX

1. Create a document file to prepare a Chapter in a Book.
2. Create a document file to prepare a research article.

MATLAB

1. Multiplication of matrices of order 4×4
2. Solution to linear non-homogeneous equations (4 unknowns)
3. Rank of a matrix of order atleast 4
4. Solving ordinary differential equations
5. Plotting of two and three dimensional graphs SPSS
6. Drawing Histograms, frequency curves and frequency polygons
7. Finding central measures and measures of dispersion
8. Finding correlation and rank correlation
9. Finding partial and multiple correlation
10. Calculation of ANOVA

THIRUVALLUVAR UNIVERSITY
MASTER OF SCIENCE
DEGREE COURSE
M.Sc. PHYSICS
UNDER CBCS
(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S.NO. | Study Components | | Ins. hrs /week | Credit | Title of the Paper | Maximum Marks | | |
|-------------|------------------|---------|----------------|--------|---|---------------|-----------|-------|
| | Course Title | | | | | | | |
| SEMESTER I | | | | | | CIA | Uni. Exam | Total |
| 1 | MAIN | Paper-1 | 6 | 5 | Mathematical Physics -I | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 6 | 5 | Classical and Statistical Mechanics | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 5 | 5 | Quantum Mechanics - I | 25 | 75 | 100 |
| 4 | MAIN PRACTICAL | Paper-1 | 4 | - | General Experiments | - | - | - |
| 5 | MAIN PRACTICAL | Paper-2 | 4 | - | Electronics Experiments | - | - | - |
| 6 | ELECTIVE | Paper-1 | 5 | 3 | (to choose 1 out 3) A. Electronic Devices and Applications B. Electronics Instrumentation C. Electronics communication systems | 25 | 75 | 100 |
| | | | 30 | 18 | | 125 | 375 | 400 |
| | | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni. Exam | Total |
| 7 | MAIN | Paper-4 | 5 | 4 | Mathematical Physics -II | 25 | 75 | 100 |
| 8 | MAIN | Paper-5 | 5 | 4 | Electromagnetic Theory and Plasma Physics | 25 | 75 | 100 |
| 9 | MAIN | Paper-6 | 5 | 5 | Quantum Mechanics II | 25 | 75 | 100 |
| 10 | MAIN PRACTICAL | Paper-1 | 4 | 4 | General Experiments | 25 | 75 | 100 |
| 11 | MAIN PRACTICAL | Paper-2 | 4 | 4 | Electronics Experiments | 25 | 75 | 100 |
| 12 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 13 | ELECTIVE | Paper-2 | 5 | 3 | (to choose 1 out 3) A. Nano Science B. Fibre Optics C. Non linear Optics | 25 | 75 | 100 |
| | | | 30 | 26 | | 150 | 450 | 700 |

| SEMESTER III | | | | | | CIA | Uni. Exam | Total |
|---------------------|----------------|----------|-----------|-----------|---|------------|------------------------------|--------------|
| 14 | MAIN | Paper-7 | 5 | 5 | Spectroscopy | 25 | 75 | 100 |
| 15 | MAIN | Paper-8 | 5 | 5 | Nuclear and Particle Physics | 25 | 75 | 100 |
| 16 | MAIN | Paper-9 | 5 | 5 | Microprocessor and Microcontroller | 25 | 75 | 100 |
| 17 | MAIN PRACTICAL | Paper-3 | 5 | - | Advanced General Experiments | - | - | - |
| 18 | MAIN PRACTICAL | Paper-4 | 5 | - | Microprocessor, Microcontroller and C Programming | - | - | - |
| 19 | ELECTIVE | Paper-3 | 5 | 3 | (to choose 1 out 3) A. Crystal Growth and Thin Films B. Advanced Spectroscopy C. Advanced Nuclear Physics | 25 | 75 | 100 |
| | | | 30 | 18 | | 125 | 375 | 400 |
| SEMESTER IV | | | | | | CIA | Uni. Exam | Total |
| 20 | MAIN | Paper-10 | 5 | 5 | Material Science and Laser Physics | 25 | 75 | 100 |
| 21 | MAIN | Paper-11 | 5 | 5 | Condensed matter Physics | 25 | 75 | 100 |
| 22 | MAIN | Paper-12 | 5 | 5 | Project with <i>viva voce</i> | - | 100 (75 Project +25 viva) | 100 |
| 23 | MAIN PRACTICAL | Paper-3 | 5 | 5 | Advanced General Experiments | 25 | 75 | 100 |
| 24 | MAIN PRACTICAL | Paper-4 | 5 | 5 | Microprocessor, Microcontroller and C Programming | 25 | 75 | 100 |
| 25 | ELECTIVE | Paper-4 | 5 | 3 | (to choose 1 out 3) A. Advanced Microprocessor B. C Programming and MATLAB C. Numerical Methods and programming in C | 25 | 75 | 100 |
| | | | 30 | 28 | | 255 | 345 | 600 |

| Subject | Papers | Credit | Total Credits | Marks | Total marks |
|------------------|-----------|----------|---------------|----------|-------------|
| MAIN | 12 | 4-5 | 58 | 100 | 1200 |
| MAIN PRACTICAL | 4 | 4-5 | 18 | 100 | 400 |
| ELECTIVE | 4 | 3 | 12 | 100 | 400 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| Total | 21 | - | 90 | - | 2100 |

Project

There will be a Project work at the end of the Semester IV. The guidelines for the Project work with Viva-voce as follows.

- a) The Project work carries 100 marks for which the Project report shall be evaluated for 75 marks and the Viva-voce carries 25 marks. The marks for Project report and Viva-voce are to be awarded jointly by the external examiners in consultation with project supervisor.
- b) The Project report may consist of 40 to 50 pages.
- c) The candidate has to submit the Project report 15 days before the commencement of the IV Semester examinations.
- d) A candidate who fails in the Project/Dissertation may resubmit the report (on the same topic) with necessary modification/correction/ improvements in the subsequent even Semester examination for evaluation.
- e) Each candidate shall be required to appear for Viva-voce examination (in defense of the Project only)

THIRUVALLUVAR UNIVERSITY

M.Sc. PHYSICS

SYLLABUS

UNDER CBCS

(With effect from 2017-2018)

SEMESTER I

PAPER-1

MATHEMATICAL PHYSICS I

UNIT-I: Linear Vector Spaces and Matrices

Linear Vector Spaces: Linear independence, basis and dimension - inner products. Orthonormality and completeness - Schwartz Inequality - Orthonormal basis - Gram-Schmidt orthogonalization process - Linear operators - Vectors in n dimensions - Matrix algebra, similarity transforms, matrix diagonalization - Orthogonal, Hermitian and Unitary matrices- Properties.

UNIT –II: Tensors

Coordinate transformation– summation convention - Contravariant, Covariant and mixed tensors – Rank of a tensor – symmetric and anti-symmetric tensors - Invariant tensors - Kronecker delta, Levi-civita tensor in three dimensions – contraction of tensors - product rule - Quotient rule - tensors of higher rank- Tensor forms of Operators.

UNIT-III: Ordinary Differential Equations

Second order linear differential equations: Wronskian, Ordinary and singular points- series solutions - Generating functions – Rodrigue’s formula - Orthogonality relations - Important recurrence relations for Bessel, Legendre, Hermite and Laguerre functions - Spherical harmonics.

UNIT – IV: Green’s functions

Dirac-delta function - Green’s function - One dimensional Green function - boundary conditions – Eigen function - expansion of the Green’s function- Reciprocity theorem – Sturm-Liouville type equations in one dimension and their Green’s functions.

UNIT V: Probability theory and Random variables

Probability distributions and probability densities - Binomial, Poisson's and Normal - standard discrete and continuous probability distributions - moments and generating functions - Central limit theorem (statement and applications).

Books for Study:

1. P.K. Chattopadhyay, Mathematical Physics, Wiley Eastern, Madras, 1990.
2. G. Arfken and H.J. Weber, Mathematical Methods for Physicists, 5th Edition, Harcourt (India), New Delhi, 2001.
3. M.D. Greenberg, Advanced Engineering Mathematics, 2nd Edition, International Ed., Prentice - Hall International, New Jersey, 1998.
4. E. Kreyszig, Advanced Engineering Mathematics, 8th Edition Wiley, New York, 1999.
5. B.D. Gupta, Mathematical Physics, Vikas publishing house 3rd Edition, New Delhi, 2006.
6. Satyaprakash, Mathematical Physics, Sultan Chand & sons, New Delhi, 2004.

Books for Reference:

1. Schaum's outline series, McGraw Hill, (i) Vector and tensor analysis, (ii) Linear Algebra, (iii) Matrices, (iv) Differential Equations (v) Probability (vi) Statistics, 1964.
2. P.R Halmos, Finite dimensional Vector Spaces, 2nd Edition. Affiliated East - West, New Delhi, 1965.
3. C.R. Wylie and LC. Barrett, Advanced Engineering Mathematics, 6th Edition., International Edition. McGraw Hill, New York, 1995.
4. P.K. Chakrabarti and S.N. Kundu, A Text Book of Mathematical Physics, New Central Book Agency, Kolkata, 1996.
5. A.K. Ghatak, I.C. Goyal and S.H. Chua, Mathematical Physics Macmillan India, New Delhi, 2002.

PAPER-2

CLASSICAL AND STATISTICAL MECHANICS

PART A: CLASSICAL MECHANICS

UNIT-I: Lagrangian and Hamiltonian formulation

Hamilton's Variational Principle and Lagrange's equation - Lagrange Problems - Double Pendulum, Spherical pendulum, Cylinder rolling down an inclined plane - Hamilton's equations - cyclic variables – Principle of least action – Hamiltonian Problems - motion of a particle in a central force field, charged particle moving in an electromagnetic field – Equations of motion and first integrals – Scattering by central potential – Kepler's laws – Transformation from centre of mass to laboratory frame.

UNIT-II: Rigid body dynamics and Canonical transformations

Rigid body motion – Kinematics - Euler's angles - Angular momentum and kinetic Energy – Moment of inertia tensor - Euler's equations of motion – Torque-free motion of a rigid body - Motion of a symmetrical top under the action of gravity - Canonical transformation and their generators – simple examples – Poisson brackets – Equations of motion in Poisson bracket form - Noether's theorem.

UNIT-III: Hamilton - Jacobi Theory and Theory of Small Oscillations

Hamilton-Jacobi equations – Application to Linear harmonic oscillator problem - Action Angle variables - Application to Kepler's problem - Oscillatory motion - Theory of small oscillation – Two coupled pendulums - Linear triatomic molecule - Stability of Oscillatory motion - Forced Harmonic Oscillator - non- linear Oscillation in a symmetric potential.

PART B: STATISTICAL MECHANICS

UNIT-IV: Thermodynamics and Classical statistics

Thermodynamic parameters – thermodynamic potentials – Gibbs phase rule – First and second order phase transitions – Ehrenfest's equations - Random walk - Brownian motion - Langevin theory - Einstein theory.

Classical Statistics: Microstates and Macrostates - Phase space - Liouville theorem and its significance - ensembles - Micro Canonical, Canonical and Grand Canonical ensembles - Partition function - Translational partition functions - Gibbs's Paradox - Sackur- Tetrode equation.

UNIT-V: Quantum Statistics

Quantum Statistics of ideal gas - Ideas of Bose-Einstein and Fermi-Dirac Particles - Degeneracy of gases - Bose-Einstein condensation of gases - Photon gas - Planck's law of radiation and its limitation - Thermionic emission - Pauli's theory of Paramagnetism - Ising model.

Books for Study:

1. H. Goldstein, Classical Mechanics. 3rd Edition. Pearson Education, Asia, New Delhi, 2002.
2. S.N. Biswas, Classical Mechanics, Books and Allied Ltd., Kolkata, 1998.
3. Upadhyaya, Classical Mechanics, Himalaya Publishing Co., New Delhi, 1999.
4. Gupta Kumar Sharma, Classical Mechanics, Pragati Prakashan, Meerut, 2004.
5. K. Huang, Statistical Mechanics, Wiley Eastern Ltd., New Delhi, 1975.
6. B.K. Agarwal and M. Eisner, Statistical Mechanics, 2nd Edition, New Age International, New Delhi, 1998.
7. Sathya Prakash and J.P Agarwal, Statistical Mechanics, 7th Edition, Kedar Nath and Ram Nath & Co, Meerut, 1994.
8. J.K.Bhattacharjee, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi, 1996.

Books for Reference:

1. L.D. Landau and E.M. Lifshitz, Mechanics, Pergomon Press, Oxford, 1969.
2. K.R. Symon, Mechanics, Addison Wesley, London, 1971.
3. J.L. Synge and B.A Griffith, Principles of Classical Mechanics, Mc.Graw-Hill, New York, 1949.
4. C.R.Mondal, Classical Mechanics, Prentice - Hall of India, New Delhi.
5. L.P. Kadanoff, Statistical Physics - Statics, Dynamics and Renormalization, World Scientific, Singapore, 2001.
6. M. Glazer and J. Wark, Statistical Mechanics, Oxford University Press, Oxford, 2001.

PAPER-3
QUANTUM MECHANICS I

UNIT-I: Basic formalism

Wave functions for a free particle - Interpretation and conditions on the wave function - Postulates of quantum Mechanics and the Schrödinger equations – time dependent, independent - Expectation Value - Stationary States - Ehrenfest's theorem - Hermitian Operators for dynamical variables - Eigen values and Eigen functions - Uncertainty Principle.

UNIT-II: One Dimensional and Three Dimensional Problems

One Dimensional: Particle in a box – simple harmonic oscillator - Square well potential – Barrier penetration – Three Dimensional: Orbital angular momentum and spherical harmonics - Central forces and reduction of two body problem - Particle in a Spherical well - Hydrogen atom.

UNIT-III: General formalism

Hilbert's space - Dirac notation - Representation theory - Co-ordinate and momentum representations - Time evolution - Schrödinger, Heisenberg and Interaction pictures - Symmetries and conservation laws.

UNIT-IV: Approximation methods

Time-independent perturbation theory for non- degenerate and degenerate levels - Application to ground state of an harmonic oscillator and Stark effect in Hydrogen - Variation method -Application to ground state of Helium atom - WKB approximation - WKB quantization rule - Application to simple Harmonic Oscillator.

UNIT-V: Angular momentum and identical particles

Ladder Operators - Commutation rules for angular momentum operators - Eigen value spectrum from angular momentum algebra - Matrix representation - Spin angular momentum – Non-relativistic Hamiltonian including spin - Addition of two angular momenta - Clebsch- Gordan coefficients - Symmetry and anti symmetry of wave functions - Pauli's spin matrices.

Books for Study:

1. P.M. Mathews and K. Venkatesan, A Text book of Quantum Mechanics, Tata McGraw-Hill, New Delhi, 1976.
2. L.I. Schiff, Quantum Mechanics, 3rd Edition, International Student Edition, McGraw-Hill Kogakusha, Tokyo, 1968.
3. V. Devanathan, Quantum Mechanics, Narosa Publishing House, New Delhi, 2005.
4. V.K. Thankappan, Quantum Mechanics, 2nd Edition, Wiley Eastern Ltd, New Delhi, 1985.
5. G. Aruldas, Quantum Mechanics, Prentice-Hall of India, New Delhi, 2002.
6. Sathya Prakash Swati Saluja, Quantum Mechanics, Kedar Nath Ram Nath & Co Meerut, 2016.

Books for Reference:

1. E. Merzbacher, Quantum Mechanics 2nd Edition, John Wiley and Sons, New York, 1970.
2. P.A.M. Dirac, The Principles of Quantum Mechanics, Oxford University Press, London, 1973.
3. L.D. Landau and E.M. Lifshitz, Quantum Mechanics, Pergomon Press, Oxford, 1976.
4. Ajoy Ghatak, Loganathan, Quantum Mechanics theory and applications, Fourth edition, Macmillan, 1999.
5. Franz Schwabl, Quantum Mechanics, Narosa Publishing House, 1998.
6. B.S. Rajput, Advanced Quantum Mechanics, Seventh Edition, A Pragati Prakashan, 2007.
7. J.J. Sakurai, Modern Quantum Mechanics, Benjamin Cummings, 1985.
8. R.P. Feynman, R.B. Leighton and M. Sands, The Feynman Lectures on Physics, Vol.3, Narosa Publishing House, 1992.

ELECTIVE

PAPER - 1

(to choose 1 out of 3)

A. ELECTRONIC DEVICES AND APPLICATIONS

UNIT-I: Fabrication of IC and logic families

Fabrication of IC - Monolithic integrated circuit fabrication - pressure transducers - Monolithic RMS Voltage measuring device - Monolithic voltage regulators - Integrated circuit multipliers - Integrated circuit logic - Schottky TTL - P and N-MOS Logic - CMOS Logic - Tristate logic circuits.

UNIT-II: Opto electronic devices

Light sources and Displays - Light emitting diodes - Surface emitting LED - Edge Emitting LED - Seven segment display - LDR - Diode lasers - Photo detectors - Basic parameters - Photo diodes - p-i-n Photo diode - Solar cells - Photo transistors - IR and UV detectors.

UNIT-III: 555 Timer and applications

555 Timer - Description - Monostable operation - Frequency divider - Astable operation - Schmitt trigger - Phase Locked Loops - Basic principles - Analog phase detector - Voltage Controlled Oscillator - Voltage to Frequency conversion – temperature coefficient of resistance using IC 555 - PLL IC 565 - Description - Lock-in range - Capture range - Application - Frequency multiplication.

UNIT-IV: Op-amp applications

Instrumentation amplifier - V to I and I to V converter - Op-amp circuits using diodes - Sample and Hold circuits - Log and Antilog amplifiers - Multiplier and Divider - Electronic analog Computation solving simultaneous and differential equation- Schmitt Trigger - Astable, Monostable Multivibrator – Triangular wave generator - Sine wave generator - Active filters – Low, High and Band pass first and second order Butterworth filters – wide and narrow band reject filters.

UNIT-V: Pulse and digital Communication

Pulse communications - Introduction - Types - Pulse-Amplitude Modulation (PAM) - Pulse Time Modulation (PTM) : Pulse Width Modulation (PWM) - Pulse Position Modulation (PPM) - Pulse Code Modulation (PCM) - Principles of PCM - Quantizing noise - Generation and Demodulation of PCM - Effects of Noise - Advantages and applications of PCM - Pulse systems - Frequency-Shift keying - Digital communication - Modem classification - Modes of modem operation - Modem interconnection - Modem interfacing.

Books for Study:

1. S.M. Sze, Semiconductor Devices - Physics and Technology, Wiley, New York, 1985.
2. Millman and Halkias, Integrated Electronics, McGraw-Hill, New Delhi.
3. R.A. Gaekwad, Op-Amps and integrated circuits EEE, 1994.
4. Taub and Shilling, Digital Integrated Electronics, McGraw-Hill, New Delhi, 1983.
5. J. Millman, Digital and Analog Circuits and Systems, McGraw-Hill, London, 1979.
6. George Kennedy, Electronic communication systems 3rd Edition, McGraw-Hill, London, 1987.
7. G.S.N. Raju, Electronic Devices and Circuit , I.K. International Publishing House Pvt. Ltd., New Delhi, 2010.

Books for Reference:

1. R.F. Coughlin and F.F, Driscoll, Op-Amp and linear integrated circuits, Prentice Hall of India, New Delhi, 1996.
2. M.S.Tyagi, Introduction to Semiconductor Devices, Wiley, New York.
3. P. Bhattacharya, Semiconductor Optoelectronic Devices, 2nd Edition, Prentice-Hall of India, New Delhi, 2002.
4. Deboo/ Burrous, Integrated circuits and semiconductor Devices – Theory and application, McGraw-Hill, New Delhi, 1985.
5. D. Roy Choudhury, Linear integrated circuits, Wiley Eastern, New Delhi, 1991.
6. Ramakant Gaekwad, Operational amplifiers, Wiley Eastern, New Delhi, 1981.
7. Louis E. Fresnel, Communication Electronics : principles and Applications, TMH Pub. Co., Ltd, 2002.

PAPER – 1

B. ELECTRONIC INSTRUMENTATION

UNIT-I : Transducers

Classification of Transducers - Principle, construction and working of Thermistor - LVDT, Electrical strain gauges and capacitive transducers, Photoelectric transducer, Piezoelectric transducer - Measurement of non-electrical quantities - Strain, Displacement, temperature, Pressure, Magnetic fields, vibration, optical and particle detectors.

UNIT-II: Digital Instrumentation

Principle, block diagram and working of Digital frequency counter, digital multimeter, digital pH meter, digital conductivity meter and digital storage oscilloscope.

UNIT-III: Analytical Instrumentation

Principle, block diagram, description, working and applications of UV-VIS spectrometer, IR spectrometer, Flame emission spectrometer and ICP - AES spectrometer - Basic concepts of Gas and Liquid Chromatography.

UNIT-IV: Bio-Medical Instrumentation

Physiological transducers to measure blood pressure, body temperature - Sources of Bio-electric potentials - resting potential, action potential, bio-potential electrodes - Principle, block diagram and operation of ECG and EEG - recorders.

UNIT-V: Computer Peripherals

Printers - Printer mechanism – Classification - Dot matrix, Ink jet and laser printers - Basic concepts of key board and mouse. Mass data storage - Hard Disk - Optical disk (CD) – DVD –Blueray disc – Universal Serial Bus (USB).

Books for Study:

1. Dr.Rajendra Prasad, Electronic Measurements and Instrumentation, Khanna Publications.
2. S.Ramabhadran, Electronic Measurements and Instrumentation Khanna Publications.
3. Leslie Cromwell fred J. Weibell, Erich A. Pfeiffer, Biomedical Instrumentation and Measurements 2nd Edition, Prentice –Hall of India Private Ltd, New Delhi, 2010.

Books for Reference:

1. S.M. Dhir, Electronics and Instrumentation, Khanna Publishers, Khandpur.
2. Albert D. Heltrick, William D. Cooper, Modern Electronics Instrumentation and measurement Techniques, PHI, New Delhi.

PAPER – 1

ELECTRONICS COMMUNICATION SYSTEMS

UNIT I- Signal Encoding Techniques

Antennas: types-Propagation modes – line of sight transmission- fading in the mobile environment – signal encoding techniques: criteria- ASK – FSK – BPSK – MFSK – PSK – BPSK – QPSK –multilevel PSK – AM modulation – Angle modulation – PCM – delta and adaptive delta modulation.

UNIT II – Coding and Error Control

Error detection – Parity check – cycle redundancy check – block error correction codes – hamming code – cyclic codes – BCH code – reed – Solomon codes – block interleaving – convolution codes – decoding – turbo coding – automatic repeat request – flow control – error control.

UNIT III – Satellite Communication

Satellite parameters and configurations – Satellite orbits – GEO – MEO – LEO – frequency bands – transmission impairments – Satellite foot print – atmospheric attenuation – satellite network – configuration – capacity allocation – multiplexing : FDM and TDM.

UNIT IV – Cellular wireless networks

Principles of cellular networks : Organization – frequency reuse – operation – mobile radio propagation effects – hand-off – power control – traffic engineering – first generation analog – AMPS – second generation – TDMA – mobile wireless TDMA design consideration – CDMA – mobile wireless CDMA design considerations – Soft handoff –IS 95 – Third generation systems – wireless local loop.

UNIT V – Wireless LANS

Overview: Wireless LAN applications, requirements and technology – Infrared LANS – spread spectrum LANS – narrow band microwave LANS – IEEE 802 architecture – IEEE 802.11 architecture.

Book for study:

1. William Schweber, Electronic Communication Systems, Complete Course Pearson Pub, 2011.
2. George Kennedy, Electronic Communication Systems, 3rd Edition, Tata McGraw-Hill Edition, New Delhi, 2008.

Book for References:

1. William Stallings, Wireless communications and Networks, Pearson education, Asia, 2002.
2. Robert J. Schoenbeck, Electronic communications, modulation and transmission PHI, 1999.
3. P. Gnanasivam, Telecommunication switching and networks, PHI, 2004.

SEMESTER II

PAPER-4

MATHEMATICAL PHYSICS II

UNIT-I: Complex Variables

Functions of a complex variable – Single and multi valued functions - Analytic functions - Cauchy Riemann conditions – Singular points - Cauchy's integral theorem and formula - Taylor and Laurent expansions – Zeros and poles - Residue theorem - applications to evaluation of definite integrals.

UNIT –II: Partial differential equations

Laplace's equations – solutions of Laplace's Equations using cylindrical and spherical harmonics – Diffusion equation (Fourier equation of heat flow) – solutions of two and three dimensional heat flow - Wave equations – D' Alembert's solution - Interpretation - Vibrations of a rectangular membrane – Normal modes in three dimensions.

UNIT – III Laplace and Fourier Transforms

Laplace transforms: solution of linear differential equations with constant Coefficients – Fourier integral. Fourier transforms: Fourier sine and cosine transforms – Convolution theorems – Applications.

UNIT-IV: Group Theory

Definition of groups, subgroups and conjugate classes - Symmetry elements, Transformation, Matrix representation - Point groups - representation of a group - Reducible and irreducible representations - Orthogonality theorem - character of a representation - character Table C_{2v} and C_{3v} – Application to IR and Raman active vibrations of XY_3 molecules - Symmetry rotations $SO(2)$ and $SO(3)$ groups - Symmetry Unitary $SU(2)$ and $SU(3)$ groups.

UNIT –V Relativity

Relativistic mass-energy and momentum-energy relation – Relativistic Doppler effect – Velocity addition formula and its criticism - Relativistic Lagrangian and Hamiltonian for a particle – Minkowski's Space – four vectors – space-time and energy-momentum four vectors – centre of mass system for two relativistic particles – Invariance of Maxwell's field equations.

Books for Study:

1. P.K. Chattopadhyay, Mathematical Physics Wiley Eastern, Madras, 1990.
2. G. Arfken and H.J. Weber, Mathematical Methods for Physicists, 5th Edition, Harcourt, New Delhi, 2001.
3. M.D. Greenberg, Advanced Engineering Mathematics, 2nd Edition, International Ed., Prentice - Hall International, New Jersey, 1998.
4. E. Kreyszig, Advanced Engineering Mathematics, 8th Edition Wiley, New York, 1999.
5. B.D. Gupta, Mathematical Physics, Vikas publishing house 3rd Edition, New Delhi, 2006.
6. Satyaprakash, Mathematical Physics, Sultan Chand & sons, New Delhi, 2004.
7. F.A. Cotton, Chemical Application of Group Theory 3rd Edition, John Wiley and Sons, New York.
8. A.W. Joshi, Elements of group Theory for Physicists, 4th Edition, New Age International, New Delhi, 1997.
9. R. Resnick, Introduction to special theory of Relativity.
10. D. Rindler, Special Theory of Relativity, Oxford University Press, 1982.

Books for Reference:

1. Schaum's outline series, McGraw Hill, (i) Complex Variables, (ii) Laplace Transforms, (iii) Group Theory, (iv) Differential equations, 1964.
2. P.R. Halmos, Finite dimensional Vector Spaces, 2nd Edition. Affiliated East - West, New Delhi, 1965.
3. M. Hamermesh, Group Theory and Its application to Physical Problems Addison Wesley, London, 1962.
4. C.R. Wylie and L.C. Barrett, Advanced Engineering Mathematics, 6th Edition., International Edition. McGraw Hill, New York, 1995.
5. P.K. Chakrabarti and S.N. Kundu, A Text Book of Mathematical Physics, New Central Book Agency, Kolkata, 1996.
6. A.K. Ghatak, I.C. Goyal and S.H. Chua, Mathematical Physics Macmillan India, New Delhi, 2002.

PAPER-5

ELECTROMAGNETIC THEORY AND PLASMA PHYSICS

UNIT I: Electrostatics

Laplace and Poisson equations – Boundary value problems - boundary conditions and uniqueness theorem – Laplace equation in three dimensions– Solution in Cartesian and spherical polar co ordinates – Examples of solutions for boundary value problems - Polarization and displacement vectors - Boundary conditions - Dielectric sphere in a uniform field – Molecular polarisability and electrical susceptibility –Langevin Theory of Polar molecules - Electrostatic energy in the presence of dielectric – Multipole expansion.

UNIT II: Magnetostatics

Biot-Savart Law - Ampere's circuital law - Magnetic vector potential and magnetic field of a localised current distribution - Magnetic moment, force and torque on a current distribution in an external field - Magnetostatic energy - Magnetic induction and magnetic field in macroscopic media - Boundary conditions - Uniformly magnetised sphere.

UNIT III: Maxwell Equations

Faraday's laws of Induction - Maxwell's displacement current - Maxwell's equations – free space and linear isotropic media - Vector and scalar potentials - Gauge invariance - Wave equation and plane wave solution- Coulomb and Lorentz gauges - Energy and momentum of the field - Poynting's theorem - Lorentz force - Conservation laws for a system of charges and electromagnetic fields.

UNIT IV: Electromagnetic Waves

Plane waves in non-conducting media - Linear and circular polarization, reflection and refraction at a plane interface- Fresnel's law, interference, coherence and diffraction - Waves in a conducting medium - Propagation of waves in a rectangular wave guide - Inhomogeneous wave equation and retarded potentials - Radiation from a localized source - Oscillating electric dipole.

UNIT V: Elementary Plasma Physics

The Boltzmann Equation - Simplified magneto-hydrodynamic equations - Electron plasma oscillations - The Debye shielding problem - Plasma confinement in a magnetic field - Magneto-hydrodynamic waves - Alfven waves and magnetosonic waves.

Books for Study:

1. D.J. Griffiths, Introduction to Electrodynamics, 3rd Edition, Prentice-Hall of India, New Delhi, 2002.
2. J.R. Reitz, F. J. Milford and R. W. Christy, Foundations of Electromagnetic Theory, 3rd edition, Narosa Publication, New Delhi, 1986.
3. J. D. Jackson, Classical Electrodynamics, Wiley Eastern Ltd. New Delhi, 1975.
4. J. A. Bittencourt, Fundamentals of Plasma Physics, Pergamon Press, Oxford, 1988.
5. P.Lorrain, D.Corson, Electromagnetic fields and waves, CBS Publishers and distributors, 1986.

Books for Reference:

1. W. Panofsky and M. Phillips, Classical Electricity and Magnetism, Addison Wesley, London, 1962.
2. J. D. Kraus and D. A. Fleisch, Electromagnetics with Applications, 5th Edition, WCB McGraw-Hill, New York, 1999.
3. B. Chakraborty, Principles of Electrodynamics, Books and Allied, Kolkata, 2002.
4. R. P. Feynman, R. B. Leighton and M. Sands, The Feynman Lectures on Physics, Vols. 2, Narosa, New Delhi, 1998.

PAPER-6

QUANTUM MECHANICS II

UNIT-I: Scattering Theory

The scattering problem - formulation –cross sections - Scattering amplitude – Greens function approach - Born approximation and its validity - Partial wave analysis - optical theorem - Phase shifts - Scattering length and effective range - Low energy scattering - Transformation from centre of mass to laboratory frame.

UNIT-II: Perturbation Theory

Time dependent perturbation theory - Constant and harmonic perturbations - Transition probabilities – Fermi-Golden rule - Selection rules for dipole radiation - Adiabatic approximation - Sudden approximation - The density matrix - spin density matrix and magnetic resonance - Semi classical treatment of an atom with electromagnetic radiation.

UNIT-III: Relativistic Quantum Mechanics

Klein-Gordon equation - Failures - Dirac equation - Plane - wave solutions - Interpretation of negative energy states - Antiparticles - Spin of electron - Magnetic moment of an electron due to spin - Energy values in a coulomb potential.

UNIT-IV: Dirac equation

Covariant form of Dirac equation - properties of gamma matrices - Traces -Separation of the equation and the Hydrogen atom problem - Invariance of Dirac equation under Lorentz transformation - T-Transformation for the Dirac equation in presence of electromagnetic field.

UNIT-V: Quantisation of Fields

Relativistic Lagrangian and Hamiltonian of a charged particle in an electromagnetic field - The Lagrangian and Hamiltonian formulations of field – Quantum equation for the field - Second quantization of Klein-Gordon field - creation and annihilation operators - Commutation relations - Quantization of electromagnetic field - Quantization of Schroedinger's field - Quantization of Dirac field.

Books for Study:

1. P.M. Mathews and K. Venkatesan, A Text book of Quantum Mechanics, Tata Mc Graw-Hill, New Delhi, 1976.
2. L.I. Schiff, Quantum Mechanics, 3rd Edition, International Student Edition, McGraw-Hill, Kogakusha, Tokyo, 1968.
3. E. Merzbacher, Quantum Mechanics, 2nd Edition, John Wiley and Sons, New York, 1970.
4. J.D. Bjorken and S.D. Drell, Relativistic Quantum Mechanics, McGraw-Hill, New York, 1964.
5. V. Devanathan, Quantum Mechanics, Narosa Publishing House, New Delhi, 2005.
6. P.A. M. Dirac, The Principles of Quantum Mechanics, Oxford University Press, London, 1973.
7. B.K. Agarwal, Quantum Mechanics and Field Theory, Lokbharti Publications, India, 1976.
8. Amitabha Lahiri and B.G. Pal, A First Book of Quantum Field Theory, Narosa Publications, New Delhi, 2005.

Books for Reference:

1. V.K. Thankappan Quantum Mechanics, 2nd Edition, Wiley Eastern Ltd, New Delhi, 1985,.
2. V. Devanathan, Angular Momentum Techniques in Quantum Mechanics, Kluwer Academic Publishers, Dordrecht, 1999.
3. L.D. Landau and E.M. Lifshitz, Quantum Mechanics, Pergomon Press, London, 1958.
4. J.S. Bell, Gottfried, M. Veltman, The Foundations of Quantum Mechanics, World Scientific, 2001.
5. G. Aruldas, Quantum Mechanics, Prentice-Hall of India, New Delhi, 2002.
6. Claude Itzykson, Isau Bernard Zuber, Quantum Field Theory, McGraw-Hill International Edition, 1987.
7. Leslie E. Vallentine, Quantum Mechanics - A Modern Development, World Scientific Publications Pvt. Ltd, Singapore, 1998.

**MAIN PRACTICAL
PAPER-1
GENERAL EXPERIMENTS**

(Any 15 out of the given 25)

1. Cornu's method - Young's modulus by elliptical fringes.
2. Cornu's method - Young's modulus by hyperbolic fringes.
3. Determination of Stefan's constant.
4. Band gap energy - Thermistor.
5. Hydrogen spectrum - Rydberg's constant.
6. Co-efficient of linear expansion - Air wedge method.
7. Permittivity of a liquid using RFO.
8. Viscosity of liquid - Meyer's disc.
9. Solar spectrum - Hartmann's Interpolation formula
10. F.P. Etalon – spectrometer – determination of spacing between two plates
11. Iron / Copper arc spectrum.
12. Brass / Alloy arc spectrum.
13. B-H loop using Anchor ring.
14. Specific charge of an electron -Thomson's method / Magnetron method.
15. Electrical resistance of a metal / alloy as a function of temperature by four probe method
16. Edser and Butler fringes - Thickness of air film.
17. Spectrometer - Polarisability of liquids.
18. Spectrometer - Charge of an electron.
19. Determination of strain hardening co-efficient.
20. Thickness of the enamel coating on a wire - by diffraction.
21. Lasers: Study of laser beam parameters.
22. Measurement of Numerical aperture (NA) of a telecommunication graded index optic fiber.
23. Fiber attenuation of a given optical fiber.
24. Determination of solar constant.
25. Biprism - Wavelength of monochromatic source - Refractive Index of a liquid.

MAIN PRACTICAL
PAPER-2
ELECTRONICS EXPERIMENTS
(Any 20 out of the given 25)

1. FET as amplifier – frequency response, input impedance and output impedance.
2. Switching and power control using SCR and Triac.
3. Op-amp - Inverting, Non-inverting amplifier - Voltage follower - summing, difference, average amplifier - differentiator and integrator.
4. Op-amp - Study of the attenuation characteristics and design of the phase-shift Oscillator.
5. Op-amp - Study of the attenuation characteristics and design of the Wien Bridge Oscillator.
6. Op-amp - Solving simultaneous equations
7. Op-amp - Design of square wave, saw tooth wave, and Triangular wave generators.
8. Op-amp - Design of Schmitt Trigger and construction of Monostable multivibrator.
9. Op-amp - Design of active filters - second order - low pass, high pass, band pass and band reject.
10. Op-amp – 4 bit D/A converter - Binary weighted method and R-2R ladder method.
11. Arithmetic operations (Adder/ Subtractor) Using IC 7483.
12. Study of (i) Multiplexer using IC 74150 for the generation of Boolean functions and (ii) Demultiplexer using IC 74154
13. IC 7490 -as modulus counters and display using IC-7447
14. Up-down counters - Design of modulus counters.
15. IC 7476 - 4 bit Shift Register - Ring counter and Johnson counters.
16. IC 555 - Astable multivibrator and Voltage Controlled Oscillator.
17. IC 555 - Monostable multivibrator, Frequency Divider.
18. IC 555 - Schmitt Trigger and Hysteresis.
19. Temperature co-efficient of resistance using 555 timer.
20. Instrumentation Amplifier - using IC 741.
21. Pulse width modulator using IC 741.
22. A/D converter using comparator LM 339.
23. Phase Locked Loop.
24. Study of arithmetic and logical operations using IC74181
25. Study of A/D converters – 4 bit simultaneous A/D converter and successive approximation A/D converter using ADC IC 0801/IC 0804.

**ELECTIVE
PAPER-2
(to choose 1 out of 3)**

A. NANO SCIENCE

UNIT -I: NANOSCALE SYSTEMS

Introduction to Nanoscale – Size-Dependent properties - Size effect - surface tension, wettability - specific surface area and surface area to volume ratio – Reason for change in optical properties, electrical properties and mechanical properties – nanoscale catalysis - Principles of Top-Down and Bottom-Up approaches.

UNIT –II: SYNTHESIS OF NANOSTRUCTURE MATERIALS

Gas phase condensation – Vacuum deposition -Physical vapor deposition (PVD) - chemical vapor deposition (CVD) - Sol-Gel- Ball milling –spray pyrolysis – plasma based synthesis process (PSP) - hydrothermal synthesis - Etching technologies: wet and dry etching - photolithography – Drawbacks of optical lithography for nanofabrication - electron beam lithography – ion beam lithography - dip-pen nanolithography.

UNIT –III: QUANTUM DOTS

Quantum confinement - Excitons and excitonic Bohr radius – difference between nanoparticles and quantum dots - Preparation through colloidal methods - Epitaxial methods- MOCVD and MBE growth of quantum dots - current-voltage characteristics - magneto tunneling measurements - Absorption and emission spectra of quantum dots - photo luminescence spectrum.

UNIT IV: CHARACTERIZATION:

Nano SEM - Scanning Conducting microscopy (SCM) - High-resolution Transmission Electron Microscopy (HRTEM) - single nanoparticle characterization –Scanning capacitance microscopy. Principle and working of Atomic Force Microscopy (AFM) and Scanning tunneling microscopy (STM) – Principle of Transmission Electron Microscopy (TEM) – applications to nanostructures – nanomechanical characterization – nanoindentation.

UNIT V: APPLICATIONS OF NANOTECHNOLOGY:

Nanodiodes, Nanoswitches, molecular switches, Nano-logic elements - Single electron transistors - small metallic tunnel junctions - nanoparticles based solar cells and quantum dots based white LEDs – CNT based transistors –Surface acoustic wave (SAW) devices, microwave MEMS, field emission display devices, - Super hard nanocomposite coatings and applications in tooling - Biochemistry and medical applications: lab-on-a-chip systems. Nanoboats –nanosubmarines - DNA engineering.

Books for study:

1. S. Shanmugam, Nanotechnology TBH Edition.
2. T. Pradde, Nano- the essential, McGraw Hill Education, Chennai.
3. De Jongh J, Physics and Chemistry of Metal cluster components, Kluwer Academic Publishers, Dordrecht, 1994.
4. Kenneth J. Klabunde, Nanoscale Materials in Chemistry, Wiley & Sons, Publcn, 2001.
5. Dexler E, Nanosystems, John Wiley, CNY, 1992.
6. Sulabha K. Kulkarni, Nanotechnology: Principles and Practices, Capital Publishing Company.
7. M.A. Shah, Principles of Nanoscience and Nanotechnology, Tokeer Ahmad.

Books for references:

1. Nanotechnology, AIP Press, Springer-Verlag, Gregory Timp editor, New York, , 1999.
2. N. John Dinardo, Nanoscale characterization of surfaces & interfaces, 2nd Edition, Weinheim Cambridge: Wiley-VCH, 2000
3. Jan Korvink & Andreas Greiner, Semiconductors for micro and nanotechnology- An introduction for engineers, Weinheim Cambridge: Wiley-VCH, 2001.
4. W. Kamliu et. al Nanomaterials and mechanics, John Wiley.
5. Hand Book of Nanoscience, Engineering and Technology – The Electrical Engineering handbook series.

PAPER-2

B. FIBRE OPTICS

Unit I: Linear, nonlinear waves and Maxwell's equations

Simple pendulum – small and large oscillations – Duffing oscillator – Linear and nonlinear medium - Maxwell's equations – Electromagnetic waves phase and group velocity, modes in a planar and cylindrical wave guides – polarization - dielectric susceptibility – first and higher order susceptibilities.

Unit II: Optical fiber waveguides and sources

Ray theory transmission: Total internal reflection, acceptance angle, numerical aperture and skew rays – evanescent field and Goos-Haechen shift – step index and graded index fibers – single and multi-mode fibers.

Sources: LED - Lasers – mode locked Lasers - modulation capability- transient response -semiconductor losses - diode structure and threshold conditions – modulation – temperature effects – source linearity and reliability – Photo detectors – PIN Photo detector – avalanche photodiode.

Unit III: Transmission characteristics of optical fibers

Attenuation – material absorption losses in silica fibers – linear and nonlinear scattering losses – fiber bend loss – mid-infrared and far-infrared transmission – intramodal and intermodal dispersion – overall fiber dispersion in multimode and single-mode fibers – modal birefringence.

Unit IV: Fabrication and connection of optical fibers

Glass fibers - Preparation of optical fibers – Liquid-phase (melting) and Vapour-phase deposition techniques – characteristics of single-mode, multimode, plastic-clad and all-plastic fibers - Stability of the Fiber Transmission Characteristics: Micro bending and hydrogen absorption – fiber alignment and joint loss – fiber splices – Fiber connectors: cylindrical ferrule expanded beam connectors - Fiber couplers: Three and four port couplers - star couplers.

Unit V: Nonlinear effects in fiber and solitons in optical fiber communication

Refractive index – frequency and intensity dependent refractive index – group velocity dispersion – self-phase modulation - Kerr effect – chirping - stimulated Raman scattering – stimulated Brillouin scattering – self-steepening – self-focusing – self-defocusing –

concept of solitons – formation of solitons – kdV equation - Nonlinear Schrödinger equation for solitons – soliton switching – soliton laser- advantages of soliton based communication.

Books for study:

1. Ajoy Ghatak and K. Thyagarajan, Introduction to fiber optics, 6th Edition, Cambridge University press, 2006.
2. John M. Senior, Optical fiber communications: Principles and practice, 2nd edition , PHI.
3. Govind P. Agrawal, Fiber-Optic communication systems, John Wiley, 2003.
4. Waves called solitons: concepts and experiments, Springer Verlag, 1992.
5. Gerd Keiser, Optical fiber communications, 5th edition, McGra-Hill Education Pvt. Ltd., New Delhi, 2013.

Books for reference:

1. B.B. Laud, Lasers and Non-Linear optics, New Age International, New Delhi.
2. Akira Hasegawa and Yujiodama, Solitons in optical communications, oxford Press, 1995.
3. Robert W Boyd, Nonlinear fiber optics, 2nd Edition, Elsevier, 2006.

PAPER-2

C. NON LINEAR OPTICS

Unit I: Lasers

Gas lasers – He-Ne, Ar + ion lasers – Solid state lasers – Ruby – Nd: YAG, Ti Sapphire – Organic dye laser – Rhodamine – Semiconductor lasers – Diode laser, p-n-junction laser, GaAs Laser.

Unit II: Introduction to Nonlinear Optics

Refractive index – frequency dependent and intensity dependent refractive index - Wave propagation in an anisotropic crystal – Polarization response of materials to light – Second harmonic generation – Sum and difference frequency generation – Phase matching – four wave mixing - Third harmonic generation – self focusing – Parametric amplification – bistability.

Unit III: Multiphoton Processes

Two photon process – Theory and experiment – Three photon process parametric generation of light – Oscillator – Amplifier – Stimulated Raman scattering – Intensity dependent refractive index optical Kerr effect – photorefractive, electron optic effects.

Unit IV: Nonlinear Optical Materials

Basic requirements – Inorganics – Borates – Organics – Urea, Nitro aniline – Semi organics – Thiourea complex – X-ray diffraction, FTIR and FT-NMR qualitative study – Kurtz test – Laser induced surface damage threshold.

Unit V: Fiber Optics

Step – Graded index fibers – wave propagation – Fiber modes – Single and multimode fibres – Numerical aperture – Dispersion – Fiber bandwidth – Fiber loss – Attenuation coefficient – Material absorption-Bending Losses, inverse square law losses-core and cladding losses.

Books for study:

1. Subir kumar Sarkar, Optical fibers and fiber Optic communication system, S. Chand & company Ltd, New Delhi.
2. D.L. Mills, Nonlinear Optics – Basic Concepts Springer, Berlin, 1998.

Books for Reference

1. B.B. Laud, Lasers and Nonlinear Optics, 2nd Edition, New Age International (P) Ltd., New Delhi, 1991.
2. Robert W. Boyd, Nonlinear Optics, 2nd Edition, Academic Press, New York, 2003
3. Govind P. Agarwal, Fiber-Optics Communication Systems, 3rd Edition, John Wiley & Sons, Singapore, 2003.
4. William T. Silvast, Laser Fundamentals, Cambridge University Press, Cambridge 2003.

SEMESTER III
PAPER-7
SPECTROSCOPY

UNIT-I: Microwave spectroscopy

Pure rotational spectra of diatomic molecules - Polyatomic molecules - Study of linear molecules and symmetric top molecules - Hyperfine structure and quadruple moment of linear molecules - Experimental techniques - Molecular structure determination - Stark effect - inversion spectrum of ammonia - Applications to chemical analysis.

UNIT-II: Infrared spectroscopy

Vibrational spectroscopy of diatomic and simple polyatomic molecules - Harmonic Oscillator - Anharmonic Oscillator - Rotational vibrators - Normal modes of vibration of Polyatomic molecules - Experimental techniques - Applications of infrared spectroscopy - H_2O and N_2O molecules - Reflectance spectroscopy.

UNIT-III: Raman Spectroscopy

Classical theory of Raman Scattering - Raman effect and molecular structure - Raman effect and crystal structure - Raman effect in relation to inorganic, organic and physical chemistry - Experimental techniques - Coherent anti-Stokes Raman Spectroscopy - Applications of infrared and Raman spectroscopy in molecular structural confirmation of water and CO_2 molecules - Laser Raman Spectroscopy.

UNIT-IV: NMR and NQR Spectroscopy

Theory of NMR - Bloch equations - Steady state solution of Bloch equations - Theory of chemical shifts - Experimental methods - Single Coil and double coil methods - Pulse Method - High resolution method - Applications of NMR to quantitative measurements. Quadruple Hamiltonian of NQR - Nuclear quadruple energy levels for axial and non-axial symmetry - Experimental techniques and applications.

UNIT-V: ESR and Mossbauer Spectroscopy

Quantum mechanical treatment of ESR - Nuclear interaction and hyperfine structure - Relaxation effects - Basic principles of spectrographs - Applications of ESR method - Mossbauer Effect - Recoilless emission and absorption - Mossbauer spectrum - Experimental methods - Mossbauer spectrometer - Hyperfine interactions - Isomer shift - Magnetic hyperfine interactions - Electric quadruple interactions - Simple biological applications.

Books for Study:

1. C.N. Banwell, E.M. Mc Cash, Fundamentals of Molecular Spectroscopy, 4th Edition, Tata McGraw-Hill Publications, New Delhi, 1994.
2. G. Aruldas, Molecular Structure and Spectroscopy, Prentice - Hall of India Pvt.Ltd., New Delhi, 2001.
3. D.N. Satyanarayana, Vibrational Spectroscopy and Applications, New Age International Publications, New Delhi, 2004.
4. Raymond Chang, Basic Principles of Spectroscopy, Mc Graw-Hill Kogakusha, 1980.

Books for Reference:

1. Straughn and Walker, Spectroscopy, Vol I &II Chapman and Hall, 1967.
2. Atta Ur Rahman, Nuclear Magnetic Resonance, Spinger Verlag, New York, 1986.
3. Towne and Schawlow, Microwave Spectroscopy, McGraw-Hill, New York, 1995.
4. Raymond Chang, Basic Principles of Spectroscopy, Mc Graw-Hill, Kogakusha, Tokyo, 1980.
5. D.A. Lang, Raman Spectroscopy, Mc Graw-Hill International, New York.
6. John Ferraro, Introductory Raman Spectroscopy, Academic Press, New York, 2008.
7. Raj kumar, Atomic and Molecular Spectra: Laser, Kedar Nath Ram Nath, Meerut, New Delhi, 2015.

PAPER-8

NUCLEAR AND PARTICLE PHYSICS

UNIT I: Nuclear Interactions

Nuclear forces – Exchange forces - Two body problem – Ground state of deuteron - Magnetic moment – Quadrupole moment - Tensor forces – Nucleon – Nucleon interaction – Meson theory of nuclear forces – Nucleon-Nucleon scattering – Effective range theory – Spin dependence of nuclear forces – Charge independence and charge symmetry of nuclear forces – Isospin formalism.

UNIT II: Nuclear Reactions

Types of reactions and conservation laws – Energetics of nuclear reactions – Dynamics of nuclear reactions – Q-value equation – Scattering and reaction cross sections – Compound nucleus reactions – Direct reactions – Resonance scattering – Breit-Wigner one level formula.

UNIT III: Nuclear Models

Liquid drop model – Bohr-Wheeler theory of fission – Experimental evidence for shell effects – Shell model – Spin-orbit coupling - Magic numbers – Angular momenta and parities of nuclear ground states – Qualitative discussion and estimate of transition rates – Magnetic moments and Schmidt lines – Collective model of Bohr and Mottelson.

UNIT IV: Nuclear Decay

Beta decay – Fermi theory of beta decay – Shape of the beta spectrum – Total decay rate - Mass of the neutrino – Angular momentum and parity selection rules – Allowed and forbidden decays – Comparative half-lives – Neutrino physics – Non-conservation of parity – Gamma decay – Multipole transitions in nuclei – Angular momentum and parity selection rules – Internal conversion – Nuclear isomerism.

UNIT V: Elementary Particle Physics

Types of interaction between elementary particles – Hadrons and leptons – Symmetries and conservation laws – Elementary ideas of CP and CPT invariance – Classification of hadrons – SU(2) and SU(3) multiplets – Gell-Mann-Okubo mass formula for octet and decuplet hadrons – Quark model- Types of quarks.

Books for study:

1. K. S. Krane, Introductory Nuclear Physics, Wiley, New York, 1987.
2. D. Griffiths, Introduction to Elementary Particle Physics, Harper & Row, New York, 1987.
3. R. R. Roy and B.P. Nigam, Nuclear Physics, New age Intl. New Delhi, 1983.
4. M.L. Pandya and R.P.S. Yadav, Elements of Nuclear Physics 7th Edition, Kedar Nath Ram Nath, Delhi, 1995.
5. D.C. Tayal, Nuclear Physics, 5th Edition, Himalaya Publishing House, Bombay, 1997.
6. R. C. Sharma, Nuclear physics, Kedar Nath & Co, Meerut.

Books for reference:

1. H. A. Enge, Introduction to Nuclear Physics, Addison-Wesley, Tokyo, 1983.
2. Y. R. Waghmare, Introductory Nuclear, Physics, Oxford-IBH, New Delhi, 1981.
3. Ghoshal, Atomic and Nuclear Physics, Vol. 2
4. J. M. Longo, Elementary particles, McGraw-Hill, New York, 1971.
5. R. D. Evans, Atomic Nucleus, McGraw-Hill, New York, 1955.
6. I. Kaplan, Nuclear Physics, Narosa, New Delhi, 1989.
7. B. L. Cohen, Concepts of Nuclear Physics, TMH, New Delhi, 1971.
8. M. K. Pal, Theory of Nuclear Structure, Affl. East-West, Chennai, 1982.
9. W. E. Burcham, M. Jobes, Nuclear and Particle Physics, Addison-Wesley, Tokyo, 1995.

PAPER-9

MICROPROCESSOR AND MICROCONTROLLER

UNIT-I: 8085 Architecture and Programming

8085 Architecture - Programmer's model - ALU - Registers and Flags - Stacks - Complete instruction set of Intel 8085 - State transition and timing diagrams - T States - Machine cycles - Instruction cycles - Timing diagram for memory read and memory write cycles - Addressing modes - Maskable and Non-maskable Interrupts - Assembly language programs – time delay subroutines and delay calculations.

UNIT-II: Interfacing Memory and I/O devices

Interfacing memory and devices – I/O and Memory mapped I/O – Simple polled I/O and Handshaking operations - Programmable keyboard / display interface 8279 - Programmable peripheral device 8255A - 8253 Timer Interface – DAC and ADC interface - Wave form generation (Sine, square, triangular and ramp wave) - Programmable communication interface 8251 (USART).

UNIT-III: Microcontroller 8051

Introduction – 8 and 16 bit Microcontroller families –Flash series – Embedded RISC Processor – 8051 Microcontroller Hardware – Internal registers – Addressing modes – Assembly Language Programming – Arithmetic, Logic, Sorting operations and BCD to binary and binary to BCD conversion.

UNIT IV: Interfacing I/O and Memory With 8051

Interfacing I/O Ports, External memory, counters and Timers - Serial data input/output, Interrupts – Interfacing 8051 with ADC, DAC, LED display, Keyboard, Sensors and Stepper motor.

UNIT V: Embedded Microcontroller

Embedded microcontroller system – types of embedded operating system – Micro chip PIC 16C6X /7X family – features – Architecture – Memory Organization – Register file map – I/O ports – Data and flash program memory – asynchronous serial port – Applications in communication and industrial controls.

Books for Study

1. R.S. Gaonkar, Microprocessor Architecture, programming and Application with the 8085, 3rd Edition, Penram International Publishing, Mumbai, 1997.
2. V.Vijayendran, Fundamentals of Microprocessor 8085 - Architecture, programming and interfacing, Viswanathan Publication, Chennai, 2002.
3. Kenneth J. Ayala – The 8051 Micro Controller Architecture, Programming and Applications. 3rd Edition , Penram International
4. John B. Peatman, Design with PIC Microcontrollers, 7th Indian reprint, Pearson Education, 2004.
5. K. V. Shibu, Introduction to Embedded System, Tata Mc Graw-Hill Education Private Limited , New Delhi.
6. Raj Kumar, Embedded System, Tata Mc Graw-Hill Education Private Limited, New Delhi.

Books for Reference

1. B. Ram, Fundamentals of Microprocessors and Microcomputers, Dhanpat Rai publications, New Delhi.
2. R. Thiagarajan, S. Dhanasekaran, S.Dhanapal, Microprocessor and its applications, New Age International, New Delhi.
3. Muhammed Ali Mazidi, Janice Gillespie Mazidi, The 8051 Microcontroller and Embedded Systems, Fourth Indian Reprint, Pearson Education , 2004.
4. Raj Kamal, Introduction to Embedded Systems, TMS, 2002.

ELECTIVE

PAPER-3

(to choose 1 out of 3)

A. CRYSTAL GROWTH AND THIN FILMS

UNIT I: Nucleation and Growth

Nucleation – Different kinds of nucleation - Concept of formation of critical nucleus – Classical theory of nucleation - Spherical and cylindrical nucleus - Growth Kinetics of Thin Films – Thin Film Structure.

UNIT II: Growth Techniques

Solution Growth Technique: Low temperature solution growth: Solution - Solubility and super solubility – Expression of super saturation – Miers T-C diagram - Slow cooling and solvent evaporation methods - Constant temperature bath and crystallizer – Seed preparation and mounting.

Gel Growth Technique: Principle – Various types – Structure of gel – Liesegang rings - Importance of gel – Experimental procedure –Chemical reaction method – Single and double diffusion method — Advantages and disadvantages of gel method.

UNIT III: Melt Growth Techniques

Melt technique: Bridgman technique - Basic process – Various crucibles design - Thermal consideration –Vertical Bridgman technique –Crystal Pulling technique - Czochralski technique – Experimental arrangement – Growth process –Zone melting technique –Skull melting process –Verneuil Process.

UNIT IV: Thin Film Deposition Techniques

Thin Films – Introduction to Vacuum Technology - Deposition Techniques - Physical Vapour Deposition: Resistive Heating, Electron gun, Laser gun Evaporation and Flash Evaporations, Sputtering – D.C. Reactive Sputtering, RF Sputtering - Chemical vapour deposition (CVD): Spray Pyrolysis -- Preparation of Transparent Conducting Oxides.

UNIT V: Characterization Technique

X – Ray Diffraction (XRD) – Powder and single crystal - Fourier transform Infrared analysis (FT-IR) – Elemental analysis:Energy dispersive X-ray analysis (EDAX) – Scanning Electron Microscopy (SEM) – UV-Vis-NIR Spectroscopy – Etching (Chemical) – Vicker's Micro hardness –Dielectric studies – Second harmonic generation test.

Books for Study and Reference:

1. J.C. Brice, Crystal Growth Processes, John Wiley and Sons, New York, 1986.
2. P. SanthanaRagavan and P. Ramasamy, Crystal Growth Processes and Methods, KRU Publications, Kumbakonam, 2001.
3. A. Goswami, Thin Film Fundamentals, New Age International (P) Limited, New Delhi, 1996.
4. H.H. Willard, L.L. Merritt, J.A. Dean, F.A. Settle, CBS, Publishers and Distributors, New Delhi.
5. Douglas A. Skoog, James J. Leary, Principles of Instrumental Analysis, 4th Edition, Harcourt Brace College Publishers, New York, 1992.
6. B.D.Cullity, Elements of X-Ray Diffraction, 2nd Edition, Addison-Wesley Publishing Company, California, 1978.
7. Heniz K.Henisch, Crysals in Gels and Liesegang Rings, Cambridge University Press, Cambridge, 1988.
8. Anthony R.West, Solid State Chemistry and its Applications, John Wiley & Sons, NewYork, 2003.

PAPER 3

B. ADVANCED SPECTROSCOPY

UNIT I: UV Spectroscopy

Energy levels, Molecular orbitals – Theory of UV spectra – Franck Condon Principle – transition Probability, measurement of spectrum – Types of transition in Organic molecules – Types of absorption bands – transition in metal complexes – Selection rules – Electronic spectra in poly atomic molecules – Chromophore concept – Application of UV Spectroscopy.

UNIT II: Atomic absorption and Emission Spectroscopy

Atomic Absorption Spectroscopy (AAS): Principle of AAS– single beam Spectrophotometer –Applications of AAS - Atomic emission Spectroscopy – Principle of AES, Advantages - Instrumentation– Applications of AES –Difference between AAS and AES.

UNIT III: Surface Enhanced Raman Scattering (SERS) and FT Raman Spectroscopy

Surfaces for SERS study – Enhancement mechanism – Instrumentation and sampling techniques - Surface selection rules – SERS microprobe – SERS study of bio molecules – SERS in medicine –Use of Laser FT Raman Spectroscopy: Principle, Instrument, sample handling methods and applications.

UNIT IV: Surface Spectroscopy

Electron energy loss spectroscopy (EELS) – Reflectance Absorbance – IR spectroscopy (RAIRS) – Inelastic helium scattering – Photo electron spectroscopy (PES) – X ray photo electron spectroscopy (XPES).

UNIT V: Nonlinear Spectroscopic Phenomena

Nonlinear Raman phenomena – Hyper Raman effect – Experimental Technique – Stimulated Raman scattering – Inverse Raman effect – Photo acoustic Raman scattering – Multiphoton spectroscopy.

Books for study

1. N. Banwell and E. M. McCash, Fundamentals of Molecular Spectroscopy, 4th Edition, Tata Mc Graw-Hill, New Delhi, 1994.
2. G. Aruldas, Molecular structure and spectroscopy, Prentice Hall of India Pvt. Ltd., New Delhi, 2001.
3. H.Kaur, Spectroscopy, 5th Edition, A Pragati Prakashan, 2009.
4. P. S. Sindhu, Molecular Spectroscopy, Tata Mc Graw-Hill, New Delhi, 1990.
5. D.N. Sathyanarayana, Vibrational Spectroscopy, New age International Publishers.

Books for Reference:

1. G. W. King, Spectroscopy and molecular structure, Hoit Rinchart and Winsten Inc, London, 1964.
2. T. A. Carlson, Photo electron and Auger spectroscopy, Plenum Press, 1975.
3. J. Loder, Basic Laser Raman spectroscopy, Hezdan and Son Ltd. , 1970.
4. T. P. Das, E. L. Hehn, NQR Spectroscopy, Academic Press, 1958.
5. Raymond Chang, Basic Principles of Spectroscopy Mc Graw-Hill Kogakusha, 1980.
6. Douglas A. Skoog, James J.Leary, Principles of Instrumental Analysis, 4th Edition, Harcourt Brace College Publishers, New York,1992.
7. Anthony R.West, Solid State Chemistry and its Applications, John Wiley & Sons, New York, 2003.
8. K.P. Rajappan Nair, Atomic spectroscopy MJP publication, Chennai.

PAPER-3

B. ADVANCED NUCLEAR PHYSICS

UNIT-I: Methods of investigating nuclear size

Classification of nuclei, nuclear size - methods to investigate nuclear size - Mesonic X-rays, Electron scattering, Coulomb energies of mirror nuclei, neutron scattering methods

UNIT-II: Discovery and Properties of neutron

Discovery of neutron, fundamental properties of neutron, neutron sources, - radioactive sources, Photo-neutron sources, accelerated particle sources – Detection of neutrons – General principles, slow neutron detectors by foil activation method, detection of fast neutrons by scintillation counter.

UNIT-III: Classification and interaction of neutron

Classification of neutrons according to energy, Neutron –electron interactions, slowing down of fast neutrons, slowing down time, slowing down density, resonance escape probability, neutron diffusion-solution to diffusion equation, diffusion of fast neutrons-Fermi-age equation

UNIT-IV: Reactor Physics

Condition of criticality of nuclear reactor, the critical equation and buckling, critical reactor dimensions, criticality of large thermal reactors- migration length, the reflector reactor, continuum theory of nuclear reactions, optical model theory of nuclear reactions, photo-nuclear reactions.

UNIT-V: Nuclear fusion: Thermonuclear energy

Nuclear fusion, the fusion reaction, thermonuclear reactions, sources of stellar energy, controlled thermonuclear reactions, the possibility of fusion reactor, cold fusion and transuranic elements.

Books for Study and Reference:

1. Robley D. Evans, The atomic nucleus, TMH, New Delhi, 1982.
2. M.L.Pandya, R.P.S Yadhav, Kedharnath, Ramnath, Elements of nuclear Physics, Meerut, 1995.
3. Irving Kaplan, Nuclear Physics, Narosha Publshers, New Delhi, 1989.
4. V. Devanathan, Nuclear Physics, Narosa Publishing House , New Delhi.
5. A.B Gupta, Modern Atomic and Nuclear Physics, Books and Allied Limited, Kolkata.

SEMESTER IV

PAPER-10

MATERIALS SCIENCE AND LASER PHYSICS

UNIT-I: Defects and dislocations

Point defects - Schottky and Frenkel defects - number of defects as a function of temperature - Diffusion in metals - Diffusion and ionic conductivity in ionic crystals - Dislocations - Edge and screw dislocations - Burgers vector - Plastic deformation - Slip - Motion of dislocations under uniform shear stress - Stress fields around dislocations - Density - Work hardening function- Effect of grain size on dislocation motion - Effect of solute atoms on dislocation motion.

UNIT-II: Optical Properties, Dielectric Properties and Ferro Electrics

Color centers - Photo conductivity - electronic transitions in photo conductors - Trap, Capture, recombination centers - General mechanism - Luminescence - Excitation and emission - Internal electric field in a dielectric - Clausius-Mossotti and Lorentz - Lorenz equations - Dielectric dispersion and loss - Ferroelectrics - Ferro electricity - General properties - Dipole theory - Ionic displacements and the behaviors of BaTiO_3 .

UNIT-III: Elastic Behaviour, Polymer and Ceramics

Anelastic and visco elastic behaviour - Atomic model of elastic behaviour - rubber like elasticity - Anelastic deformation - Relaxation process - Model for visco elastic behaviour - Polymers - Polymerization mechanism - Polymer structures - Deformation of polymers - Behaviour of polymers. Ceramics: Ceramic phases - Structure - classes - Effect of structure on the behaviour of ceramic phases - composites.

UNIT-IV: Nano Material and Its Applications

Classification of Nanomaterials – Synthesis – Ball milling, Solgel and CVD methods – metal and semiconductor nanoparticles by colloidal route – microorganism method – Analytical methods: STM- TEM – Electrical, Magnetic and optical properties of nanoparticles – Applications Optoelectronic device– LED – Colourants and pigments – Nano biotechnology – DNA chips – DNA array devices – Drug delivery systems.

UNIT-V: Laser Physics

Introduction - Interaction of radiation - with matter - Spontaneous and stimulated emission - Conditions for oscillation - Frequency of oscillation of the system - Einstein co-efficient - Possibility of amplification - Population inversion - Laser pumping Rate equations - Three level and four level system - Optical resonator - Types and modes of resonator - Oscillation - Threshold condition. The confocal resonant cavity - theory - Spot size and beam divergence - quality factor (Q) of an optical cavity.

Books for Study:

1. G.K. Narula, K.S. Narula, and V.K. Gupta, Material Science, TMH, New Delhi, 1995.
2. A.J. Dekker, Solid State Physics, McMillan Co., 1981.
3. V.Ragavan, Material Science and Engineering, 4th Edition, Prentice Hall of India, New Delhi, 2003.
4. M. Arumugam, Materials Science, 3rd Edition, Anuradha Agencies, 2002.
5. Allen, Jones, Principles of Gas lasers, Butterworths, London, 1967.
6. K.R. Nambiar, Laser Principles, types and Application, New Age International, 2004.
7. K. Thyagarajan, A.K. Ghatak, Laser Theory and Applications, Macmillan India Ltd., 1997.

Books for Reference:

1. Lawrence H. Vlack, Elements of Materials Science and Engineering, 6th Edition, Second ISE reprint, Addison-Wesley, 1998.
2. H. Iabch, H. Luth, Solid State Physics, An introduction to principles of Material Science, 2nd Edition, Springer, 2001.
3. B.B. Laud, Lasers and Non linear optics, Wiley Eastern Ltd., 1991.
4. J.J. Verdayan, Laser Electronics, Prentice-Hall India, New Delhi, 1993.

PAPER-11

CONDENSED MATTER PHYSICS

UNIT-1 Crystal Physics

Types of lattices - Miller indices – symmetry elements and allowed rotations - simple crystal structures – Atomic packing factor - Crystal diffraction - Bragg's law –Scattered wave amplitude - Reciprocal lattice (sc, bcc, fcc) – Diffraction conditions - Laue equations – Brillouin Zone - Structure factor - Atomic form factor - Inert gas crystals - Cohesive energy of ionic crystals - Madelung constant - Types of crystal binding(general ideas).

UNIT-II: Lattice dynamics

Monoatomic lattices - Lattice with two atoms per primitive cell - First Brillouin zone - Group and phase velocities - Quantization of lattice vibrations - Phonon momentum - Inelastic scattering by phonons - Einstein's model and Debye's model of specific heat - thermal expansion - Thermal conductivity - Umklapp processes.

UNIT-III: Theory of metals and semiconductors

Free electron gas in three dimensions - Electronic heat capacity - Wiedmann-Franz law - Band theory of metals and semiconductors - Bloch theorem - Kronig-Penny model - Semiconductors - Intrinsic carrier concentration – Temperature dependence - Mobility - Impurity conductivity – Impurity states - Hall effect -Fermi surfaces and construction - Experimental methods in Fermi surface studies - de Haas Van Alphen effect.

UNIT-IV: Magnetism

Diamagnetism - quantum theory of Paramagnetism - Rare earth ion - Hund's rule - Quenching of orbital angular momentum - Adiabatic demagnetization - Quantum theory of ferromagnetism - Curie point - Exchange integral - Heisenberg's interpretation of Weiss field - ferromagnetic domains - Bloch Wall - Spin waves - Quantization - Magnons - thermal excitation of magnons - Curie temperature and susceptibility of ferrimagnets - Theory of anti ferromagnetism - Neel temperature.

UNIT-V: Super conductivity

Experimental facts: Occurrence - Effect of magnetic fields - Meissner effect – Critical field – Critical current - Entropy and heat capacity - Isotope effect - Energy gap - Type I and Type II superconductors. Theoretical explanation: Thermodynamics of super conducting transition - London equation - BCS Theory - Coherence length – Cooper pairs - Single particle Tunneling - Josephson tunneling - DC and AC Josephson effects - High temperature super conductors - SQUIDS.

Books for Study:

1. C. Kittel, Introduction to Solid State Physics, 7th Edition, Wiley, New York, 1996.
2. M. Ali Omar, Elementary Solid State Physics-Principles and Applications, Addison-Wesley, London, 1974.
3. H.P. Myers, Introductory Solid State Physics, 2nd Edition, Viva Book, New Delhi, 1998.
4. S.O. Pillai, Solid State Physics, New Age International, New Delhi, 1997.

Books for Reference:

1. N.W. Aschcroft, N.D. Mermin, Solid State Physics, Rhinehart and Winton, New York.
2. J.S. Blakemore, Solid State Physics, 2nd Edition, W.B. Saunder, Philadelphia, 1974.
3. A.J. Dekker, Solid State Physics, Macmillan India, New Delhi.
4. H.M. Rosenberg, The Solid State, 3rd Edition, Oxford University Press, Oxford, 1993.
5. S.O. Pillai, Problems and Solutions in Solid State Physics, New Age International, New Delhi, 1994.
6. S.L. Altmann, Band Theory of Metals, Pergamon, Oxford.
7. M.A. Wahab, Solid State Physics, Structure and Properties of Materials, Narosa, New Delhi, 1999.
8. J.M. Ziman, Principles of the Theory of Solids, Cambridge University Press, London, 1971.

PAPER-12
PROJECT WITH VIVA VOCE

Preamble

The concept of introducing the project will help the student community to learn and apply the principles of Physics and explore the new research avenues.

In the course of the project the student will refer books, Journals or collect literature / data by the way of visiting research institutes/ industries. He/she may even do experimental /theoretical work in his/her college and submit a dissertation report with a minimum of 40 pages not exceeding 50 pages.

Format for Preparation of Dissertation

The sequence in which the dissertation should be arranged and bound should be as follows

1. Cover Page and title Page
2. Declaration
3. Certificate
4. Abstract (not exceeding one page)
5. Acknowledgement (not exceeding one page)
6. Contents (12 Font size, Times new Roman with double line spacing)
7. List of Figures/ Exhibits/Charts
8. List of tables
9. Symbols and notations
10. Chapters
11. References

Distribution of marks for Dissertation (100 Marks)

- | | |
|---|------------|
| (a) For Organization and presentation of Thesis | - 60 marks |
| (b) For the novelty /Social relevance | -10 marks |
| (c) Presentation of work /Participation in state/ | |
| (d) national level Seminar/publication | - 5 marks |
| (e) Viva voce (Preparation, Presentation of | |
| work and Response to questions) | - 25 marks |

MAIN PRACTICAL
PAPER-3
ADVANCED GENERAL EXPERIMENTS

(Any 15 out of the given 20)

1. G.M. Counter - characteristics, Inverse square law.
2. G.M. Counter - Absorption co-efficient.
3. Michelson Interferometer -Wavelength and separation of wavelengths.
4. Michelson Interferometer - Thickness of mica sheet.
5. F.P. Etalon - using Michelson set up.
6. Hall Effect.
7. Molecular Spectra - AIO Band.
8. Molecular Spectra - CN Band.
9. Susceptibility of a liquid by Quinke's method.
10. Susceptibility of a liquid by Guoy's method.
11. Ultrasonic Diffraction - Velocity and Compressibility of a liquid.
12. Ultrasonic Interferometer - Velocity and Compressibility of a liquid.
13. B-H curve using CRO.
14. Spectral analysis of a salt.
15. Absorption Spectra.
16. Laser beam - Interference Experiments
 - (a) Using an optically plane glass plate.
 - (b) Using Lloyd's single mirror method.
17. Laser beam – Diffraction Experiments.
 - (a) Diffraction at straight edge.
 - (b) Diffraction at a straight wire.
 - (c) Diffraction at a circular aperture.
18. Microwave experiment.
19. Determination of Planck's constant.
20. Spectrophotometer - Beer's law verification and absorption co-efficient.

MAIN PRACTICAL

PAPER-4

Microprocessor, Microcontroller and C Programming

(Any 20 out of the given 30)

Microprocessor 8085 programs

1. Number conversion - 8 bit and 16 bit: BCD to Binary, Binary to BCD, Hex to ASCII.
2. Square and square root of BCD and HEX numbers (both 8 and 16 bit).
3. Time delay subroutine and a clock programme.
4. Sum of simple series and arithmetic progression.
5. Interfacing (i) Op-amp 8 bit DAC R-2R network (ii) Switching an array of LEDs.
6. ADC and interfacing IC 0809 with MPU
7. Interfacing and programming IC 0800 with MPU – Unipolar and Bipolar.
8. Wave form generation – sine wave, square wave, triangular and ramp wave.
9. Analog to digital conversion using a DAC Comparator and MPU system.
10. Interfacing a DC stepper motor to the MPU system - clockwise and anticlockwise – full Stepping and half stepping
11. Parallel and Serial communication between two microprocessor systems.
12. Interfacing a HEX keyboard to the MPU system through I/O ports.

Microprocessor 8086 programs using MASM

13. Addition, subtraction
14. Multiplication and division.
15. Multibyte addition/ Subtraction
16. Computation of LCM
17. Sorting in ascending/ descending order.
18. Factorial of a number

Microcontroller 8051 experiments

19. Addition, Subtraction
20. Multiplication and Division.
21. Block transfer
22. BCD to Binary conversion and binary to BCD
23. Sorting in ascending and descending order.
24. LED interface and Stepper motor interface.

Computation methods – C programming

25. Lagrange interpolation with algorithm, flow chart, program and its output
26. Numerical integration by Simpson's rule with algorithm and flowchart, program and its output.
27. Numerical solution of ordinary first order differential equation -Euler's method with algorithm, flowchart, program and its output.
28. Numerical solution of ordinary first order differential equations by the Runge-Kutta IV method, with algorithm, flow chart, program and its output.
29. Curve fitting - Least square fitting with algorithm, flowchart, program and its output.
30. Matrix manipulation - Multiplication Transpose and Inverse with algorithm, Flow chart, program and its output.

ELECTIVE

PAPER-4

A. ADVANCED MICROPROCESSOR

UNIT-I 8086 Architecture and programming

Internal architecture of 8086 - Software model - Internal registers - Minimum mode and Maximum mode system - Instruction set - Addressing modes – Data transfer, Arithmetic, Logical, Shift and rotate instruction – Compare, Jump, Loop, String, Processor control, CALL - RET and stack instructions - Procedures - Assembler Macros - Assembler directives.

UNIT-II Software Programs of 8086

Assembly language Programming – Addition, subtraction and multiplication and division of two 16 bit numbers - Multibyte addition/subtraction – Ascending order – Sum of a series - Computation of LCM - Block transfer – Factorial of a number.

UNIT-III: Memory and Interrupt interface of 8086 Microprocessor

Memory interface - block diagram - Hardware organization of the memory address space - Memory control signals - The stack - Stack segment register and stack pointer - RAM interface - Dynamic RAM interfacing and refreshing - Types of interrupts - Interrupt and address pointer table - Interrupt instructions - Masking of interrupts - External hardware interrupt interface - Interrupt sequence - 8259 Programmable interrupt controller (PIC).

UNIT-IV: 80286, 386 and 486 Microprocessor

Introduction to Intel Processor and its architecture 80286/ 80386 and 80486 microprocessors – block diagram of 386 and 486 - comparison - Pentium Processor –block diagram (Pentium II, III and IV) and its salient features – Multitasking concepts - Operating system concepts and terms - DISK operating system (DOS) - Multitasking and multiprogramming operating system (UNIX).

UNIT-V: Data communication and applications

Centronix parallel interface of printers - Printer concepts - Interfacing ASCII keyboard - Concepts of secondary storage device like floppy disk and Hard disk – PCI bus architecture – AGP - USB - Data Communication methods and standard GPIB – IEEE-488, RS-232C, RS-422 and RS-423A - Temperature controller.

Books for Study:

1. Douglas V. Hall : - Microprocessors and Interfacing programming and Hardware (Tata Mc Graw Hill)
2. W.A. Triebel and Avatar Singh, The 8086 /8088 Microprocessors- Programming, Software, Hardware and application, Prentice Hall of India, New Delhi.
3. Badri Ram, Advanced Microprocessors and interfacing, Tata McGraw Hill, 2006.

Books for Reference:

1. B. Brey, Intel Microprocessors 8086/8088, 80186,80286,80486,80486, Architecture, Programming and Interfacing, 1995.
2. V. Vijayendran, Fundamentals of Microprocessor –8086- Architecture, Programming (MASM) and interfacing, Viswanathan, Chennai, 2002.
3. Yu – Cheng and Glenn A. Gibson, The 8086 / 8088 family Architecture, Programming and Design, Prentice-Hall of India.

PAPER-4

B. PROGRAMMING IN C AND MATLAB

UNIT-I: Data types, managing input and output operations

Basic structure of C programs – Character set – C tokens- Constants– keywords and identifiers – variables – data types - declaration of variables – Assigning values to variables – defining symbolic constants – Reading and writing a character – formatted inputs and outputs.

UNIT-II: Operators, Expressions and Arrays

Arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise special operators –Arithmetic expressions- evaluation of expressions, precedence of arithmetic operators-one dimensional arrays, two dimensional arrays, multi dimensional arrays- declaration and initialization of arrays.

UNIT-III Decision making, Branching and Looping

Simple if, If-else, If-else ladder, switch, go-to statements, While, DO, FOR statements, simple programs using these statements.

UNIT-IV: Functions and Application programs

Programs for finding square root of second degree algebraic equations-matrix addition, multiplication, diagonalisation and inversion-Solution of simultaneous equations- Gauss elimination method, Solution of first order differential equations- Euler's method, runge Kutta IV order method, numerical integration-Simpson's 1/3 rule.

UNIT-V: MATLAB

Basic Computations, Array operations, Solving Algebraic equations in MATLAB- Differentiation, Integration, Limits, sums and products, Taylor's series – Simple x-y plots – Matrices – Determinant, multiplication, transpose – Loops – Branching – Script M-file – Function M-files.

Books for study:

1. E. Balagurusamy, Programming in ANSI C, 4th Edition TMH, New Delhi, 2009.
2. S.S. Sastry, Introductory methods of Numerical analysis, 3rd Edition Prentice, Hall of India, New Delhi, 2003.
3. E. Balagurusamy, Numerical methods, Tata Mc-Graw Hill, New Delhi.
4. Gilat, MATLAB: An introduction with Applications, John Wiley & Sons, Inc 2004.

Books for Reference:

1. MATLAB 7.0 Basics, P. Howard, spring, 2005.
2. <http://www.maths.tamu.edu/~phoward/308/matbasics.pdf>
3. S.S. Kuo, Numerical Methods, and Computer, Addison-Wesley, 1996.
4. W.H. Press, Numerical Recipes in C, 2nd Edition, Cambridge University Press, 1992.

PAPER-4

C. NUMERICAL METHODS AND PROGRAMMING in C

UNIT-I: Errors and the measurements

General formula for errors – Errors of observation and measurement – Empirical formula – Graphical method – Method of averages – Least square fitting – curve fitting – parabola, exponential.

UNIT-II: Numerical solution of algebraic and transcendental equations

The iteration method – The method of false position – Newton-Raphson method – Convergence and rate of convergence – C program for finding roots using Newton – Raphson method - Simultaneous linear algebraic equations - Gauss elimination method – Jordon's modification – Gauss–Seidel method of iteration – C program for solution of linear equations.

UNIT-III: Interpolation

Linear interpolation – Lagrange interpolation Gregory – Newton forward and backward Interpolation formula – Central difference interpolation formula – Gauss forward and backward interpolation formula – Divided differences – Properties – Newton's interpolation formula for unequal intervals – C programming for Lagrange's interpolation.

UNIT-IV: Numerical differentiation and integration

Newton's forward and backward difference formula to compute derivatives – Numerical Integration: the trapezoidal rule, Simpson's rule – Extended Simpson's rule – C program to evaluate integrals using Simpson's and trapezoidal rules.

UNIT-V: Numerical Solutions of ordinary differential equations

Nth order ordinary differential equations – Power series approximation – Pointwise method – Solutions of Taylor series – Euler's method – Improved Euler's method – Runge-Kutta method – second and fourth order – Runge-Kutta IV method for solving first order differential equations – C program for solving ordinary differential equations using Runge-Kutta IV method.

Books for study and Reference:

1. S.S. Sastry, Introductory Methods of Numerical analysis, Prentice, 3rd Edition, Hall of India, New Delhi, 2003.
2. M.K. Venkataraman, Numerical Methods in Science and Engineering, The National Publishing Co. Madras, 2001.
3. E. Balagurusamy, Numerical methods ,Tata Mc Graw Hill, New Delhi, 2008.
4. A. Singaravelu, Numerical Methods, Meenakshi Agency, Chennai.
5. B.P.Flannery, S.A.Teukolsky, W.T. Vetterling, Numerical Recipes in C, W.H. Press, Cambridge University, 1996.
6. K.P.N. Murthy, Monte Carlo : Basics, ISRP, Kalpakkam, 2000.
7. Veerarajan, Numerical Methods in C and C++, S.Chand, New Delhi, 2006.

THIRUVALLUVAR UNIVERSITY

MASTER OF SCIENCE

DEGREE COURSE

M.Sc. ZOOLOGY

UNDER CBCS

(with effect from 2017-2018)

The Course of Study and the Scheme of Examinations

| S. NO | Study Components | | Ins. hrs/ Week | Credit | Title of the paper | Maximum Marks | | |
|-------------|-----------------------------------|---------|----------------|--------|---|---------------|----------|-------|
| | Course Title | | | | | | | |
| SEMESTER I | | | | | | CIA | Uni.Exam | Marks |
| 1 | MAIN | Paper-1 | 5 | 4 | Life and diversity of Invertebrates | 25 | 75 | 100 |
| 2 | MAIN | Paper-2 | 5 | 4 | Life and diversity of Chordates | 25 | 75 | 100 |
| 3 | MAIN | Paper-3 | 5 | 4 | Cell and molecular Biology | 25 | 75 | 100 |
| 3 | MAIN PRACTICAL | Paper 1 | 12 | - | Life and Diversity of Invertebrates Chordates Cell and molecular Biology | - | - | - |
| 4 | ELECTIVE (a)Disciplinary or | Paper-1 | 3 | 3 | (A)Aquaculture and Farm Management (B)Biostatistics and Bioinformatics | 25 | 75 | 100 |
| | Elective (b)inter Disciplinary | | | | | | | |
| | | | 30 | 15 | | 100 | 300 | 400 |
| | | | | | | | | |
| SEMESTER II | | | | | | CIA | Uni.Exam | Marks |
| 5 | MAIN | Paper-4 | 4 | 4 | Genetics | 25 | 75 | 100 |
| 6 | MAIN | Paper-5 | 4 | 4 | Environmental Biology | 25 | 75 | 100 |
| 7 | MAIN | Paper-6 | 4 | 4 | Bio Technology | 25 | 75 | 100 |
| 8 | MAIN PRACTICAL | Paper-1 | - | 5 | Life and Diversity of Invertebrates Chordates and Cell and molecular Biology | 25 | 75 | 100 |

M.Sc. Zoology : Syllabus (CBCS)

| | | | | | | | | |
|--------------|--|--------------|----|----|--|-----|-----|-----|
| 9 | MAIN PRACTICAL | Paper-2 | 10 | 5 | Genetics, Environmental Biology and Biotechnology | 25 | 75 | 100 |
| 10 | ELECTIVE (a)Disciplinary or | Paper-2 | 3 | 3 | (A)Endocrinology (B) Biochemistry | 25 | 75 | 100 |
| | Elective (b)inter Disciplinary | | | | | | | |
| 11 | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
| 12 | Elective Practical Respective Practical of the Elective Chosen | Paper 1 | 3 | 3 | (a) Endocrinology or (b)Biochemistry | 25 | 75 | 100 |
| | | | 30 | 30 | | 200 | 600 | 800 |
| SEMESTER III | | | | | | | | |
| 13 | MAIN | Paper-7 | 5 | 4 | Animal Physiology | 25 | 75 | 100 |
| 14 | MAIN | Paper-8 | 5 | 4 | Developmental Biology | 25 | 75 | 100 |
| 15 | MAIN | Paper-9 | 5 | 4 | Immunology | 25 | 75 | 100 |
| 16 | MAIN PRACTICAL | Paper-3 | 12 | - | Animal Physiology Developmental Biology and Immunology | - | - | |
| 17 | ELECTIVE (a)Disciplinary or | Paper-3 | 3 | 3 | (A) Fisheries Science (or) (B) Biophysics | 25 | 75 | 100 |
| | Elective(b)inter Disciplinary | | | | | | | |
| | | | 30 | 15 | | 100 | 300 | 400 |
| SEMESTER IV | | | | | | | | |
| 19 | MAIN | Paper-10 | 5 | 5 | Research Methodology | 25 | 75 | 100 |
| 20 | MAIN | PROJECT (OR) | 5 | 4 | Project / Dissertation with Viva Voce | 25 | 75 | 100 |
| | | Paper-11 | 5 | 4 | Evolution | 25 | 75 | 100 |
| 21 | MAIN | Paper-12 | 5 | 5 | Entomology | 25 | 75 | 100 |

| | | | | | | | | |
|----|--|-------------|-----------|-----------|---|------------|-----|------------|
| 22 | MAIN | Practical 3 | - | 5 | Animal Physiology Developmental Biology and Immunology | 25 | 75 | 100 |
| 23 | MAIN | Practical 4 | 9 | 5 | Research Methodology Evolution and Entomology | 25 | 75 | 100 |
| 24 | Elective (a) Disciplinary or Elective(b) inter Disciplinary | Paper 4 | 3 | 3 | (A) Sericulture (or) (B) Microbiology | 25 | 75 | 100 |
| 25 | Elective Practical (Respective Practical of the Elective Chosen) | Paper-2 | 3 | 3 | (a) Sericulture (or) (b)Microbiology | 25 | 75 | 100 |
| | | | 30 | 30 | | 200 | 600 | 800 |

*** For those not choosing Project / Dissertation with *viva voce*,
Main Paper 11 Evolution is compulsory**

| Subject | Papers | Credit | Total Credits | Marks | Total marks |
|-----------------------|-----------|--------|------------------|-------|-------------|
| MAIN | 12 | 4-5 | 50 | 100 | 1200 |
| MAIN PRACTICAL | 4 | 5-6 | 20 | 400 | 400 |
| ELECTIVE | 4 | 3 | 12 | 100 | 400 |
| ELECTIVE PRACTICAL | 2 | 3 | 6 | 100 | 200 |
| COMPULSORY PAPER | 1 | 2 | 2 | 100 | 100 |
| Total | 23 | - | 90 | - | 2300 |

THIRUVALLUVAR UNIVERSITY

M.Sc. ZOOLOGY

SYLLABUS

UNDER CBCS

(with effect from 2017-2018)

SEMESTER I

PAPER-1

LIFE AND DIVERSITY OF INVERTEBRATES

OBJECTIVES

To comprehend the systematic position, biodiversity, functional morphology, mode of life, affinities and phylogeny of invertebrates.

UNIT-I

Broad classification of the Animal Kingdom – Concepts of species, hierarchical taxonomy.

Protozoa

Feeding, Reproduction and Parasitic adaptations with suitable examples.

Economic importance of Protozoa.

Theories on Origin and evolution of Metazoa.

Porifera

Functional morphology of Freshwater sponges with suitable examples.

Marine sponges.

Reproduction in sponges.

Systematic position and Affinities.

UNIT-II

Coelenterata

Origin and evolution, Polymorphism and Reproduction.

Corals and Coral reefs.

Helminthes

Functional morphology and adaptations for parasitic mode of life. Helminthes in human diseases.

UNIT-III

Annelida

Archiannelida. Interrelationship between different classes of Annelida. Origin and evolution of coelom. Adaptive radiation in Annelida.

Arthropoda

Xiphosura-structure and affinities. Larval forms in crustaceans. Economic importance of Crustaceans. Phylogeny of Arthropoda.

UNIT-IV

Mollusca

Torsion in Gastropoda - Adaptive radiation in Mollusca. Phylogeny of Mollusca.

Echinodermata

Origin and evolutionary significance of Echinoderm larvae.

UNIT-V

Minor Phyla

Structural peculiarities and affinities of Nemertinea, Rotifera, Pogonophora and Phoronida

Invertebrate fossils: Trilobites, Brachiopoda, Cephalopoda and Echinodermata.

REFERENCE BOOKS

1. Barnes. R.D. 1974 Invertebrate Zoology. W.B. Saunders Co., Philadelphia.
2. Hyman L.H. 1951 The Invertebrata, Vol I to VI. Mc Graw – Hill Book Co., New York.
3. Carter, G.S.A. 1969. General Zoology of Invertebrates. Sidewick and Jackson Ltd., London.
4. Borradile, L.A. Eastham, L.E.S. and J.T. Saunders. 1977 The Invertebrate Cambridge University Press.
5. Barrington, E.J. W. 1969. Invertebrate Structure and Functions. English Language Book Society.
6. Moore, R.C. Lalicker, C.G. and Fisher, A.G. 1952 Invertebrate Fossils. Mc Graw Hill Book Co., New York
7. Gardinar, M.S. 1972 Biology of the Invertebrates, McGraw - Hill Book Co., New York.

PAPER-2

LIFE AND DIVERSITY OF CHORDATES

OBJECTIVES

To comprehend the systematic position, biodiversity, functional morphology, mode of life, affinities and phylogeny of chordates.

UNIT-I: TAXONOMY

Principles of taxonomy

Nomenclature- Binomial, Trinomial nomenclature.

Suffix as for super family name-(oidea), familyname (idea), use of suffixes 'i', 'orum', 'ae', 'arum', 'ensis' and 'iensis'.

Tautonyms synonyms and Homonyms.

New trends in taxonomy: Ecological approach, Ethological approach, Cytological approach, Biochemical approach and Numerical taxonomy.

Taxonomic key: Indented, Simple non-Bracket Grouped type, combination

Pictorial: Branching type, Circular and Box-type.

UNIT-II

Prochordata: Systematic position and phylogeny of prochordates.

Ostracoderms: Silurian and Devonian Ostracoderms. Evolutionary position of the Ostracoderms.

Placoderms: Origin of Jaws - Structural peculiarities of Cyclostomata.

UNIT-III

Chondrichthyes: Fossil history of chondrichthyes, tendencies in Elasmobranch evolution.

Actinopterygii: Origin and evolution, Adaptive radiation of bony fishes.

Amphibia: Origin and evolution of Amphibia.

UNIT-IV

Reptilia: Evolution of Reptilia. Saurischian and Ornithischian Dinosaurs - Rhyncocephalia - Adaptive radiation of Reptiles.

Aves: Birds as glorified reptiles. Fossil history of birds. Palate in Birds. . Adaptive radiation in birds.

Mammal: Evolution of Mammals, Structural peculiarities of Prototheria, Metatheria and Eutheria.

UNIT-V

Comparative anatomy: Origin and evolution of the vertebrate integumentary system. Paired fins and limbs, heart and aortic arches and brain of vertebrates.

REFERENCE BOOKS

1. Waterman. A.J. 1971. Chordate Structure and Function. McMillan Co. London.
2. Jolie, M. 1968. Chordate Morphology. East West Press. Pvt, Ltd,
3. Romer, A.S. and Parson, T.S. 1978 Vertebrate Body. W.B. Saunders Co., Philaelpia.
4. Young, J.2.1969. Life of Vertebrates. Clarendon Press, Oxford.
5. Colbert, E.H. 1969. Evolution of Vertebrates. John Wiley and Sons Inc, New York.
6. Holstead. 1969 The Pattern of Vertebrate Evolution. Freeman and Co. San Francisco. U.S.A.
7. Hobart M. Smith, 1960 Evolution of Chordate Structure, Holt, Rinehart and Winston. Inc. New York.
8. Kapoor, V.C. 1998 Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt, Ltd. New Delhi.
9. Hyman, L.H. 1966. Comparative Vertebrate Anatomy. The University of Chicago Press, Chicago.

PAPER-3

CELL AND MOLECULAR BIOLOGY

OBJECTIVES

To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

UNIT-I: STRUCTURE AND FUNCTIONS OF CELL ORGANELLES

Plasma membrane: Structure, Membrane receptors, Membrane transport - Membrane Potentials - cell adhesion, intercellular recognition - Intercellular junctions.

Endoplasmic reticulum - intracellular transport.

Mitochondria - Energetics - cellular respiration - mitochondrial replication.

UNIT-II: NUCLEUS

Cytoplasmic interactions, Nuclear receptors - Cell fusion: homokaryons, heterokaryons.

Structure and function of Chromatin - Euchromatin and heterochromatin - Polytene and lambrush Chromosomes

UNIT-III: CELL CYCLES AND CANCER CELL

Cell cycles - its components G_0 - G_1 transition - Spindle organization - Chromosome movements - Regulation and synchronization of cell division.

Cancer cell: Differences between normal and cancer cell- structural and functional characteristics -Tumour Viruses-Oncogenes - Environmental factors inducing cancer. Hormones in relation to cancer-Theories of carcinogenesis.

UNIT-IV: CHEMISTRY OF NUCLEIC ACIDS

Chemistry of DNA - Polymorphism of DNA - Mechanism and enzymology of DNA replication - DNA repair.

Chemistry of RNA - Different types of RNA and their functions.

UNIT-V: INFORMATION TRANSFER

Information transfer in Prokaryotes and Eukaryotes. Transcription - Promoters - Initiators and terminators – Post translational modifications – post transcriptional modifications. Trimming of introns and splicing of exons. RNA processing

REFERENCE BOOKS

1. De Robertis. E.D.F. and De Robertis. E.M.F. 2001. Cells and Molecular Biology, B.I Publications Pvt Ltd, India.
2. Lewin, B. 2000 Genes VII. Oxford University Press, New York.
3. Howland J.L. 1973. Cell Physiology, McMillan Publishing Co., New York.
4. De Witt, 1977. Biology of the cell. An evolutionary approach. Saunders Company.
5. Karp, G. 1979. Cell Biology. McGraw Hill Ltd., Japan.
6. Avers. C.J., 1976. Cell Biology. Van Nostrand Company, New York.
7. Korenberg. A. 1974. DNA Replication. Dorothy- W.H. Freeman and Company, San Francisco.
8. Hawkins, J.D. 1996. Gene Structure and Expression, Cambridge University Press, London.
9. Shanmugam, G., 1988. A laboratory manipulation in fish. Madurai Kamaraj University.
10. Albert, B and Watson. J.D. 1990. Molecular Biology of the cell. Garland Publishing, London.
11. Malacinski, G.M. 2005. Essentials of molecular biology. Narosa Publish House, Chennai.
12. Lodish, H., Berk A., Matsudaira, P., Kaiser, C.A., Krieger, M., Scott, M.P., Zipursky, S.L. and Darnell, J. 2004. Molecular Cell Biology. W.H. Freeman & Co., New York.

ELECTIVE

PAPER-1

(to choose either A or B)

A. AQUACULTURE AND FARM MANAGEMENT

Objectives

To understand the culture practices of both fin fish and shell fishes. This paper is planned to teach in the lines of knowing the candidate species of important fin and shell fishes. To Gain knowledge in the food and feeding habits, of fishes. To understand the scope of employment opportunities in aquaculture.

UNIT-I: Introduction to Aquaculture

Importance of aquaculture, Global scenario, Present status in India - Prospects and scope.

Aquaculture Farms

Site selection, topography, water availability and supply, soil conditions and quality. Design and layout, structure and construction.

UNIT II: Biology of important cultivable species and their economics

Standard guidance for choosing cultivable species - Seaweeds, Crustaceans (Prawns & Lobsters), Molluses (Clams, Cockles, Mussels and Oysters) and fishes - biological criteria - Environmental adaptability and compatibility - Economic importance - economics, market values, by-products and availability in adjacent region.

UNIT-III: Survey of seed Resources and Seed & Feed Production

Distribution and abundance of natural seed resources, collection methods and segregation.

Artificial seed production - breeding under controlled condition, induced breeding technique, larval rearing, packing and transportation.

Live feed - Microalgae, Rotifer and Artemia - their culture. Feed formulation - Conventional and non-conventional ingredients, feed additives, feed attractants and feed formulations.

UNIT-IV: Culture systems

Traditional, Extensive, Semi-intensive and intensive systems, composite fish culture, paddy-cum-fish culture, integrated fish culture, sewage water fish culture, raceway culture, cage, pen and rack culture. Culture system management - pond preparation, production and economics – employment opportunities in aquaculture.

UNIT-V: Farm Management

Water quality management - temperature, salinity, pH, O₂, CO₂ levels, nutrients and trace elements.

Control of parasites, predators, weeds and diseases in culture ponds.

Disease diagnosis - ELISA, Western blotting - DNA based diagnosis of diseases and fish vaccines.

REFERENCE BOOKS

1. Balugut, E.A. 1989. Aquaculture system and practices. A selected review publishing House, New Delhi.
2. Dash, M.C. and Patnik, P.N. 1994. Brackish water culture. Palani Paramount publications, Palani.
3. Michael, B.N. and Singholka, B. 1985. Freshwater Prawn Farming. A manual of culture of *Macrobrachium rosenbergii*. Daya Publishing House, New Delhi.

4. Paul Raj, S. 1995. Shrimp Farming techniques, Problems and solutions. Palani Paramount Publications, Palani.
5. Paul Raj, S. 1996. Aquaculture for 2000 A.D. Palani Paramount Publications, Palani.
6. Pillay, T.V.R. 1990 Aquaculture Principles and Practices. Blackwell Scientific Publications Ltd.
7. Ponnuchammy, R.1997. Practical Guide to shrimp farming. Palani Paramount Publications,palani.
8. Post, G.M. 1983. Text Book of Fish Health. TFH Publication.
9. Sinha, V.R.P. and Srinivastava, H.C. 1991. Aquaculture Productivity. Oxford and IBH Publications Co., Ltd., New Delhi.

PAPER-1

B. BIOSTATISTICS AND BIOINFORMATICS

OBJECTIVES

To understand the basic concepts of biostatistics and bioinformatics.
To solve biological problems through computational management.

UNIT-I: INFERTIAL STATISTICS

Introduction: Definition of statistical population and sample in biological studies. Variables: qualitative and quantitative, Discrete and continuous.

Probability; Basic principles - apriori and aposteriori probabilities - addition and multiplication rules of probability. Conditional probability. Theoretical distribution, normal binomial and Poisson - application (computation required).

UNIT-II

Hypothesis testing - Null hypothesis - levels of significance - degrees of freedom - type I and type II errors.

Test of significance: Chi-square test for goodness of fit, homogeneity and association between attributes (Problem relating to Genetics, patterns of distribution etc. to be worked out).

Test of significance for large and small samples - comparison of sample mean with population mean comparison of two - sample (computation required)

UNIT-III: CORRELATION AND REGRESSION

Correlation: definition and types - simple, multiple -partial, linear, nonlinear, mutual, cause and effect etc.

Uses of scatter diagram and correlation graph in the study of correlation between two variables. Computation of Karl Pearson's co-efficient of correlation - testing its significance, Interpretation.

Regression analysis, derivation of regression equation between two variable regression coefficient - construction of regression lines - properties - application. ANOVA

Population Statistics -Vital statistics - natality and morality rates. Population estimation - population growth.

UNIT-IV: BASIC BIOINFORMATICS

Bioinformatics - Biological /Specialized Database - Servers for Bioinformatics (NCBI, EBI, Genoment) Virtual Library - Data mining - Data Warehousing - Searching techniques - Genomics - Proteomics.

UNIT-V: ALGORITHM IN BIOINFORMATICS

Algorithm and tools sequence analysis - Similarity Search - Genetic algorithm - Gene finding - Protein prediction - Biomolecular visualization - Phylogenetic analysis - Drug designing.

REFERENCE BOOKS

1. Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-Hill Inc, New York.
2. Scheffler, W.C. 1963 Statistics for biological sciences. Addition - Wesley Publication Co., London.
3. Snedecor, G. Wand Cochran, W. G. 1967 Statistical Methods. Oxford Publication Co., New Delhi.
4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series McGraw -Hill International Book Co., Singapore.
5. Pillai, R.S.N. and Bagawathi, V.2005 Statistics. S. Chand & Co.Ltd, New Delhi.
6. Stansfield,W.O. 1984 Theory and Problems of genetics(including 600 problem) Schaum's outline series.McGraw - Hill Book, Co., New York.

7. Sokal, R.R. and Rohlf, F. J. 1969 Biometry. The Principles and Practice of Statistics in Biological Research. W.H. Freeman and Co., San Francisco.
8. Mahajan, B.K. 1984. Methods in Biostatistics for Medical students and research Workers. Smt. Indu Mahajan, New Delhi.
9. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.
10. Westhead, D.R., Parish, J.H. and Tugman, R.M. 2003 Bioinformatics. Viva Books Pvt. Ltd., New Delhi
11. Arthur, M.L. 2003. Introduction to Bioinformatics Oxford University Press, New Delhi.
12. Higgins D. and Taylor, W. 2000 Bioinformatics: Sequence, Structure and Databases. Oxford University Press, New Delhi.
13. Durbin, R., Eddy, S.R., Krogh, A. and Mitchison, G. 1998. Biological sequence Analysis. Cambridge University Press, Cambridge, U.K.
14. Baxevanis, A. and Ouellette, B.F. 1998. Bioinformatics: A practical guide to the analysis of genes and proteins. Wiley Interscience, Hoboken, New Jersey, USA.
15. Arthur M. Lesk. 2006. Introduction to Protein structure. Oxford University Press, New Delhi.

SEMESTER II

PAPER-4

GENETICS

OBJECTIVES

To understand the fine structure of genetic materials and regulation of their action. To know the chromosomal basis of genetic disorders, development and differentiation. Also, to acquire the knowledge of the importance of population genetics and nuances of genetic engineering and applied genetics.

UNIT-I: MOLECULAR STRUCTURE OF GENETIC MATERIAL

Molecular structure of DNA and RNA – Replication of DNA and RNA - theories, Gene concept - One gene one polypeptide concept.

Identification of DNA and RNA as the genetic material.

Microbial Genetics - Conjugation, transformation and transduction and Sexduction.

Chromosome mapping in prokaryotes (Virus, Bacteria) and eukaryotes (Neurospora and Man)

UNIT-II: REGULATION OF GENE ACTION

Enzyme regulation of gene action. Gene regulation of gene action - Operon concept - GAL and LAC Operon system. Evidence of regulation of gene action.

Genes and metabolism. Inborn errors of metabolism in Man (With reference to protein, carbohydrates, Lipid and nucleic acid).

UNIT-III: CHROMOSOME AND GENETICS DISORDERS

Sex chromosomes. Dosage compensation - X inactivation. Geneomic imprinting.

Human Genetics: Variations in karyotypes (autosomal and sex chromosomal) with special reference to Klinefelters, Turners and Down's syndromes in man. Genetic counselling - Objectives, ethics and principles.

UNIT-IV: GENES IN DEVELOPMENT, RADIATION GENETICS AND POPULATION GENETICS

Genes in development and differentiation Mechanism of chromosomal breakage - physical chemical and biological factors or agents. Mutagens and mutagenesis and carcinogenesis - genetic changes in Neoplasia in man

Population genetics:

Population and gene pool. Hardy Weinberg Law-Genetic equilibrium.

Calculation of gene frequencies for Autosomal (Complete dominance, codominance and multiple alleles) and sex linked genes. Factors affecting Hardy Weinberg equilibrium.

UNIT-V: GENETIC ENGINEERING AND APPLIED GENETICS

Genetic Engineering - Restrictive enzymes - Recombinant DNA techniques. Applications of Recombinant DNA technology.

Applied Genetics - Application of genetics in animal breeding. Application of genetics in Crime and Law - DNA fingerprinting, Genetic basis of intelligence. Studies on Twins.

REFERENCE BOOKS

1. Watson. J.D. Hopkins, N.H., Roberts, J.W., Steitz, J.A. and Weiner, A.M. 1987 Molecular Biology of the Gene. W.A. Benjamin/Cummings Co., New York.
2. Sinnot. E.W., Dunn. L.C., Dobzhansky, T.H. 1973. Principles of Genetics. McGraw Hill Co., New Delhi.
3. Daniel L. Hartl. 1994. Genetics. Jones and Barflaff Publishing, Boston.
4. Lewin, B. 2000. Genes VII. Oxford University Press, New York.

5. Ayala, F. I. and Kieger, J.A. Jr., 1980, Modern Genetics. The Benjamin Publishing Co. London,
6. Goodenough, U. 1984. Genetics. Saundes College Publishing Co., London.
7. Curs Sten 1973 Principles of Human Genetics. W.H. Freeman and Co., New York.
8. Jenking, J.B. 1983. Human Geneties. The Benjamin Cummings Publishing& Co., Londen.
9. Market, C.L. & Ursprung, 1973. Development Genetics, Prentice Hall.
10. Gardner E.J. Simmons, M.J. and Snustad, D.P.1991 John Wiley & Sons, New York.
11. Tamarin, R.H. 1996. Principles of Geneties, WCB Publishers Munro.
12. Stickberger, M.W. 1985. Genetics. Printice - Hall of India, Pvt. Ltd., New Delhi.
13. Pandian, T.J. and Muthukrishnan, J. 1988. Workshop on Research Methods for Chormosomal Manipulation in Fish. Department of Biotechnology Govt. of India, New Delhi.
14. Pandian, T.J. and Muthukrishnan, J. 1990. Research Methods for Gene and Chorosome Manipalation in Fish. Department of Biotechnology, Govt. of India, New Delhi.

PAPER-5

ENVIRONMENTAL BIOLOGY

OBJECTIVES

To generate up-to-date knowledge on environmental conservation and management. To understand the components of ecosystem, habitat ecology and resource ecology, biogeochemical cycles. To create awareness on pollution and its management.

UNIT-I: ECOSYSTEM AND COMMUNITY

Review of concept of ecosystem - Natural and Man-made ecosystem, with examples. Biomass - Energyflow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement.

Definition, nature and flux of energy through communities. Influence of competition and predation - Community succession - homeostasis.

UNIT-II: HABITAT AND POPULATION

Habitat – Definition – physic-chemical features of Terrestrial and aquatic habitats.

Population - Structure and distribution - Growth curves - Groups, natality, Mortality - Density indices, Life study tables - factors affecting population growth - Carrying capacity. Population regulation and human population control.

UNIT-III: BIOGEOCHEMICAL CYCLES AND RESOURCES ECOLOGY

Complete and incomplete biogeochemical cycles - Sedimentary cycle - Recycle pathway of elements - Cycling of non - essential and organic nutrients.

Biomass, Adaptations with reference to physico - chemical features of environment of coastal ecosystems.

Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

UNIT-IV: ENVIRONMENTAL CONSERVATION AND MANAGEMENT

Principles of conservation - Rain water harvesting - Soil health and fauna inputs in agriculture Biosphere reserves - wildlife conservation and management. Biodiversity - Germplasm conservation and cryopreservation. Social forestry and tribal welfare.

UNIT-V: POLLUTION AND MANAGEMENT

Environmental pollution and its biological effects. Air, water, soil and noise pollution. Biological indicators and their role in environmental monitoring.

REFERENCE BOOKS

1. Odum. E.P. 1996 Fundamentals of Ecology. Nataraj Publishers, Dehra Dun.
2. Trivedi, P.R.and Gurdeepraj, K. 1992. Environmental Biology. Akashdeep Publishing House New Delhi
3. Berwer. A.1988 .The Science of ecology. Saunder's college publishing.
4. Bandopadhyay, J.1985. India's Environment Crisis and response. Nataraj Publishers,Dehra Dun.
5. Smith, R.L.1986. Elements of Ecology. Harpet and Row Publishers, New York.
6. Ismail, S.A.1997. Vermicology, Biology of Earthworms. Orient Longman, Chennai.
7. Alpha Soli, I. Arceivala.1998. Wastewater treatment for pollution control - Second Ed. Tata McGraw Hill Publication Company Ltd., New Delhi.
8. Asthana, D.K. and Asthana, M.2001. Environmental Problems and Solutions. S. Chand and Co., New Delhi.

PAPER-6

BIOTECHNOLOGY

OBJECTIVES

To familiarize the use of the data and techniques in Biotechnology in living organisms. To find solution of problems concerning human activities including agriculture, medical treatment, industry and environment.

UNIT-I: GENETIC ENGINEERING AND RECOMBINANT DNA TECHNOLOGY

Gene cloning - the basic steps - various types of restriction enzymes - ligase linkers and adaptors - c DNA - transformation - Selection of recombinants. Hybridization techniques chemical synthesis of oligonucleotides.

Gene probe - Molecular finger printing (DNA finger printing) - RFLP - the PCR techniques - Genomic library - Blotting techniques - Southern blotting - Northern blotting - Western blotting

UNIT-II: CLONING VECTORS

Plasmid biology - cloning vector based on E. coli PBR 322 and bacteriophage. Cloning vector for yeast. Cloning vector for Agro bacterium tumefaciens. Cloning vector for mammalian cells - Simian virus 40 - Gene transfer technologies. Human welfare – Genes for vaccines – monoclonal antibodies.

UNIT-III: ANIMAL BIOTECHNOLOGY

Cell culture - Organ culture - whole embryo culture - Embryo transfer - In vitro fertilization (IVF) technology - Dolly - embryo transfer in human. Transgenic animal. Human gene therapy. Cryobiology. Bioethics in animal genetic engineering.

UNIT-IV: MICROBIAL BIOTECHNOLOGY

Fermentation - bioreactor - Microbial products - Primary & Secondary Metabolites - enzymes technology - single cell protein (SCP). Biopolymers, Biopesticides and Biofertilizers. Biological control – microbial inoculants.

UNIT-V: ENVIRONMENTAL BIOTECHNOLOGY AND APPLICATIONS OF BIOTECHNOLOGY

Bioremediation - bioremediation of hydrocarbons - Industrial wastes - Heavy metals - Xenobiotics - bioleaching - biomining - biofuels. Applications of biotechnology in agriculture, medicine and food science. Genetically modified organism (GMO'S) - GM foods. Biotechnology & biosafety – IPR – Patent – patenting of biological materials – product patents.

REFERENCE BOOKS

1. Purohit, S.S. and S.K.Mathur. 1999. Biotechnology Fundamentals and Application. Agro Botanica, New Delhi.
2. Alan Scragg. 1999. Environmental Biotechnoogy, Longman Publication.
3. R.C.Dubey 2001 A text book of biotechnology. Rajendra Ravindra Printer. New Delhi.
4. T.A. Brown 2004 Gene cloning and DNA analysis. Blackwell Science, Osney Mead, Oxford.
5. Dawson, M.T., Powell .R, and Gannon, F. 1996. Gene Technology. Bios Scientific Publishers.
6. Chopra, V.L. and Nanin, A.1992. Genetic Engineering and Biotechnology. Oxford and I BH Publishing Co., New Delhi.
7. Marx, J.L.1989 A Revolution in Biotechnology. Cambridge University, Press, Oxford.
8. Old, R.W.and Primrose, S.B.1985 Principlesof Gene Manipulations. An introduction to Genetic Engineering. Oxford Blackwell Publishers, London.
9. Winnacker, E.L. 2003. From Genes to Clones. Panima Publishing Corporation, New Delhi.
10. Gupta, P.K. 2004. Biotechnology and Genomics. Rastogi Publications, Meerut.
11. Das, H.K. 2004. Text Book of Biotechnology. Wiley Dreamtech India Pvt. Ltd., New Delhi.

ELECTIVE

PAPER-2

(to choose either A or B)

A. ENDOCRINOLOGY

OBJECTIVES

To learn the objectives of endocrinology. To study the comparative account and functions of endocrine glands of vertebrates, crustacean and insect with their functions.

UNIT-I: GENERAL ENDOCRINOLOGY

Endocrine glands and its hormones – classification – features. Endocrine glands in crustaceans, insects and vertebrates. Hormonal effects and regulation - Experimental methods of hormone research - general classes of chemical messengers – General classes of hormones.

UNIT-II: PHYLOGENY AND ONTEGENY OF ENDOCRINE GLANDS

Pituitary, Pancreas, Thyroid, Parathyroid, Adrenal, Thymus, Testis and Ovary in the following classes Pisces, Amphibians, Reptiles and Mammals.

UNIT-III: INSECTS AND CRUSTACEAN ENDOCRINOLOGY

Concepts of neurosecretions - endocrine systems in crustaceans - endocrine control of moulting and metamorphosis - neuroendocrine system in insects - endocrine control of moulting - metamorphosis and reproduction.

UNIT-IV: VERATEBRATE REPRODUCTIVE ENDOCRINOLOGY

Structure of mammalian testis and ovary - male and female sex accessory organs - hormones of testis and ovary - estrous and menstrual cycle - hormones of pregnancy - parturition - hormonal control of lactation.

UNIT-V: HORMONES AND HEALTH

Hormonal control of metamorphosis in an anuran amphibian. Hormones and health – production of hormones as pharmaceuticals.

REFERENCE BOOKS

1. Haris, G.W. and B.T. Donovan. 1968. The Pituitary Gland. S. Chand and Co.,
2. Bentley, P.J. 1985. Comparative vertebrate endocrinology, Second Edition, Cambridge University Press. Cambridge.
3. Mac Hadley. 1992. Endocrinology, 3rd Edition. Prentice - Hall Inc. A Simon & Schuster Company, Englewood Cliffs, New Jersey. USA.
4. Ingleton, P.M. and J.T. Bangara. 1986. Fundamentals of comparative vertebrate endocrinology, Kluwer Academic Publishers.
5. Turner, C.D. and J.T. Bangara. 1986. General endocrinology. Saunders International Student edition. Toppan Company Limited. Tokyo.
6. Barrington, E.J.W. 1985. An introduction to general and comparative endocrinology. Claredon Press Oxford.

PAPER-2

B. BIOCHEMISTRY

OBJECTIVES

To study the chemical constituents of living matter, chemistry of food stuffs and its metabolism in animal systems. To know the bioenergetics and hormonal regulation.

UNIT-I: WATER

Water - Biological importance, pH and Acid - Base balance. Henderson Hasselbach equation. Buffers - Biological importance. Acidosis, Alkalosis. Electrolyte and water balance.

UNIT-II: BIOMOLECULES

Amino acids - structure, classification and function. Peptide bonds. Essential and non - essential amino acids, isoelectric point, switter ion. Protein - structure, classification, Properties of protein - Deamination, transamination, transmethylation.

Carbohydrate - structure, classification and biological significance.

Lipid - Structure classification and biological significance

UNIT-III: ENZYMES AND BIOENERGETICS

Enzymes - general properties, function, classification, nomenclature. Enzyme kinetics - Factors affecting enzyme action, Mechanism of enzyme action, Enzyme regulation.

1. Glycogenesis, 2. Glycogenolysis, 3. Glyconeogenesis, 4. Glycolysis, 5. Hexose mono phosphate shunt. Biosynthesis and Oxidation of Fatty Acids. Energetics.

UNIT-IV: HORMONES

General functions, Classification of Steroid and Protein Hormones.

Synthetic Hormones - Mechanism of Hormone action.

UNIT-V: VITAMINS

Water and Lipid soluble Vitamins - structure, classification, sources and deficiencies in man.

Reference Books

1. Murray, R. K, Granner, D.K. Maynes, P.A and Rodweli, V. W. 1998. Harper's Biochemistry. 25th Edition. McGraw Hill, New York.
2. Hames, B. D., Hoopa, N.M and Houghton, J.D. 1998. Instant notes in Biochemistry. Viva Books Pvt. Ltd. New Delhi.
3. Jain, J. L. Jain, S. and Jain N. 2005. Fundamental of Biochemistry, S. Chandra & Co. Ltd. New Delhi..
4. Vasudevan, D.M. and Sreekumar. S. 2000. Text of Biochemistry for Medical students. Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi.
5. Rama Rao, A.V.S.S. 1986. Text Book of Biochemistry. L.K. & S Publishers. A.P.
6. Ambika, S. 1990. Fundamentals of Biochemistry for Medical Students, Published by the author.
7. Lehninger, A.L. 2004. Principles of Biochemistry. CBS Publishers, New Delhi.
8. Zubay, G.1989. Biochemistry. McMillan Publishing Co., New York.
9. Voet, D and Voet, J.G. 2004. Biochemistry. John Wiley and Sons, Inc.

MAIN PRACTICAL

PAPER-1

**LIFE AND DIVERSITY OF INVERTEBRATES AND CHORDATES AND CELL
AND MOLECULAR BIOLOGY**

INVERTEBRATA (Slides / Specimens / Xerox)

1. Identification and study of selected Protozoans and Helminthes of medical importance. (Any Two)
2. Identification and study of sections of available animals from Cnidaria, Aschelminthes and Annelida to understand the evolution of /different types of coelom.
3. Identification and study of larval forms from all major phyla of Invertebrates.
4. Identification and study of types minor phyla.
5. Identification and study of Invertebrate fossils
6. Dissection of digestive system of any insect, pila, sepia / loligo
7. Dissection of nervous system of Prawn, any insect, Pila, and Sepia/Loligo.
8. Dissection of reproductive system of any insect.
9. Mounting of:
 - a. Appendages or Prawn
 - b. Gnathochilarium, Radula of Pila
 - c. Sting of Honeybee
 - d. Pedicellaria of Sea urchin - Demonstration
 - e. Aristotle's lantern of sea urchin - Demonstration
10. Study of prepared slides of mouth part of Honey bee, Housefly, Mosquito, Bed bug and Butterfly to relate structure and function.

CHORDATA (Slides / Specimens / Xerox)

1. Study of the following specimen to bring out their affinities:
 - a. Amphioxus
 - b. Balanoglossus
 - c. Ascidian
 - d. Peteromyzon
2. Study of the following specimens with reference to their adaptive features for their respective modes of life
 - a. Echinoids
 - b. Ichthyophis / Uraeotyphlus
 - c. Hyla
 - d. Draco
 - e. Pigeon
 - f. Bat
3. Study of the following skull types with reference to jaw suspensions
 - a. Fish
 - b. Frog
 - c. Calotes
 - d. Snake
 - e. Rat/Rabbit
4. Dissection and mounting of Weberian ossicles in Cat fish.
5. Dissection of aortic arches in Teleost
6. Dissection and display of IXth and Xth Cranial nerves of cat fish
7. Demonstration of portal system of Rat
8. Demonstration of urinogenital system of Rat.

CELL AND MOLECULAR BIOLOGY

CYTOLOGICAL TECHNIQUES

Micrometry – measurements using ocular and stage micrometers – measurements of cell from any prepared slide.

Vital staining – Buccal smear stained with Methylene blue.

CHROMOSOME

Chromosome preparation – procedure. Preparation of meiotic chromosomes from any fish – (demonstration)

MOLECULAR BIOLOGY TECHNIQUES (Demonstration only)

Centrifuge, Isolation of DNA from Liver – Isolation of RNA – Denaturation of DNA – measurement of spectrophotometry – Isolation and analysis of proteins – electrophoresis.

MAIN PRACTICAL

PAPER-2

GENETICS, ENVIRONMENTAL BIOLOGY AND BIOTECHNOLOGY

GENETICS

1. Preparation of culture medium Culture of *Drosophila*. Methods of maintenance. Sex identification. Identification of four mutants.
2. Identification of blood groups A,B, ABO and Rh,
3. Mounting of salivary glands of *Drosophila* larva or *Chironomus* larva. Analysis of banding pattern
4. Preparation of Buccal smear to show squamous epithelial cells.
5. Karyotyping using human metaphase chromosome plates (Giemsa stained). Identification of syndromes (Down, Klinefelter and Turner) from Karyotype Photographs showing clinical features of each syndrome case.
6. Problems relating to the application of binominal theorem in population genetics with reference to P.T.C. and Earlobe attachment.

ENVIRONMENTAL BIOLOGY

1. Estimation of Aquatic - Primary productivity - Dark and Light bottle.
2. Estimation of Dissolved oxygen, Salinity, Nitrites, Phosphates, Calcium, Silicates and Alkalinity in water samples.
3. Analysis of Industrial effluent - TDS, TSS, BOD, (COD - Demonstration).
4. Collection, isolation and identification of Plankton.
5. Study of sandy, muddy and rocky shore fauna with special reference to the adaptation to the environment.
6. Animal Association - parasitism, mutualism and commensalisms.

8. An educational tour to:-

- a). Drinking water treatment plant.
- b). Effluent treatment plant
- c). Sewage treatment plant.
- d). Sandy, Muddy and Rocky Shores.

BIOTECHNOLOGY

Visit to Biotechnology Laboratory to observe the demonstration of,

- 1. Tissue culture.
- 2. Titration and preparation of virulent phage.
- 3. Isolation of DNA from the plasmids.
- 4. Restriction enzymes digestion of DNA.
- 5. DNA electrophoresis in Agarose gel.

Necessary books may be referred to learn the techniques and to be recorded in the record Note books. Observation of photographs of different instruments used in Biotechnology, their principles and applications.

ELECTIVE

PRACTICAL

PAPER-1

(to choose either A or B)

A.ENDOCRINOLOGY

Dissections and localization of endocrine glands in any one suitable Vertebrate.

Dissection of neuroendocrine complex in insects.

Parabiosis in insect - cockroach.

Ovariectomy in cockroach.

Histology of pituitary, thyroid, adrenal, pancreas, testis and ovary.

Permanent slide preparation of any one endocrine gland.

ELECTIVE
PRACTICAL
PAPER-1
B.BIOCHEMISTRY

1. Buffer preparation and determination of P^H - Demonstration,
2. Enzyme kinetics - any one enzyme (Salivary amylase) Maltose standards, influence of enzyme concentration, time course, pH, Temperature, Substrate concentration (Lineweaver Burk Plot) on enzyme activity.
3. Qualitative analysis of urine - protein, glucose, Ketone and acetone bodies.
4. Chromatography: Determination of amino acids in body fluids and tissues of goat.
5. Quantitative estimation of glucose, protein, cholesterol, urea and creatinine in the serum of goat.

Principles and application of spectrophotometry or colorimetry, electrophoresis, centrifuge, Chromatography.

SEMESTER III

PAPER-7

ANIMAL PHYSIOLOGY

OBJECTIVES

To gain knowledge on organ system and functions. The physico-chemical coordination of the animals.

UNIT-I: NUTRITION

Nutrition - nutrients - digestion and absorption of proteins, carbohydrates and lipids. Role of gastrointestinal hormones in digestion.

UNIT-II: RESPIRATION AND CIRCULATION

Physiology of respiration in Man. Respiratory Pigments, nervous and chemical control of respiration, BMR.

Circulation - types of hearts - physiology of cardiac muscle - heart beat and its regulation - blood coagulation and theories.

UNIT-III: EXCRETION AND OSMOREGULATION

Excretion - excretion of metabolic waste products in relation to the environment - physiology of excretion in Man

Osmoregulation - osmoregulation in Invertebrates (crustaceans), fishes, birds and mammals -hormonal control.

UNIT-IV: ANIMAL AND REPRODUCTION

Neuro muscular co-ordination - types of neurons, transmissions of nerve impulse and reflex action. Chemical composition of muscle fiber and physiology of muscle contraction. Myoneural Junction. Endocrine glands in mammals. Physiology of mammalian reproduction - reproductive cycle - hormonal control of reproduction.

UNIT-V: BEHAVIOURAL PHYSIOLOGY

Bioluminescence - chemistry and functional significance. Behaviour (types - trophism, taxis, kinesis, reflex, learning). Temperature regulation: Poikilotherms, homeotherms and heterotherms - hibernation, aestivation - diapause.

REFERENCE BOOKS

1. Hoar, W.S.1991. General and Comparative Physiology. Prentice Hall of India, New Delhi.
2. Prosser, C.L. 1973. Comparative Animal Physiology, 3rd edn. W.B. Saunders & Co., Philadelphia.
3. Barrington, E.J.W.1975. An Introduction to General and Comparative Endocrinology. Clarendon Press, Oxford
4. Bentley, P.J.1971. Endocrine and osmoregulation, Springer Verlag, New York.
5. Palmen, J.D. Brown, I.R and Hastings, J.W.1970. Biological clocks, Academic Press, London.
6. Welson, A. 1979. Principles of Animal Physiology. McMillan Publishing Co. Inc. New York.
7. Schmidt Nilssen, K.1985. Animal Physiology. Adaptation and Environment Club, London.
8. Herkat, P.C. and Mathur, P.N.1976. Text Book of Animal Physiology. S.Chand Co. Pvt, Ltd., New Delhi.

PAPER-8

DEVELOPMENTAL BIOLOGY

OBJECTIVES

To gain knowledge on the experimental aspects of embryology. To study the modern tools in embryology.

UNIT-I: EARLY DEVELOPMENT

Gastrulation movements: role of egg cortex - cell surface in morphogenesis. Cell adhesion and cell communication. Chemotactic induced aggregation - aggregation in sponges. Experimental analyses in the early development of Echinoderms, Amphibians and birds.

UNIT-II: ORGANOGENESIS

Formation of organ rudiments, differentiation and development of heart and kidney in different mammals. Organiser , Inductive tissue interactions in developments.

UNIT-III: GENES AND DEVELOPMENT

Nuclear transplantation. Cellular differentiation and protein synthesis. Differential activation. Developmental genetic defects. Role of cell death in development.

UNIT-IV: REGULATION OF DEVELOPMENT

Metamorphosis - morphological and biochemical changes during amphibian metamorphosis. Hormonal control of metamorphosis in amphibians - Neuro endocrine control of insect metamorphosis - Biochemistry and mechanism of action of hormones during metamorphosis

UNIT-V: EMBRYONIC NUTRITION

Nutritional requirements of Embryo- modes of embryonic nutrition –Food reserve and embryonic nutrition- embryonic nutrition from mother –physiology of placenta

REFERENCE BOOKS

1. Balinsky, B.I.1981 An Introduction to Embryology. W.B Saunders Co., Philadelphia.
2. Karp,G. and Berrill,N.J.1981. Development. McGraw Hill, New York.
3. Saunders, J.W.1982. Developmental Biology. MacMillan Co., London.
4. Nagabhushanam,R. and Sarojini,R.2002 Invertebrate Embryology. Oxford and IBA Publishing Co.
5. Tyagi,Rajiv and Shukla,A.N.2002. Development of Fishes. Jaya Publishing House, New Delhi.
6. Browder, W.1984.Developmental Physiology. Saunders College Publishing, Rinchert and Winston.
7. Gilbert, S.F.2003.Developmental Biology. Sinamer Associates Inc. Saunderland, Massachusetts, U.S.A.
8. Oppenheimer, S.B.1980.Introduction to Embryonic Development. Allyn and Bacon,Inc. U.S.A.
9. Mitra, S.1994. Genetics, A Blueprint of Life. Tata McGraw - Hill Publishing Company Ltd., New Delhi.

PAPER-9

IMMUNOLOGY

To Understand the Structural and functional basis of immunology and immune system. To understand the mechanism of antigen-antibody reaction.

UNIT-I: IMMUNE BIOLOGY

The cellular constituents of the lympho reticular system-phagocytic cells-poly morpho nuclear neutophils, mono nuclear phagocytes eosinophils and lymphocytes

UNIT-II: IMMUNOGLOBULINS

Immunoglobulins-structure, isotypes and biological function. Antigenic determinant on immunoglobulin-isotype, allotype and idiotype. Immunoglobulin superfamily, monoclonal and polyconal antibodies. organization and expression of immunoglobulin genes. Synthesis of immunoglobulin and disorders of immunoglobulin synthesis.

UNIT-III: DETECTION AND APPLICATION OF ANITGEN ANTIBODY REACTION

Precipitation - agglutination - complement fixation - immunoassay using labelled reagents

UNIT-IV: MECHANISM OF IMMUNE SYSTEM

Antigen-antibody interaction. MHC- Restriction organization and inheritance of MHC, Antigen processing and presentation.

UNIT-V: TRANSPLANTATION IMMUNOLOGY

B-cell Receptors, T-cell receptors, cytokine, adhesion molecules, complements , hypersensitivity reaction , transplantation immunology .

REFERENCE BOOKS

1. Roitt,I.M.1994. Essential Immunology. Blackwell Scientific, Oxford.
2. Richard A.Goldsby, Thomas T.Kindt and Barbara A. Osborne. 2000. Kuby Immunology.Freeman and Co., New York.
3. Stites,D.P.,Terr,A.I. and Parsloio,T.G. 1997.Medical Immunology. Prentice Hall, New Jersey.
4. Janeway,C.A and Travers,P. 1997.Immunobiology.Current Biology Ltd., London.
5. Paul,W.E.M.1989. Fundamentals of Immunobiology. Raven Press, New York.
6. Srivastava,R.,Ram,B.P. and Tyle,P.1991. Molecular Mechanism of Immune Regulation. VCH Publishers, New York.
7. Champion,M.D. and Cooke,A.1987.Advanced Immunology. J.B.Lippincott Ltd., Philadelphia.
8. Kannan,I.2007. Immunology. MJP Publishers, Chennai.

ELECTIVE

PAPER-3

(to choose either A or B)

A. FISHERIES SCIENCE

OBJECTIVES

The aim of the paper is to understand the morphology, classification and identification of fishes and the fisheries and fishery resources of India. Moreover information about the biology of the fishes goes a long way in managing the fishery resources and their sustainable utilization. As fishes constitute perishable commodity, preservation and processing are also quite essential. To know the different methods of preservation and processing of fishes.

UNIT-I: BIOLOGY OF FISHES AND CLASSIFICATION

General morphology and outline classification of fishes - major groups of fishes and their characteristics - morphometric and meristic characters of elasmobranchs and teleost fishes.

Basic anatomy of fish - digestive, circulatory, respiratory, nervous and reproductive systems.

Food and feeding habits, maturity, fecundity, spawning and survival of Indian fishes.

UNIT-II: GROWTH AND POPULATION DYNAMICS

Length-weight relationship and factors influencing growth condition, age determination

Theory of fishing, unit stock, recruitment, growth, mortality, migration, fish tagging and marking.

UNIT-III: INLAND CAPTURE AND MARINE CAPTURE FISHERIES OF INDIA

Fishery zones and type of fisheries in India.

Riverine, Estuarine, Coldwater, Reservoir and Pond fisheries.

Present status and scope of inland capture fisheries - their fishery characteristics, distribution and importance.

Present status and scope of marine capture fisheries - crustaceans crabs), (prawn/shrimp, lobster and Molluscs(clam, cockle, mussel, oyster, their cephalopods) and fishes - fishery characteristics, distribution and importance.

UNIT-IV: FISHERY SURVEY METHODS

Methods of surveying the fishery resources - acoustic method, aerial method, survey of fish eggs and larvae, analyzing population features - growth mortality selection.

UNIT-V: CRAFTS AND GEARS

Principal methods of exploitation of fishes - indigenous and modern gears and crafts.

Principal methods of fish preservation and processing in India

Types of spoilage, causative factors - marketing and economics.

REFERENCE BOOKS

1. Day, F. 1981. Fishes of India, Vol.I and Vol. II. William Sawson & Sons Ltd., London.
2. Jhingran, C.G. 1981. Fish and Fisheries of India. Hindustan Publishing Co., India.
3. Maheswari, K. 1993. Common fish diseases and their control. Institute of Fisheries Education, Powakads, M.P.
4. Santhanam, R. 1980. Fisheries Science. Daya Publishing House, New Delhi.
5. Yadav, B.N. 1997. Fish and Fisheries. Daya Publishing House, New Delhi
6. FAO Volumes for fish identification.
7. Bal D.V. and Rao, K.V. 1990. Marine Fisheries of India. Tata McGraw Hill Publishing Co. Ltd., New York.
8. Biswas, K. P. 1996. A Text Book of Fish, Fisheries and Technology. Narendra Publishing House, Delhi.
9. Srivastava, C.B.L. 1999. Fish Biology. Narendra Publishing House, Delhi.

PAPER-3

B. BIOPHYSICS

OBJECTIVES

To gain knowledge on the principles and methods in conducting a basic research. To know the principle and applications of various research instruments.

UNIT-I: BIOMOLECULES AND BONDING

Electron configuration of an atom. Bonds - Covalent bond, Hydrogen bond, Disulphide bond, Peptide bonds. Forces between Molecules - Electrostatic force, Van der Waal's forces - hydrophobic and hydrophilic - biological importance.

UNIT-II: THERMODYNAMICS AND BIOLOGICAL OXIDATION

Laws of Thermodynamics - Concept of free energy and entropy - Exergonic and Endergonic reactions. Rate of reactions - Effect of sunlight and temperature on reactions. Energy of Activation - Arrhenius expression.

Diffusion - Fick's Laws, constant laws. Osmotic coefficient - Gibbs Donnan equilibrium.

Oxidation and reduction reactions - Redox potentials in biological system, High energy phosphate group. Bioluminescence.

UNIT-III: MICROSCOPY

Principle and biological application of Light microscope, Electron microscope, Polarising microscope, Fluorescent microscope, Phase contrast microscope, Dark field microscope, Interference microscope and X-ray microscope.

UNIT-IV: PHOTO BIOPHYSICS

Electromagnetic spectrum - visible and invisible region. Principles involved in Photoelectric colorimetry. Principle of Spectroscopy - UV & IR Spectroscopy in biological investigation. Effects of UV on biological systems.

Delayed effects of radiation - Ageing, reduction in life span, cancer.

Radioactive isotopes - measurements - GM tubes, Liquid Scintillation counters. Autoradiography. Effects of radiation.

UNIT-V: BIOPHYSICAL PRINCIPLES APPLIED TO PHYSIOLOGY

Biophysical aspects of vision, hearing, nerve conduction and muscle contraction.

REFERENCE BOOKS

1. Bose, S. 1982. Elementary Biophysics. Jyoth Books,
2. Burns, D.M. and MacDonald, S.G.G. 1979. Physics for Biology and Premedical students. ELBS and Addison - Wesley Publishers Ltd., London.
3. Casey, E.J. 1962. Biophysics concepts and Mechanism. Affiliated East-West Press Pvt. Ltd., New Delhi.
4. Das, D. 1982. Biophysics and Biophysical Chemistry. Academic Publishers. New Delhi.
5. Epstein, H.T. 1963. Elementary Biophysics, selected topics. Addison - Wesley Publishing Company Inc. London.
6. Palanichamy, S and Shanmugavelu, M. 1991. Principles of Biophysics. Palani Paramount, Publication; Tamil Nadu.
7. Roy, R.N. 1996. A Text Book of Biophysics, New Central Book Agency Ltd, Calcutta.

SEMESTER IV

PAPER-10

RESEARCH METHODOLOGY

OBJECTIVES

The main objectives of this paper are to expose students to state of the art instrumentation. To gain knowledge on the principles, methods and a various instruments used in biology and to prepare them to use these techniques in their own research. The course is a combination of lectures and demonstrations on basic principles and applications of the Spectrophotometers, Chromatographs and Electrophoresis system. With the aid of computer system and software, the students are also given hands on training in bioinformatics. Also, this paper is to acquire knowledge on the preparation of research manuscripts etc.

UNIT-I: BIOSTATISTICS & BIOINFORMATICS

Collection and analysis of biological data - mean, median, mode Standard deviation, Standard error, Coefficient of variation, Student 't' test, Skewness, Kurtosis, Chi - square, Correlation, Regression and ANOVA.

Internet - Worldwide Web - Search Engines - their functions. Boolean searching - file formats.

Biological data bases - sequence and structure - date retrieval - searching source data bases - sequence similarity searches - FASTA and BLAST, clustral and phylip.

UNIT-II: SPECTROSCOPY

Absorption and Emission principles - Principle and application of UV-visible, Spectroflurometer, flame photometer, Atomic Absorption and emission spectrophotometers, NMR and Mass spectrometer in Biology.

UNIT-III: CHROMATOGRAPHY & ELECTROPHORESIS

Principles and Application of Chromatography: Paper, Thin layer, column, Ion Exchange, Gel filtration, Gas Liquid, HPLC and affinity.

Principles and Application of Electrophoresis: Paper, Agarose, PAGE, SDS PAGE and Iso-Electric focusing.

UNIT-IV: MICROSCOPY

Principles, construction and biological uses of phase contrast, fluorescence, scanning and transmission electron microscopes.

UNIT-V: PREPARATION OF MANUSCRIPTS

Preparation of index cards-Reference collection - preparation of thesis - preparation of Scientific paper for publication in a Journal. Internet and e-journals. Computer aided techniques for data analysis, data presentation and slide preparation.

REFERENCE BOOKS

1. Anderson, Durston and Polle.1970. Thesis and Assignment writing. Wiley Eastern Ltd., New Delhi.
2. Comir and Peter Wood Ford.1979. Writing scientific papers in English. Pitman Medical Publishing Co., London.
3. Ewing, G.W. 1988. Instrumental methods of chemical analysis, McGraw Hill Book Company.
4. Daniel, M. 1989. Basic biophysics for biologists. Agro-Botanical Publishers, India.
5. Skoog, A., Douglas, J. and Leary, J.J. 1992. Principles of Instrumental Analysis. Sanders Golden Sunberst Series, Philadelphia.
6. Day, R.A. 1994. How to write and publish a scientific paper. Cambridge University Press, London.
7. Palanichamy, S. and M. Shanmugavelu.1997. Research methods in biological sciences. Palani Paramount Publications, Tamil Nadu, India.
8. Wilson and Walker. 2000. Practical biochemistry - principles and techniques. Cambridge University Press.
9. Milton, J.S. 1992. Statistical methods in Biological and Health Sciences. McGraw Hill Inc., New York.
10. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.
11. Gurumani, N. 2006. Research Methodology for Biological Sciences. MJP Publishers, Chennai.
12. Veerakumari, L. 2006. Bioinstrumentation. MJP Publishers, Chennai.

PROJECT/DISSERTATION WITH VIVA VOCE

(For those choosing this Paper, the Main Practical 4: is compulsory)

Objectives

To promote original thinking, insemination of knowledge, modulation and innovation of thought, as an exercise, in order to transport the young minds to the expanding horizon of their chosen area of knowledge and transform them into knowledge generators.

Project / Dissertation

75 Marks

Viva voce

25 Marks

PAPER-11

EVOLUTION

(This Core Paper is compulsory for those not choosing Project / Dissertation with *Viva Voce*)

OBJECTIVES

To understand the concepts of animal evolution through evidences, process and products.

UNIT-I: EVIDENCES

Evidences: The need of evidences for the fact of evolution - evidences from comparative anatomy, embryology, physiology and biochemistry - visual pigments, hemoglobin, protein sequences in phylogeny.

Biogeography, Plate tectonics and continental drift - Evidences from systematic, evolutionary taxonomy - Evidences from paleontology - evolutionary trends in fossils, types of fossils. Process of fossilization - Evolution of homeotherms - Evidences from genetics - gene and chromosome homology, hybridization, universality of the genetic code.

UNIT-II: MECHANISM OF EVOLUTION

Mutationism - Views of De Vries and of R.B. Golschmidt; hopeful monsters. Inadequacies of mutationism.

Lamarckism - Life of Lamarck - Lamarckian postulates - inadequacies of Lamarckism.

Natural selection - In nature and laboratory - Creative aspects of natural selection - modern understanding of selection, stabilizing and diversifying and directional selection.

Adaptation - Nature and types of adaptation - Adaptive trends - Quantifying adaptation - Batesian and Mullerian mimicry and evolution.

Polymorphism - Transient and stable - Maintenance of polymorphism.

UNIT-III: GENETIC BASIS OF EVOLUTION AND SPECIATION

Mutations and their role in evolution - the neutralist hypothesis - population size and evolution - the role of genetic drift - hybridization and evolution - The role of polyploidy, isolating mechanisms - premating, post mating - problems of the origin of isolating mechanism.

Structure of species - Clones, peripheral population isolates,

Genetics and Ecology of speciations. Mayer's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation.

UNIT-IV: ORIGIN OF HIGHER TAXA - I

Definition Simpson's definition of the higher taxa - Evidence for the origin of higher taxa from living forms - Evidences for the origin of higher taxa from the fossil record.

Mechanisms in the origin of higher taxa Polyploidy - Deviation, Allometry - Carcinogenesis followed by neoteny.

UNIT-V: ORIGIN OF HIGHER TAXA - II

Modes of origin of higher taxa (1) Mosaic mode. Connecting links between vertebrate classes, (2) Quantum evolution. Simpson's adaptive grid.

Rate of evolution Horotely, Bradytely and Tachytely. Gradualism versus punctuated equilibrium - Extinction and its causes.

HUMAN EVOLUTION

Sociobiology Definition and scope - selfish gene, altruism and kin selection bioethics.

REFERENCE BOOKS

1. P.A.Moody. 1978. Introduction to Evolution. Harper International.
2. G.L. Stebbins. 1979. Process of Organic Evolution. Prentice Hall India, New Delhi.
3. E.O.Dodson. 1990. Evolution. Reinhold, New York.
4. D.S.Bendall. 1983. Evolution from molecules to man. Cambridge University Press.UK
5. M. Grene. 1983. Dimensions of Darwinism. Cambridge University Press. UK
6. E.C.Minkoff. 1984. Evolutionary Biology. Addison - Wesley. London.
7. Montagu. 1980. Sociobiology examined. Oxford University press.
8. Abraham, J.C.B. 1987. Evolution: A Laboratory Manual. Macmillan India Ltd., Madras.

PAPER-12

ENTOMOLOGY

OBJECTIVES

To gain knowledge of insects. Economic importance of insects related to beneficial insects, sericulture, insect pests and their control and vector borne diseases.

UNIT-I: CLASSIFICATION

Classification of insects upto order with examples.

UNIT-II: BENEFICIAL INSECTS

Biology of honey bees, lac insects and their management.

UNIT-III: SERICULTURE

Prospects of sericulture, Biology of silkworm (Nutrition, Genetics, Endocrinology, Reproduction, Pest and Diseases).

UNIT-IV: INSECT PESTS AND THEIR CONTROL

Insects as crop pests: Types of injuries and loss caused to plants in general. Factors governing the outbreak of pests.

Principles and methods of pest suppression: Natural, Cultural, mechanical, physical, chemical, Biological and Integrated pest management.

UNIT-V: INSECTS AS VECTORS

Vector borne diseases: Method of transmission of parasitic agents with special reference to mosquitoes and houseflies.

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9. Chapman, R.F. 1988. The insect structure and Function. Cambridge University Press, U.K.
10. Richards, O.W. and Davies, R.G. 1997. Imm's General Text Book of Entomology Tenth Edition. Vol I and II. R.I Publications, New Delhi.
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13. Ramakrishna Ayyar T.V. 1989. Handbook of Economic Entomology for South India. Books and Periodicals Supply Service, New Delhi.
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17. Patton. W.S. and Cragg F.W. 1981. A Text Book of Medical Entomology. International Books and Periodicals Supply Service, New Delhi.
18. Rathinaswamy, T.K. 1986. Medical Entomology. S. Viswanathan and Co., Madras.
19. Sundari, M.S.N. and Santhi, R. 2006. Entomology. MJP Publishers, Chennai.

ELECTIVE

PAPER -4

(to Choose either A or B)

A. SERICULTURE

OBJECTIVES

To know the Biology of silkworm, their economic importance and methods in sericulture. To develop sericulture is a need based curriculum.

UNIT -I: ECONOMIC IMPORTANCE AND SILKWORM BIOLOGY

Prospects and status - Silk producing species - their distribution - *Bombyx mori* - life cycle - organization of larvae, pupae and moth - structure of the silk gland.

UNIT-II: MORICULTURE

Mulberry - varieties - distribution - methods of cultivation and preparation - Harvest - Transport and preservation of leaves. Feeding and nutrition - specificity of diet - Factors of nutrition - Diet and growth. Pest and diseases.

UNIT-III: SILKWORM REPRODUCTION AND GENETICS

Reproduction - Growth and Development of silkworms - Physiology of molting in different varieties (Uni, bi and multivoltine) - Endocrinology of reproduction and development. Genetics - mutation breeding and development of new strains.

UNIT-IV: PATHOGENIC DISEASES AND PEST

Pathology - Viral, bacterial, fungi and protozoan diseases - control mechanisms. Uzi fly menace.

UNIT-V: SILKWORM REARING AND SILK REELING

Rearing operations - Selection and construction of rearing house Incubation - Hatching - brooding, Harvesting etc. Reeling techniques - lacing skinning. Re-reeling etc.

REFERENCE BOOKS

1. Ganga, G. and Sulochana Chetty, J. 1997. An Introduction to Sericulture. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G. 2003. Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Hisao Aruga. 1994. Principles of Sericulture (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
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9. Wu Pang-Chuan and Chen Da-Chuang. 1994. Silkworm Rearing - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
10. Lu Yup-Lian and Liu-Fu-an. 1991. Silkworm Diseases - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

PAPER -4

B. MICROBIOLOGY

OBJECTIVES

To acquire a basic knowledge of the environmental, medical and industrial important microbes in particular in order to have an integrated approach in biology. Also, to know the basics of sterilization and culture methods in microbiology.

UNIT-I: STRUCTURE AND CLASSIFICATION

Structure and classification of virus, bacteria and fungi.

UNIT-II: STERILIZATION AND CULTURE

Sterilization: Principles - dry heat, moist heat, filtration, Tantilization, pasteurization, Radiation - disinfection.

Culture techniques - media preparation - Aerobic and anaerobic culture techniques - Wet mount, hanging drop, Staining methods, dyes, simple differential and special staining techniques - acid fast stain, spore stain, capsule stain, staining for pure and mixed cultures.

UNIT-III: ENVIRONMENTAL MICROBIOLOGY

Microbial ecology, role of microorganisms in the productivity of ecosystems - Interactions between microorganisms and plants and animal . Microbiology of soil, water and air.

UNIT-IV: MEDICAL MICROBIOLOGY

Pathogenic microbes of bacterial, viral, fungal and protozoan diseases - cure, control and prevention. Antimicrobial chemotherapy - Antibiotics - Source - Classification Mode of action.

UNIT-V: INDUSTRIAL MICROBIOLOGY

Industrial microbiology - Industrial uses of microbes - fermentation products, bioconversions - bioremediation. Products of industrial microbiology - Penicillin, fuel ethanol, vinegar, vitamin B12, citric acid, glutamic acid, protease. Food and Dairy microbiology - Microbes in food - Role of microbes in food production. Dairy and non-dairy products - fermented foods and alcoholic beverages. Pharmaceuticals (antibiotics, vaccines etc.)

REFERENCE BOOKS

1. Tortora, G.J., Funke, R.B. and Case, C.L. 1992. Microbiology - An Introduction. The Benjamin / Cummings Publishing Co., Inc. Sydney.
2. Black, J.G. 1999. Microbiology - Principles and Explorations. John Wiley and Sons Inc. New York.
3. Atlas, R.M. 1995. Principles of Microbiology. Mosby - Year Book Inc.
4. Pelczar, M.J., Reid, R.D. and Chan, E.C.S. 1996. Microbiology. Tata McGraw Hill Co., Ltd. New Delhi.
5. Prescott L.M. Harley J.O. Klein D.A. 1990. Microbiology. WCB Publishers, Sydney.
6. Ananthanaryanan, T. and Paniker, J.C.K. 2000. Text Book of Microbiology Oriental Longman Ltd., Madras.
7. Ahmed, M. and Basumatary. S.K. 2006. Applied Microbiology. MJP Publishers, Chennai.

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

PHYSIOLOGY

1. Estimation of RQ in Fish with reference to Light and temperature.
2. Salt loss and salt gain in fish
3. Estimation of Proteins, Carbohydrates and Lipids in the tissues of Fish
4. Estimation of Blood Urea and Cholesterol.
5. Blood Clotting Time, Bleeding Time, Rouleaux Formation, Preparation of Haemin Crystal.
6. Principle and Application of Sphygmomanometer, Kymograph, Electrophoresis, Haemoglobinometer, ESR.
7. Estimation of Haemoglobin and ESR.

DEVELOPMENTAL BIOLOGY

1. Different stages in development - frog (egg, cleavage, Blastula, Yolk plug stage 24,48,72,96 h Gastrula)
2. Development of chick stage - slide showing C.S.of heart, kidney lens and limb.
3. Slides showing the uterine cycles in a mammal (Rat).
4. Study of slides showing of larval forms: Nauplius, Zoea, Bipinnaria, Leptocephalus.

IMMUNOLOGY

1. Haemagglutination - Quantitative analysis - haemagglutination titration.
2. Preparation of Antigen - RBC - Demonstration.
3. Ouchterlony technique - Demonstration.
4. Immunoelectrophoresis - Demonstration.
5. Slides showing T.S of Spleen, Thymus, lymphnodes and Bones

MAIN PRACTICAL 4

RESEARCH METHODOLOGY, EVOLUTION AND ENTOMOLOGY

RESEARCH METHODOLOGY

1. Problems relating to test of significance (Chi - square test and t - test)
2. Problems relating to correlation, regression and ANOVA.
3. Familiarization of biological and bioinformatics web sites.
4. BLAST search for similar nucleotide sequences.
5. Spectrophotometric estimation of any biological constituent.
6. Electrophoresis - Paper / Agarose gel / PAGE
7. Preparation of index and reference cards.

EVOLUTION (Slides / Specimens / Xerox)

1. Observation of forelimbs and hindlimbs of vertebrates (Frog, Calotes, Bird and Mammal) to study the common pattern of pentadactyl limb and common ancestry of vertebrates.
2. Observation of fossils to study paleontological evidences of evolution.
3. Observation of leaf insects and stick insects in the museum to study adaptation by cryptic colouration and natural selection.
4. Observation of Monarch and Viceroy butterflies to study Batesian mimicry.

ENTOMOLOGY

1. Study of morphology of an insect (local insects to be used).
2. Dissection of digestive, nervous, excretory, reproductive systems of any two insects of different orders.
3. Mounting of different types of mouthparts.
4.
 - a. Field study to collect insect species
 - b. Identification of at least 10 insects belonging to different orders.
5.
 - a. Field study for various methods of pest management.
 - b. Field visit to warehouses and Plant protection centres.

ELECTIVE

PRACTICAL-2

(to choose either A or B)

A.SERICULTURE

1. Study of external morphology of silkworm moth, larvae and pupae.
2. Dissections of digestive and nervous systems in Bombyxmori larvae.
3. Mounting of Silk glands of Silkworm.
4. Study of silkworm rearing and reeling operations (Field visit)
5. Study of silkworm pathology: viral - bacterial - fungal diseases (Field visit - Slides/Specimens /Xerox)

ELECTIVE

PRACTICAL-2

B. MICROBIOLOGY

1. Microscopic observation and identification of microorganisms in Pond water.
2. Types of bacteriophage, bacteria, fungi and algae from the prepared slides / photographs from the book.
3. Collection and Identification of fungus: Bread mould and Coconut mould.
4. Identification of parasitic protozoans (e.g. Plasmodium, Entamoeba, Trypanosoma, Leishmania donovani)
5. Identification of bacteria - staining methods - Gram positive and Gram negative bacteria.
6. Demonstration of
 - a. Isolation of single colonies streak plate and serial dilution.
 - b. Enumeration of microorganisms spread plate and pour plate methods.
 - c. Preparation techniques of culture medium for bacterial growth

THIRUVALLUVAR UNIVERSITY
MASTER OF SOCIAL WORK
DEGREE COURSE UNDER CBCS
(with effect from 2017-2018)

The course Structure and the Scheme of Examination

SEMESTER - I

| S.No | Study Components | | Ins. Hrs./ Week | Credit | Title of the Paper | Max. Marks | | |
|------------|------------------|-------------|-----------------|--------|---------------------------------------|------------|-----------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| SEMESTER I | | | | | | | | |
| 1. | Main | Paper-1 | 6 | 4 | Social Work Practice with Individuals | 25 | 75 | 100 |
| 2. | Main | Paper-2 | 6 | 4 | Social Work Practice with Groups | 25 | 75 | 100 |
| 3. | Main | Paper-3 | 6 | 4 | Social Work Practice with Communities | 25 | 75 | 100 |
| 4. | Main | Paper-4 | 6 | 3 | Psychology | 25 | 75 | 100 |
| 5. | Main | Paper-5 | 6 | 3 | Sociology | 25 | 75 | 100 |
| 6. | Main Practical | Practical-1 | 2 days* | 5 | Concurrent Field Work I | 40 | 60 | 100 |
| | | | | 23 | | | | 600 |

* 15 Hours of Field Work in 2 days per week

SEMESTER II

| S.No | Study Components | | Ins. Hrs./Week | Credit | Title of the Paper | Max. Marks | | |
|------|---------------------------|-------------|----------------|--------|---|------------|-----------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| 7. | Main | Paper-6 | 6 | 4 | Research Methodology | 25 | 75 | 100 |
| 8. | Main | Paper-7 | 6 | 4 | Social Welfare Administration | 25 | 75 | 100 |
| 9. | Main | Paper-8 | 6 | 4 | Social Policy and Social Legislation | 25 | 75 | 100 |
| 10. | Elective | Paper-1 | 6 | 3 | Environment Social Work/Project Monitoring and Evaluation/Social Entrepreneurship | 25 | 75 | 100 |
| 11. | Compulsory Paper | | 6 | 2 | Human Rights | 25 | 75 | 100 |
| 12. | Main Practical | Practical-2 | 2 days* | 5 | Concurrent Field Work II | 40 | 60 | 100 |
| 13. | Main Practical (Required) | | **One Month | 5 | Block Field Work I | - | | |
| | | | | 27 | | | | 600 |

* 15 Hours of Field Work in 2 days per week

**Minimum 24 working days - Only Report Submission – No exams

SEMESTER III

| S.No | Study Components | | Ins. Hrs./ Week | Crediti | Title of the Paper | Max. Marks | | |
|------|---------------------|--------------|-----------------|---------|--|------------|-----------|-------|
| | Course Title | | | | | CI A | Uni. Exam | Total |
| 14. | Main-Specialization | Paper-9 | 6 | 4 | Human Resource Management/ Rural and Urban Community Development/Mental Health and Psychiatric Social Work | 25 | 75 | 100 |
| 15. | Main-Specialization | Paper-10 | 6 | 4 | Labor Legislation and Labor Welfare/Rural and Urban Governance /Medical Social Work | 25 | 75 | 100 |
| 16. | Skills Paper | Skill-1 | 6 | 2 | Life Skills | 25 | 75 | 100 |
| 17. | Main Practical | Practical- 3 | 2 Days* | 5 | Concurrent Field Work III | 40 | 60 | 100 |
| 18. | Elective | Paper-2 | 6 | 3 | Computer Application in Social Work/Hotel Front Office Management/ Disability and Social Work | 25 | 75 | 100 |
| | | | | 18 | | | | 500 |

* 15 Hours of Field Work in 2 days per week

SEMESTER IV

| S.No | Study Components | | Ins. hrs./Week | Credit | Title of the Paper | Max. Marks | | |
|------|---------------------|-------------|-------------------|--------|--|------------|--------------|-------|
| | Course Title | | | | | CIA | Uni. Exam | Total |
| 19. | Main-Specialization | Paper-11 | 6 | 4 | Organizational Behaviour/Development Strategies/Clinical Social Work | 25 | 75 | 100 |
| 20. | Main-Specialization | Paper-12 | 9 | 4 | Industrial Relations/Livelihood and Social Audit /Therapeutic Interventions in Social Work | 25 | 75 | 100 |
| 21. | Elective | Paper-3 | 6 | 3 | Disaster Management/Corporate Social Responsibility/Hospital Administration | 25 | 75 | 100 |
| 22. | Main Practical | Practical-4 | 2 Days* | 5 | Concurrent Field Work IV | 40 | 60 | 100 |
| 23. | Main | Project | 6 | 6 | Research Project | 25 | 75 | 100 |
| | | | | 22 | | | | 500 |

* 15 Hours of Field Work in 2 days per week

Note:

Concurrent Field Work Training - Social Work is a skill oriented subject where Field Work training is an important component. Concurrent field work training is provided to the students in each semester. The students spend 2 full days per week (15 working hours per week) for the field work training. At the end of the semester Field work viva is conducted by an external examiner.

Block Field Work Training – During the fourth semester students have to compulsorily do Block Placement training for one month (minimum 24 working days) in the field placement agency. The students have to submit the Field Work Record, Activity sheet signed by Agency Supervisor and Attendance certificate from the agency after the successful completion of this training. A separate viva is conducted for this Block Field Work by the department (Internally) and only credits are allotted. Marks are not given for block field work training.

Research Project Work - The research project is carried out during the third semester. The Project Report may consist of 75 to 100 pages. The candidate has to submit the Research Project Report 15 days before the commencement of the III Semester Examinations and appear for the viva voce examination. The project is valued for 75 marks in the semester end examination. The student submits the approved chapters as a bound volume. The project is valued for 75 marks in the semester end examination. The viva voce examination will be conducted by both the external examiner appointed by the university and the internal examiner/guide/teacher concerned. The average of the marks awarded in the viva voce by both the external examiner and the internal examiner will be intimated to the university along with the marks obtained by the candidate in the CIA.

| Subject | Papers | Credits | Total Credits | Marks | Total Marks |
|-----------------------|--------|---------|---------------|-------|-------------|
| Main | 12 | 3-4 | 46 | 100 | 1200 |
| Main Practical | 4 | 5 | 20 | 100 | 400 |
| Main Research Project | 1 | 6 | 6 | 100 | |
| Electives | 3 | 3 | 9 | 100 | 300 |
| Compulsory Paper | 1 | 2 | 2 | 100 | 100 |
| Skills Paper | 1 | 2 | 2 | 100 | 100 |
| Block Field Work | 1 | 5 | 5 | --- | ---- |
| Total | 23 | - | 90 | 2200 | 2200 |

THIRUVALLUVAR UNIVERSITY
MASTER OF SOCIAL WORK
SYLLABUS
UNDER CBCS
(with effect from 2016-2017)
SEMESTER I

PAPER - 1

SOCIAL WORK PRACTICE WITH INDIVIDUALS

Learning Outcome: *The students will...*

- Gain knowledge about the primary method of social work practice with individuals
- Understand the techniques and approaches of social work practice with individuals
- Acquire the skill of working with individuals

UNIT 1: Social Casework- Concept & Definition. Historical development of Social Casework. Objectives of working with individuals. Principles of social casework practice- Individualization, Purposeful expression of feelings, controlled emotional involvement, Acceptance, Non-judgmental attitude, Client self-determination and Confidentiality. Components of Casework (Perlman's model)-Person, Problem, Place and Process.

UNIT 2: Casework Process: Phase 1: Exploration of person in environment, Multidimensional assessment and Planning, Multidimensional intervention. Phase 2: Implementing and Goal attainment. Phase 3: Termination and Evaluation; Follow up. Interview – Home visits, Collateral contacts, Referrals.

UNIT 3: Case Worker - Client Relationship: Characteristics of professional relationship: empathy, non-possessive warmth, genuineness and self-disclosure; Obstacles in client worker relationship: Transference, Counter transference and Resistance.

UNIT 4: Techniques in Practice- Ventilation, emotional support, action oriented support, advocacy, environment modification, modeling, role-playing and confrontation. Tools - Observation, listening, communication, rapport building, questioning, giving feedback. Record keeping – Face sheet, Narrative, Process and Summary recording. Use of genogram and eco map- Case presentation as tool of professional development.

UNIT 5: Casework Practice: Approaches and Models - Psycho Social approach, Person Centred approach, Problem Solving approach and Crisis Intervention model. Relevance of an Eclectic approach. Working with Individuals in different settings: Educational, Family and Child Welfare, Medical and psychiatric, Correctional and Industrial setting.

Reference

1. Bhattacharya, Sanjay. 2009. Social Case Work Administration and Development. Rawat Publications. New Delhi.
2. Elizabeth A Segal, et.al. 2010. Professional Social Work. Cengage Learning India Pvt. Ltd. India.
3. Helen Harris Pearlman, (1968), Social Casework A Problem Solving Process, The University Of Chicago.
4. Jainendra Kumar Jha (2002), Social Welfare and Social Work, J.L. Kumar for Anmol Publications Pvt. Ltd. New Delhi.
5. Kottles A. Jeffrey, David S., Shepard. 2009. Counseling Theories and Practice. Cengage Learning India Pvt. Ltd. New Delhi.
6. Mamta Sehgal, Nirmala Sherjung (1997), Marital Disputes & Counselling Remedial Measures-Vol 3, APH Publishing Corporation-New Delhi.
7. Mathew, Grace. 1992. An introduction to Social Case Work. Tata Institute of Social Sciences.
8. Mujawar W.R., N.K. Sadar. 2010. Field Work Training in Social Work. Mangalam Publications. New Delhi.
9. Perlman Helan Haris. 2011. Social Case Work – Problem Solving Process. Rawat Publications. India.
10. Philip Burnard (2009) Counselling Skills Training Book Of Activities, Viva Books- New Delhi.
11. Upadhya, R. K. 2010. Social Case Work A Therapeutic Approach. Rawat Publications. New Delhi.

Paper-2**SOCIAL WORK PRACTICE WITH GROUPS**

Learning Outcome: *The students will...*

- Gain knowledge about the primary method of social work practice with groups
- Understand the techniques and approaches of social work practice with groups
- Acquire the skill of working with groups

UNIT –I: Understanding Concepts of Social Group Work: Concept of group and its importance of groups in human life cycle; Group is an Instrument of Change; Definition of social group work; Characteristics of social group work; History and development of social group work.

UNIT–II: Group Process and Dynamics group process, group interaction, Leadership and its development in group process, Communication in group- Verbal and non-verbal communication; Group dynamics: - group bond, sub-groups, group conflict, confrontation, apathy and group control; Importance of relationship; Conflict resolution;

UNIT-III Social Group Work Method & Group Work Process : Values and distinctive principles of Group Work; Types of groups in social group work practice- open and closed groups, social treatment groups, task oriented groups (forum, committees and work team), developmental groups (self help groups and support groups) and Recreational Groups; Group Work Process: Tuckman (1965), and Rogers (1967) model: Forming, Storming, Norming, Performing and Mourning (Deforming). Role of social worker in different stages of group development.

UNIT-IV Use of Programme in Social Group Work & Skills of Group Worker: Concept of programme, Principles of programme planning, Importance of programme in group work practice, Programme planning and implementation for group development- Skills for Social Group work - Social group work practice in different settings.

UNIT –V Recording in Group Work & Evaluation of Group Work :Importance of recording in group work, Principles of recording, Types of recording- , Techniques of recording –observation, sociogram, interaction diagrams- Bale's categories of interaction process analysis- Importance of continuous evaluation in group work, Types of evaluation- Methods of evaluation

References:

1. Charles Zastrow H, Msw , Ph.D, 2009, Social Work With Groups, Cengage Learning Publication, Australia
2. Gerald Corey, Marianne Schneider Corey, Patrick Callanan, Michael J. Michael Russell, 1992, Group Techniques, Brooks, And Cole Publication Company Pacific Hare, California
3. Harlrich Trecker B, 1955, Social Group Work Methods And Principles
4. Ken Heap, 1985, The Practice Of Social Work With Group George Allen And Unwin Publication Ltd, London
5. Marianne Schneider Corey And Gerald Corey, 1992, Groups Process And Practice, Brooks And Cole Publication Company, California
6. Ronald W, Tosland, 2005, An Introduction To Group Work Practice, Pearson Publication, London, New York
7. Sahu R. K , 2010, Group Dynamics And Team Building, Excel Books, New Delhi
8. Siddiqui , 2008, Group Work Theoretical Practices, Rawat Publication, Jaipur
9. Steven Rose .R , 1998, Group Work With Children And Adolescents, Sage Publications, New Delhi
10. Tom Douglas, 1993, A Theory Of Group Work Practice, Palgrave Macmillan Printing, London.
11. Tom Douglas, 1976, Group work Practice, Tavistock Publication Ltd, London,

Paper – 3**SOCIAL WORK PRACTICE WITH COMMUNITIES**

Learning Outcome: *the students will*

- Gain knowledge about the primary method of social work practice with communities
- Understand the techniques and approaches of social work practice with communities
- Acquired the skill of working with communities

UNIT 1: Community: Concept, Characteristics and Classification- Community organization: Concept, History, Objectives & Principles. Process of community organization - Study and survey, analysis, assessment, discussion, organization, action, reflection, modification, continuation. Similarities and differences between community organization and community development.

UNIT 2: Models of community organization: locality Development, social planning, social action, Approaches-specific content, general content and process content. Skills in community organization: Communication, training, consultation, public relations, resource mobilization, liaisoning. Community Organisation as a Para – Political Process – Networking, Conscientisation, Planning and Organising, Roles and Strategies of Social movements

UNIT 3: Methods of community organization: Awareness creation, planning and organizing, education, networking, participation, leadership, Community action, legislative and non legislative actions. Application of community organization in rural, urban and tribal settings.

UNIT 4: Social Action in Community Organization: Concept, Purpose and Techniques, Social Action as a method of social work. Approaches to social action – Paulo Friere, Saul Alinsky, Martin Luther King and Ambedkar.

UNIT 5: Strategies and Tactics in Social Action: individual contact, conscientization, negotiation, collaborative pressure, advocacy, legal suasion, public relations, political organization, conflict resolution and violence. Contextual usage of strategies- Roles and Responsibilities of social activists

Reference:

1. Christopher, A.J., and Thomas William. 2006. Community Organization and Social Action. Himalaya Publications. New Delhi.
2. Cox M. Fred et. al. 2005. Strategies of Community Organization. 4th Edition. Peacock Publishers. New Delhi.
3. Jainendra Kumar Jha, 2002, Social Work And Community Development, Anmol Publications Pvt Ltd, New Delhi
4. Johri Pradeep Kumar. 2005. Social Work and Community Development. Anmol Publications Pvt. Ltd. New Delhi.
5. Kumar Jha Jainendra. 2002. Social Work and Community Development. Anmol Publications Pvt. Ltd. New Delhi.
6. Kumar Somesh. 2008. Methods for Community Participation. Vistar Publications. New Delhi.
7. Ledwith Margaret. 2005. Community Development. A Critical Approach. Rawat Publications. New Delhi.
8. Margaret Ledwith, 2005, Community Development, Rawat Publications, Jaipur.
9. Mukundan N. And M.Hilaria Soundari, 2008, Emerging Dimensions In Selp Help Groups, Dominant Publishers And Distributors, New Delhi.
10. N.Lalitha, 2008, Shg's And Micro Finance, Dominant Publishers And Distributors, New Delhi.
11. Pradeep Kumar Johri, 2005, Social Work For Community Development, Anmol Publications Pvt Ltd, New Delhi.
12. Somesh Kumar, 2008, Methods For Community Participation, Vistaar Publications, New Delhi.
13. Surendra K. Vettivel, 1992, Community Participation Empowering The Poorest Roles Of Ngo's, Vetri Publications, New Delhi.

Paper – 4**PSYCHOLOGY**

Learning Outcome: *The students will...*

- Gain basic knowledge on psychology
- Understand the behavior of human beings
- Acquire the skill of using psychological testing tools in dealing with individuals

UNIT 1: Psychology: Concept: Science of mind, Science of behavior-Conscious & Subconscious processes and motivation. Developmental stages & Developmental tasks. Areas of Human Development - Social, emotional, cognitive and physical-Relevance of Psychology to Social Work.

UNIT 2: Psychological Processes in Behavior: Needs and Motives, Emotions, Intelligence, Learning and motivation. Factors Influencing Human Behavior: Heredity and Environment. Personality: types of personality.

UNIT 3: Social Bases of Behavior: Perception -Hallucination, Delusion, Illusion, Attitudes, Prejudices, Biases and Stereotyping. Processes of Adjustment & Mal-adjustment. Coping Mechanisms vs. Defense Mechanism

UNIT 4: Abnormal Psychology: Concepts of normality and abnormality. International Classification of Diseases (ICD): Neurosis & Psychosis. Theories of Human Development: Freud's Psycho-Sexual theory, Erickson's Psycho-social theory and Cognitive Theory of Jean Piaget.

UNIT 5: Intervention methods: Psychological Counseling and Psychological Testing: IQ / Achievement Test and Attitude Test- Basic concept of Psychometrics and Testing.

References:

1. April Lal Mukherjee, 2015, A Textbook Of Cognitive Psychology, Rajat Publications, New Delhi
2. Anuratha Ngangom, 2012, Research Methodology In Psychology, Maxford Books, New Delhi
3. Daine E Papalia And Sally Wendkos Olds And Ruth Duskin Feldman, 2004, Human Development (Ninth), Tata Mcgraw-Hill, New Delhi
4. David F Marks, Michael Murray, Brian Evans And Emeé Vida Estacio, 2011, Health Psychology (Third), Sage Publications, New Delhi
5. Delhinaiima Khatoon, 2012, General Psychology, Darling Kinderley, South Asia .
6. Elizabeth B Hurlock, 2009, Development Psychology (Fifth), Tata Mcgraw-Hill, New Delhi
7. Elizabeth B. Hurlock, 2005, Child Development, Tata Mc Graw-Hill Publishing Company Ltd, New Delhi
8. John W Santrock, 2011, Life Span Development (Thirteen), Tata Mcgraw-Hill, New Delhi
9. Lewis R Aiken And Gary Groth-Marnat, 2009, Psychological Testing And Assessment, Dorling Kindersley Pvt. Ltd, New Delhi
10. Margarete Parrish, 2012, Social Work Perspectives On Human Behaviour, Rawat Publications, Jaipur
11. Mohan Kumar, 2014, Dictionary Of Psychology, Aitbs Publishers, Delhi
12. Naima Khatoon, 2012, General Psychology, Dorling Kindersley Pvt Ltd, India
13. Philip Banyard, Mark N.O. Davies, Christian Norman And Belinda Winder, 2012, Essential Psychology, Sage Publications, New Delhi
14. Singh H.D., 2007, Handbook Of Basic Human Physiology, S.Chand And Company Ltd, New Delhi

Paper – 5**SOCIOLOGY**

Learning Outcome: *The students will...*

- Gain knowledge about the society and its dynamism
- Understand the problems of the society
- Acquire the skills of working with the society

Unit 1: Meaning and Characteristics of Society, Community, Social Group, Social Association and Social Institution. Social Structure and functions of Social Institutions - marriage, family, kinship, caste, religion and education. Linkages between Sociology & Social Work

Unit 2: Socialization: Process and agents. Social control: Concept, types and functions. Major Agents of Social control: Kinship, Religion, Law, Education, Traditions and Customs.

Unit 3: Process of Social Change: Urbanization, Industrialization, Westernization, Sanskritisation, Secularization. Resistance to social change-cultural lag and Ethnocentrism.

Unit 4: Social Movements in India: Concept and Characteristics, Process of social movements - Peasant, Tribal, Dalits, Backward Class, Women, Minority groups, Working Class and Student.

Unit 5: Social Problems: Corruption, Malnourishment, Child Abuse, violence against women & Sexual minorities - Human Trafficking, Communalism, Terrorism and environment degradation.

Reference:

1. Abhijit Dasgupta, 2012, On The Margins: Tribes, Castes And Other Social Categories(Fourth), Sage Publications, New Delhi
2. Anthony Giddens, 1998, Sociology(Third), Polity Press, London
3. Sachdev D.R. And Vidhya Bhushan, 2006, Introduction To Sociology, Kitab Mahal, Allahabad
4. Frank N Magill, 1995, International Encyclopedia Of Sociology, British Library, England
5. Indhira R., 2012, Themes In Sociology Of Education, Sage Publications, New Delhi
6. Jainendra Kumar Jha, 2002, Basic Principles Of Developmental Sociology, Anmol Publications, New Delhi
7. Khare R.S., 2006, Caste, Hierarchy, Individualism, Oxford University Press, New Delhi
8. Mohanty B. B., 2012, Agrarian Change And Mobalization, Sage Publications, New Delhi
9. Sahu D.R., 2012, Sociology Of Social Movement, Sage Publications, New Delhi
10. Shanger Rao C. N, 2012, Sociology Principles Of Sociology With An Introduction To Social Thought, S Chand And Company, New Delhi
11. Surinder S Jodhka, 2012, Changing Caste, Ideology, Identity And Mobility, Sage Publications, New Delhi
12. Thara Bhai L., 2012, Indian Sociology Issues And Challenges, Sage Publications, New Delhi.

Practical – 1**CONCURRENT FIELD WORK – I**

Learning Outcome: *The students will...*

- get exposure with regard to the various settings of social work.
- undergo a group living experience and to understand the living conditions of people.
- Acquire the skill in street theatre and folk lore.

Field Work Components:

1. Observational Visits -The first year students during the first semester go for observational visits to various settings: Medical & Psychiatric, Rural Community Setting, Slum Visits, Industrial Setting, Correctional Setting and Tribal Setting.
2. Street Theatre training
3. Rural Camp for a week
4. Laboratory Experience in Social Work Methods
5. Group Project on Current issues – organized in groups.

The students spend two days in a week and expected to spend a minimum of 15 hours per week in the field for practice based learning.

Every week the students write a report of their activities and submit to the concerned field work supervisor on Mondays. The supervisor conducts individual and group conference regularly.

The CA marks are awarded by the supervisor out of 40 marks for the quality, regularity, initiatives, leadership, participation and team worker.

At the end of the semester Viva Voce is conducted by an external examiner and marks are awarded out of 60.

SEMESTER II**Paper – 6****RESEARCH METHODOLOGY**

Learning Outcome: *The students will...*

- Understand the need and importance of gaining knowledge on research methods and techniques in social work profession.
- Gain knowledge and skills to use the quantitative and qualitative research techniques in social work research methods.
- Understand the usages of computer packages in research

UNIT-I: Scientific attitude, characteristics, scientific method. Research meaning, objectives and types. Social work research, steps of social work research – define, strategy, execution and reporting. Research problem – identification, selection, formulation of research problem. Research proposal preparation.

UNIT-II: Research design- exploratory, descriptive, diagnostic experimental, hypothesis nature and types, assumptions and its nature. Sampling - meaning, types, errors and principles. Research tools – questionnaire, interview schedule, interview guide, observation schedule, standardized tools. Survey – meaning types and steps. Variables – meaning, types and levels of measurement. Reliability and validity.

UNIT-III: Qualitative research – meaning, definition, types, process, and methods – grounded theory, ethnography, participant observation, naturalistic observation, field research, phenomenology, case study, historical method and action research. Methods of collection of data – in depth interview, focus group interview and artifacts. Relationship between qualitative and quantitative research.

UNIT-IV: Data analysis and processing of data - editing, coding, code book preparation, code sheet preparation. Classification, tabulation, frequency distribution, diagrammatic and graphic presentations – interpretation of data.

UNIT-V: Statistics – meaning, types. Measures of central tendency, measures of dispersion. Meaning, usage and application of, correlation, regression, parametric and non parametric tests, testing of hypothesis, ANOVA, Cluster analysis, Factor analysis. (Manual calculations are not emphasized)

Reference:

1. Adams, John et.al. 2009. Research Methods for Graduate Business and Social Science Students. New Delhi: David white.
2. Agarwal. Y.P. 1998. Statistical Methods Concepts Applications and computation. New Delhi: Sterling Publishes Pvt. Ltd.
3. Cargan, Leonard. 2008. Doing Social Research. Jaipur: Rawat Publications.
4. Chadhary, CM. 2009, Research Methodology, Jaipur: Ashish Paranmi Publishers.
5. Debashis, Chakraborty. 2009. Research Methodology. New Delhi: Saurabn Publishing House.
6. Gupta, S. P. 2009. Statistical Methods. New Delhi: Sultan Chand and Sons.
7. Hatt, P.K. and W.J. Goode. 1981. Methods in Social Research. Auckland: McGraw Hill Book Company.
8. 10. Kothari, C.R. 2004. Research Methodology – methods and techniques. New Delhi: New Age International Private Limited.
9. Mark, R. 1994. Research Made Simple. California: Sage Publications.
10. Mattheen, Mark and Nick Foard. 2006. A Short Introduction to Social Research. New Delhi : Vistaar publications,.
11. Padgett, D.L. 1998. Qualitative Methods in Social Work Research. California: Sage Publications.
12. Riessman, C.K. 1994. Qualitative Studies in Social Work Research. California: Sage Publications.
13. Silverman, D. 1993. Interpreting Qualitative Data. London: Sage Publications Ltd.
14. Singh, Kultar. 2007. Quantitative Social Research Methods, New Delhi: Sage Publications India Pvt Ltd..
15. Wilkinson, T.S. 1984. Methodology and Techniques of Social Research. Bombay: Himalaya.
1. Allen Rubin and Earl Babbie, 2011, Methodology For Social Work Research, Cengage Learning India Pvt. Ltd, New Delhi.
2. Cargan, Leonard. 2008. Doing Social Research. Jaipur. Rawat Publications.
3. Chadhary CM. 2009. Research methodology. Ashish Paranmi RBSA publishers. Jaipur.
4. Debashis Chakraborty. 2009. Research Methodology. Saurabn Publishing House. New Delhi.
5. Susanne Friese, 2012 Qualitative Data Analysis with Atlas, Sage Publications, New Delhi.

Paper – 7**SOCIAL WELFARE ADMINISTRATION**

Learning Outcome: *The students will...*

- Gain knowledge about social welfare administration of service organizations.
- Understand welfare programmes of the government.
- Acquire the skill of establishing a human service organisation.

UNIT 1: Welfare State: Concept and relevance. Indian Constitution: Fundamental rights and Directive principles of State Policy- Social Policy and Planned social change. National Policy on Voluntary sector (2007).

UNIT 2: Social Welfare Administration- Concept, Features - Non-Government, Non-Profit making and self –governing organizations. Human Service Organizations by Orientation, by Levels of operation and by Focus.

UNIT 3: Basic Administration Processes: Planning, Organizing, staffing and directing. Elements of Directing: Supervision, motivation, leadership, communication, monitoring and evaluation. Administrative skills – Writing reports, letters and minutes of meetings.

UNIT 4: Finance Administration: Budgeting, accounting and auditing. Maintenance of books and accounts, financial documents and records. Mobilization of financial resources - Grants in Aid. Foreign Contribution and Regulation Act – 1976.Exemption from Income tax.

UNIT 5: Registering of an Organization: Procedures related to registering under Societies Registration Act 1860, Charitable Trust Act 1912 and Indian Companies Act 1956. Administrative Structure – Memorandum, Bye laws, Constitution, Deed, Functions and responsibilities of governing board, committees and office bearers. Major programmes of Central Social Welfare Board and State Social Welfare Board.

References:

1. Batra, Nitin. 2004. Administration of social Welfare in India. Jaipur. Raj Publishing House.
2. Bhattachary, Sanjay. 2009. Social Work Administration and Development. New Delhi. Rawat Publication.
3. Chowdhry, D.Paul. 1992. Social Welfare Administration. Atmaram and Sons.
4. Encyclopaedia of Social Work. Vol I & III Also for Units IV & V
5. Kohli, A.S & S.R. Sharma. 1998. Encyclopedia of Social Welfare and Administration. New Delhi. Anmol Publication.
6. Patel, N Vinod&Rana, K, Girish.2007. Personnel Management. Jaipur. Oxford Book Company.
7. Sarita Sharma, Basotia G. R. Popalia A.K. 1997. Management, Function, financial Planning and Policy. Kanishka Publishers. New Delhi.

Paper – 8**SOCIAL POLICY AND SOCIAL LEGISLATIONS****Learning outcome: The students will....**

- understand social policies in India in terms of themes, trends and deliveries.
- explore the relationship between state, market and civil society in formulating various models of inclusive policies.
- understand the significance of various Social Legislations

UNIT I :Genealogy of Welfare State - Concepts: Rights, Justice, Citizenship, and Welfare State - Relationship between Civil society, State, Governance and Development – various critiques of Welfare State theories - typologies of welfare state regimes – globalization and welfare states.

UNIT II: Introducing Social policy and Social legislation. Post-colonial Welfare State: Policy making processes and structures in India – The role of Executive, Legislature and judiciary-Political parties, Pressure groups, Non-Governmental Organizations, Mass Media. Policy implementation: The role of Governmental agencies - the participation of Non-governmental organizations and citizens participation- Problems in implementation of policy-Analysis of different policies of the Central and State Governments. Liberalism, Globalization and changing nature of social policy in India.

UNIT III: Child Marriage restrained (Amendment) Act, 1978; Child Labour (Prohibition and Regulation) Act, 1986; Central Adoption Resource Agency Guidelines, 1991; Pre Conception and Pre-Natal Diagnostic Techniques Act (Prohibition of Sex Selection), 1994. The Juvenile Justice (Care and Protection of Children), Act 2000; Right of Children to Free and Compulsory Education Act. 2009; Women: Prevention of Immoral Traffic Act, 1956; Dowry Prohibition Act, 1961; Medical Termination of Pregnancy Act, 1978; Indecent Representation of Women Act, 1986; Domestic Violence Act, 2005. Sexual Harassment in Work Place Guidelines.

UNIT IV: Bonded Labour System (Abolition) Act, 1976; The Mental Health Act, 1986; The SC/ST (Prevention of Atrocities) Act, 1989 & Rules 1995, The Persons with Disabilities (Equal Protection of Rights And Opportunity and Full Participation) Act, 1995; The Unorganized Workers' Social Security Act, 2008.

UNIT V : Protection of Human Rights Act, 1993; Consumer Protection Act, 1986; Right to information Act, 2005; The Patents (Amendment) Act, 2005; Rural Employment Guarantee Act, 2005. Public Interest Litigation, Legal Aid in India.

References:

1. Alcock, A.Erskine and .May (eds), The Student's Companion to Social Policy, 2nd edition, Blackwell, 2003
2. Clasen, J. (ed.) (1999) Comparative Social Policy: Concepts, Theories and Methods, Oxford: Blackwell
3. James Midgley and Michelle Livermore (eds), The Handbook of Social Policy, Sage Publication, 2009
4. Harihar Bhattacharya, Partha sarkar and Angshuman Kar (eds) (2009) The Politics of Social Exclusion in India: Democracy at the Crossroads, Routledge, 2009
5. Kurien, Growth and Justice, Oxford University Press, Madras, 1992
6. Lewis, Gail et al (ed.) Rethinking Social Policy, London: Sage, 2000
7. Marshall, T.H. (1975) Social Policy in the Twentieth Century, London: Hutchinson & Co
8. Pierson, Christopher and Castles, Francis (ed), The Welfare State: Reader, Cambridge: Polity Press 2006
9. Sainsbury, D. (ed.) (1999) Gender and Welfare Regimes, Oxford: Oxford University Press.
10. Sundarum, R.M., Growth and Income Distribution in India: Policy and Performance since Independence, Sage, New Delhi, 1987.
11. Vivekanandan, B. and Nimmi Kurian (eds) (2005) Welfare State and the Future, Hampshire: Palgrave Macmillan
12. Williams (1989) Social Policy: A Critical Introduction, Polity Press

Elective Paper – 1**ENVIRONMENTAL SOCIAL WORK****Learning Outcome: The students will....**

- learn basic facts about Ecology, Environment and Energy resources.
- gain knowledge on various issues on Environment and the roles of Movements for the Environment Protection.
- Understand the roles and responsibilities of Social Workers to protect the nature.

UNIT – I: Environmental Issues and Consciousness: Environment degradation and pollution of Natural Resources- Air, Soil, Water, Population, Sanitation, Housing, Encroachments over Common Property Resources, Energy crisis and Rural Poverty.

UNIT –II: Environment Consciousness- NGOs, Social Workers and Ecological Movements : Global level, People's initiatives to save their environment- Chipko Movement - Save forests movement –Mitti Bachao Andolan - Movements against big dams-Narmada and Tehri - Eco farming- Natural farming efforts.

UNIT – III: Environment Action and Management: State and the Environment preservation - Rio Summit and its implications - Government Policies and programmes - Grassroots Organization - Women and Conservation of Environment -Panchyats and Environment. Environment Management: Role of Traditional - State controlled - people controlled and Jointly managed systems - Waste Management.

UNIT – IV: Environment Protection Laws and Role of Social Worker: The Environment Protection Act 1986 - Air Pollution Act 1987 - Water Pollution Act 1974. Power and functions of Central and State Pollution Control Boards: Type of offences by companies, procedures, and penalties. (Latest amendments may be considered while teaching these laws).

UNIT – V: Acts related to environmental protection: Forest conservation, Standards and tolerance levels – Unplanned urbanization- Environmental movements in India - Role of NGOs in Environmental issues – Government agencies in environmental protection – Social work initiatives at different levels.

References:

1. Abbasi. S.A. 1998. Renewable energy sources and their Environmental Impact. Prentice Hall London.
2. Agarwal S.K. 1993. Environmental protection. Himalaya Publishers, New Delhi.
3. Andromeda. 1995. New Science encyclopedia: Ecology and environment. Oxford Publishers. London
4. Benny Joseph. 2005. Environmental studies. Tata McGraw Hill Publishers. New Delhi:
5. Cutter Susan L. 1998. Environmental Risks and Hazards. Prentice Hall London.
6. Dash Sharma P. 1998. Environment Health and development. Anmol Publishers. New Delhi.
7. Gadgil, Madhav and RamchandraGuha, 1995 Ecology and Equity; the use and Abuse of Nature in Contemporary India, New Delhi, Penguin Publishers.
8. GuhaRamchandra, 1991 The Unquiet woods, Ecological Change and Peasant Resistance in the Himalayas, New Delhi: Oxford University Press
9. Gupta Sunil. 1997. Environment Population and resources. Anmol Publishers. New Delhi.
10. Kannan 1991. Fundamentals of Environmental pollution. S. Chand. New Delhi.
11. Krishan. 1994. Fundamentals of Environmental pollution. S. Chand and Company. New Delhi
12. Luoma Samuel N. 1984. Introduction to environmental Issues. Macmillan Publishers. Calcutta.

Elective Paper-1
PROJECT MONITORING AND EVALUATION

Learning Outcome: The students will gain...

- Knowledge about monitoring and evaluation systems and their use in project cycle management
- Learn methods and skills to carry out monitoring using logframe matrix
- Knowledge to plan and carry out evaluation studies and measure the results of the project

Unit 1 – Monitoring & Evaluation – Definitions & Concept – Difference between monitoring and evaluation -Importance of monitoring & evaluation in Project Cycle Management – The Log Frame Analysis - Formulating Objectives - Defining Activities.

Unit 2 - Monitoring and Evaluation Framework with baseline and target- Indicators- Designing measurable indicators for goal, outcomes and outputs.

Unit 3 - Monitoring - Types of monitoring - Monitoring Activities and Outputs -Monitoring Outcomes and Assumptions-Preparation of monitoring forms-Data collection/processing/analysis and reporting- Implementation of recommendations.

Unit 4 – Evaluation - Formative and Summative Evaluation - Internal & External Evaluation - Internal evaluation process- Methodology - Preparation of terms of reference/forms- Data collection/processing/analyzing.

Unit 5 - External evaluation- Evaluation of Government schemes and programmes - Writing an effective Evaluation report- Communication of findings for action and accountability.

Reference:

1. Barton, T. (1997). Guidelines for Monitoring and Evaluation – How are we doing? CARE International Uganda
2. Casley D J and Kumar K (1988) The Collection, Analysis, and Use of Monitoring and Evaluation Data, A Joint Study by The World Bank, IFAD and FAO, London: The John Hopkins University Press
3. Curry S and Weiss J (2000) Project Analysis in Developing Countries, Second Edition, Basingstoke: MacMillan Press
4. DFID (1995) Stakeholder Participation and Analysis, London: Social Development Division, DFID
5. Feuerstein M-T (1986) Partners in Evaluation, Evaluating development and community programmes with participants, London: MacMillan Education.
6. Guijt, Irene; Jim Woodhill 2002. Managing for Impact in Rural Development: A Guide for Project M&E. International Fund for Agricultural Development.
7. Handbook on Monitoring and Evaluating for Results, Evaluation Office, UNDP, 2002
8. Margoluis, R. and Salafsky, N. (1998). Measures of Success: Designing, Managing, and Monitoring Conservation and Development Interventions. Island Press: USA.
9. Margoluis, R. and Salafsky, N. (1998). Measures of Success: Designing, Managing, and Monitoring.
10. Roche, Chris (2004). Impact Assessment for Development Agencies. Oxfam, London.

Elective Paper-1**SOCIAL ENTREPRENEURSHIP**

Learning Outcome: *The student will....*

- develop understanding about social entrepreneurship.
- get exposure to the social enterprises.
- strengthen the competence in social entrepreneurship

UNIT 1: Need and importance of Third Sector in development. Typologies of third sector –Voluntary, NGO, NPO, CBO, CSO, Growth of third sector in India –Performance and environment of third sector. Third sector relationship to state and civil society.

UNIT 2: Concept, Definition, Importance of social entrepreneurship –Social entrepreneurship Vs business entrepreneurship –social entrepreneurs and social change –qualities and traits of social entrepreneurs. Indian social entrepreneurs –M.S. Swaminathan, Varghease Kurien and Jockin Arputham.

UNIT 3: Concept, Definition, Importance of social enterprises– similarities and differences between social enterprises and non profits – types of social enterprises. Selected case studies of Indian Social Enterprises.

UNIT 4: Global & National environment to promote social enterprises and social entrepreneurship. Financial Management of social enterprises – Corporate, Community and government support for social enterprises.

UNIT 5: Application of marketing principles in welfare and development field – Social marketing. Social Entrepreneurship - in the field of Health, Education, Environment protection, Energy consumption and Human rights.

References

1. Alex Nicholls, (2006), Social Entrepreneurship: New Models of Sustainable Social Change, New York: Oxford University Press.
2. David Bornstein, (2007). How to Change the World: Social Entrepreneurs and the Power of New Ideas, New York: Oxford University Press.
3. Fred Setterberg, Kary Schulman (1985), Beyond Profit: Complete Guide to Managing the Non Profit Organizations, New York: Harper & Row.
4. Gregory Dees, Jed Emerson, Peter Economy (2002), Enterprising Non Profits –A Toolkit for Social Entrepreneurs, New York: John Wiley and Sons.
5. Peter Drucker (1990), Managing the Non Profits Organizations: Practices and Principles, New York: HarperCollins.

Compulsory Paper**HUMAN RIGHTS****Learning Outcome: The Students will....**

- Understand the concept and theories related to human rights
- Understand the evolutions of human rights concepts
- Gain knowledge on human rights declarations and rights
- Gain knowledge on national and international human rights organizations

UNIT-I: Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights - Historical Development of Human Rights.

UNIT-II: International Human Rights - Prescription and Enforcement upto World War II - Human Rights and the U.N.O. - Universal Declaration of Human Rights - International Covenant on Civil and Political Rights - International Covenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT-III: Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner.

UNIT-IV: Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts.

UNIT-V: Contemporary Issues on Human Rights: Children's Rights - Women's Rights - Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment. Fundamental Rights in the Indian Constitution - Directive Principles of State Policy - Fundamental Duties - National Human Rights Commission.

Books for Reference:

1. International Bill of Human Rights, Amnesty International Publication, 1988.
2. Human Rights, Questions and Answers, UNESCO, 1982
3. Mausice Cranston- What is Human Rights
4. Desai, A.R. - Violation of Democratic Rights in India
5. Pandey - Constitutional Law.
6. Timm. R.W. - Working for Justice and Human Rights.
7. Human Rights, A Selected Bibliography, USIS.
8. J.C.Johari - Human Rights and New World Order.
9. G.S. Bajwa - Human Rights in India.
10. Amnesty International, Human Rights in India.
11. P.C.Sinha & - International Encyclopedia of Peace, Security
12. K. Cheous (Ed) - Social Justice and Human Rights (Vols 1-7).
13. Devasia, V.V. - Human Rights and Victimology.

Practical – 2**CONCURRENT FIELD WORK – II**

Learning Outcome: *The students will...*

- Practice the primary methods of social work in different settings
- Understand the applicability of the methods and techniques of Social Work in the fields of social work
- Enhance their skills of Social Work practice

The first year students during the second semester go for practice based social work for two days in a week and expected to spend a minimum of 15 hours per week in the field where they are placed.

The first year students are placed in villages or hospitals or schools or NGOs or government offices or counseling centers or welfare organizations or service organization for their practice based social work.

During the placement they have to practice all the primary methods of social work. One has to help minimum of 3 clients using casework method, and form one group and practice group work method following all the stages of group work practice with at least 10 sessions and in the community conduct common program or solve an issue of the community following the principles of community organization and social action.

Every week the students write a report of their activities and submit to the concerned field work supervisor. The supervisor conducts individual and group conference regularly.

The CA marks are awarded by the supervisor out of 40 marks for the quality, regularity, initiatives, leadership, participation and team worker.

At the end of the semester Viva Voce is conducted by an external examiner and marks are awarded out of 60.

BLOCK FIELD WORK**Course Completion Requirement (CCR)**

Learning Outcome: *The students will...*

- Gain experience in a social work field by being in an open or closed setting
- Understand the techniques and approaches adopted by the organization
- Apply the knowledge gained, in the field of social work

During the fourth semester the students go for one month (minimum 24 working days) block field placement training preferably in their respective field of specialization. The students are placed in villages or hospitals or schools or NGOs or government offices or counseling centers or welfare organizations or service organization or industries during the course of block field placement.

Students should get daily activity sheets signed by the concerned persons in the organizations. They have to write daily records of their learning and submit to the department once they complete their field placement. Successful completion is certified by the department and communicated to the Controller of Examination.

This is Course Completion Requirement and no marks are attached. However 5 credits are given.

SEMESTER – III**Paper – 9****HUMAN RESOURCE MANAGEMENT**

Learning Outcome: *The students will...*

- Gain knowledge about the management of human resources
- Understand the programmes and activities of management of human resources
- Acquire the skills of working with organized and un organized human resources

UNIT 1: Human Resource Management: Concept, role and importance as part of general management – Personnel Management Vs Human Resource Management - objectives and Functions of HRM - Evolution of HRM – HRM in Service and Manufacturing Organisations: Industry, Hospital, Hotel, Shops and Establishments, Software Industry and Service Organisations.

UNIT 2: Human Resource Planning: Concept and process of Human Resource planning – Recruitment and selection. Sources of manpower supply: On-Campus, Off-Campus, Referrals, Consultancies, Internal Mobility, Employee outsourcing. Selection Process: Application Blank, Written Test, Group Discussion, Essentials of a good Curriculum Vitae, Interviewing techniques and skills, Types of Interviews, Offer Letters, References, Medical Check-ups; Induction and Placement; Job design, job analysis, Job descriptions, Job classification and Job evaluation.

UNIT 3: Employee Retention and Separation: Attrition and Retention - Concept and Problems. Causes of Job Hopping. Leave Management: Types of Leave. Disciplinary procedures: Concept of Charge Sheet, Domestic enquiry. Grievance Redressal Procedures; Performance Management Systems; Transfers and Promotions. Separation: Discharge, Dismissal, Resignation, Retirement, VRS, CRS; Exit Interview; Retirement Benefits.

UNIT 4: Compensation Management: Concept of Wage and Salary – Wage Theories – Types of wages – Wage Board - Wage Components - wage differentials – wage regulators – Incentive Schemes - Fringe Benefits - Employee benefit plans.

UNIT 5: Current Trends in HRM:HRIS, ERP in HRM – e-HR: e-Recruitment, e-Learning, Performance Management, e-Reward - Manager Vs. Leader - Concept of Human Relations Approach -Challenging role of human resource manager. Cases and papers.

Reference

1. Aswathappa K. 2011. Human Resource Management Publishing by Tata Mc Graw Hill Education Pvt. Ltd.
2. Dessler Gary, Biji Varkkey. 2012. Human Resource Management. Dorling Kindersley Publishing Company.
3. Jeffrey A Mello. 2011. Strategic Human Resource Management. Cengage Learning India.
4. Michal J Kavanagh & Mohan Thite. 2010. Human Resource Information System. Sage Publications India Pvt Ltd.
5. Premavathy N. 2011. Human Resource Management and Development. Sri Vishnu Publications. Chennai.
6. Uday kumar haldar. Human resource management. 2010. Published in India by oxford university press.

Paper - 9**RURAL & URBAN COMMUNITY DEVELOPMENT**

Learning Outcome: *The students will...*

- Gain knowledge about rural urban community
- Understand the programmes & activities of rural and urban development
- Acquire the skills of working with rural and urban community

UNIT 1: Community: meaning, types, characteristics. Community development: Definition & philosophy. Evolution of Community Development. Rural Community Development – Principles, approaches. Early experiments of rural development. Extension – meaning, principles, approaches. Participation – meaning, relevance, technique & levels. Dimensions of participation. Participation in rural development.

UNIT 2: Sustainable development: meaning, importance. Millennium development goals. National priorities of the Govt. of India based on MDGs. Human Development Index - Dimensions and importance. Assessment of needs and problems in the community. Participatory Rural Appraisal – characteristics, principles, tools, steps and limitations.

UNIT 3: Urbanization: Concept- Urban, Urbanism - Characteristics- Types of urban centers - Town - Metropolitan city Satellite towns - Megacity - Parallel city. Urban development and Urban community development - meaning - origin of urban community development- Welfare extension policy of central social welfare board as pilot project - Delhi project -Baroda project - Jamshedpur project.

UNIT 4: Urban Social problems: Crime – accidents – Prostitution - Pavement Dwellers – Street Children – Solid Waste Management - Pollution Control. Urban traffic problems- Metro rail and MRTS projects - Road safety systems - Infrastructure development - Urban housing problems – Housing schemes- Urban development Policy- Town planning - Urban Renewal programs in Indian cities. Characteristics of Slums in Indian cities- Slum clearance board- Functions of slum clearance Board- Programs for slum dwellers.

UNIT 5: Role of Government & NGOs in Development: Government programs & schemes – poverty alleviation, women development, SC/ST development, child development. Voluntary action – NGOs in rural urban development. Community based organization, programs & projects. Involvement of NGOs in urban community development - Need for NGOs in urban community development – N.G.Os working at Urban centers.

References

1. Kumar, Somesh. 2004. Participatory Method in Community Work. New Delhi: Himalya Publisher.
2. Maheswari, S.R. 1994. Rural Development in India. Delhi. Sage publishers.
3. Noble G. Allan .1997 India Urbanization New Delhi. Tata McGraw Hill Publishing Company.
4. Rajib Luchanpanigrahy. 2006. NGO for Rural Development. Mohit Publications. New Delhi.
5. Rasure K A. 2010. Rural Credit in the Era of Globalization. Madhav Books Publications. Hariyana.
6. Singh Kattar. 2009. Rural development. Sage publications. New Delhi.
7. Singh, Prabhakar. 1994. C.D. Programmes in India. Delhi. Deep and Deep.
8. William, A. Thomas and A. J. Christopher. 2011. Rural Development – concept and recent approaches. Jaipur. Rawat Publications.

Paper – 9**MENTAL HEALTH AND PSYCHIATRIC SOCIAL WORK****Learning Outcome: The students will....**

- To understand the concepts and historical development of the field of Psychiatry
- To gain knowledge on the various psychiatric disorders and the role of social worker
- To Gain knowledge on Emerging researches in mental health

Unit I: Introduction

Concept of Normality & Abnormality; Concept of Mental Health, Psychiatric Social Work, Community mental health and Community Psychiatry. Historical development of psychiatry as a field of specialization, Attitudes and beliefs pertaining to mental illness (Ancient, Medieval and modern times), Positive mental health as social capital; Scope and trends of Psychiatric Social work in India & Abroad. Mental health problems in India. Misconceptions about mental illnesses.

Unit II: Classification & Assessment of Mental Health Disorders

Diagnostic statistical Manual-DSM-V, International classification of diseases-ICD-10, Psychiatric Assessment: Interviewing, Case history taking, Sources of intake, Mental status examination, Formulation of psychosocial diagnosis, Use of computers in assessment.

Unit-III: Psychiatric Illness & Disorders.

Classification of Mental Disorders: Organic, Toxic (Drug Abuse), Functional (Non- Organic) Organic Mental Disorders: Symptoms and Causes of Dementia, Delirium, other mental disorders due to brain damage and dysfunction and to physical disease. Toxic: Symptoms of Mental and Behavioural disorders due to Psychoactive Substance Use. Functional (Non Organic) Mental Disorders: Signs, Symptoms, Etiology, Management and types of Schizophrenia, Delusional Disorders, Mood (affective) Disorder, Neurotic stress related and Somatoform disorders and Personality Disorders

Unit-IV: Behavioural Disorders and Child hood Disorders

Behaviour disorders: Eating Disorders: Anorexia Nervosa, Bulimia Nervosa, Non Organic Sleep Disorders Common Mental Health Problems and Disorders in Children: Mental Retardation, Disorders of Psychological Development: Speech Disorder, Developmental disorders and Autism. Behavioural and Emotional disorders. Role of Psychiatric Social Workers. Limitations and difficulties faced in psychiatric social work practice.

Unit V: Research in Mental Health

Emerging research in mental health. WHO Evidence based researches in Mental Health. Difficulties in practice informed research & research informed practice. Analysis of Existing Policies related to Mental Health.

Reference:

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Paper - 10**LABOUR LEGISLATIONS AND LABOUR WELFARE**

Learning Outcome: *The students will...*

- Gain knowledge about labour legislations and labour welfare
- Understand the legal provisions of labour welfare
- Acquire the skills of working with corporate sector

UNIT 1:. Introduction: Industrialization –Concept and Impact of Industrialization in India. Labour: Concept, Characteristics and Problems of Indian Labour. Organized and unorganized Labour. Labour Welfare: Concept, need, objectives, principles and theories. Administration of labour- Central and State level . Labour welfare officer: Qualification, Need, roles and functions. Objectives and Functions of ILO.

UNIT 2: Labour Legislations: Concept and History of labour Legislations in India. Legislations for labour welfare in different types of industries: The Factories Act of 1948, The Mines Act, 1952 , The Motor Transport Workmen Act, 1961 Plantation Labour Act, 1951, The Dock Workers (Safety Health and Welfare) Act 1986, Tamilnadu Shops and Establishment Act 1947- Sexual Harassment of women at workplace (Prevention Prohibitions & Redressal) Act 2013.

UNIT 3: Industrial Relations Legislation: Indian Trade Union Act 1926, Industrial Disputes Act 1947, Employment Legislations: Industrial Employment (Standing Orders) Act 1946, Contract Labour (Regulations and Abolition) Act 1970. Tamil Nadu Industrial Establishment (National Festival and Holidays Act 1958).

UNIT 4: Wage Legislations: Payment of wages Act, 1936, Minimum wages Act, 1948., Payment of Bonus Act, 1965, Equal Remuneration Act 1976.

UNIT 5: Social Security Legislations : Employees State Insurance Act 1948, Employees Provident Fund Act 1952, Payment of Gratuity Act 1972, Maternity benefit Act 1961, Workmens Compensation Act 1923. TN Labour Welfare Fund Act 1972, (Relevant Case Studies to be discussed in the class).

Reference

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Paper – 10**RURAL AND URBAN GOVERNANCE (Main Core-9)****Learning Outcome:** *The students will...*

- Gain knowledge about rural and urban governance.
- Understand the functions and activities of local self-governments.
- Acquire the skills of working with and through local self-governments.

UNIT 1: Governance - Meaning and Structures. Democratic Decentralization - Meaning, objectives and importance – Concept & Evolution of Panchayati Raj - Historical development of the concept, National level committees in the evolution of Panchayati Raj (Balwantrai Mehta, Ashok Mehta, Singhvi committees).

UNIT 2: Evolution of Panchayat Raj Institution till 73rd Constitutional amendment - Evolution of Urban Local Government till 74th Constitutional amendment. - The Constitutional 73rd & 74th Amendment -Background of and obstacles to its passage - Community participation in governance - Changing features of Local Government

UNIT 3: The Functions of Panchayati Raj Institutions – District Panchayat, Block Panchayat, Village Panchayat. Structure, Functions and Finances. Relationship between officials and non-officials. Committees in village level Panchayati Raj bodies, Gram Sabha, Mahila Gram Sabha, its role and importance - PESA (Panchayat Extension in Scheduled Areas) - Context of its emergence and its significance - issues and challenges in its implementation for tribal self-rule.

UNIT 4: Urban Governance - History of Urban Local Self Government in India - Types of Urban Local Self Government in India - Municipal Corporation, Municipal Council/Nagar Palika - Sources of Revenue - Structure, powers and functions at each level - Committees and their functions - System of elections to Urban Local Self Government - Ward Committees and citizen participation - Relation of Urban Local Self Government with bodies of Governance at the state level issues

UNIT 5: Contemporary issue and problems in Local Self Government – Women's participation; participation of marginalized groups (SC & ST & minorities) - Domination of Upper Caste; political parties; autonomy and control; factionalism in governance - Challenges in developing partnerships between elected bodies, bureaucracy and civil society - Role of PRIs in rural, urban & tribal development - E Governance.

Reference:

1. Agarwal Babitha. 2009. Urbanization of Rural Areas. Rajdhani. New Delhi.
2. Arora K. Ramesh. 2009. Panchayati Raj Participation and Decentralisation. Rawat publications. Jaipur.
3. Bidyut Mohanty. 1993. Urbanization in Developing Countries, Concept Publishing Company. New Delhi.
4. Bondyyo Padhyay. D. 2003. Empowering Panchayats Handbook for Master Trainers Using Participatory Approach. Concept Publications. New Delhi.
5. Hariprasad Chhetri, 2008, panchayati raj system and development planning, Rawat publications , NEW DELHI
6. Jacob. Z. 2008. Urban Community Development. Rawat publications. Jaipur.
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Paper - 10

MEDICAL SOCIAL WORK**Learning Outcome: The students will....**

- understand the historical developments of Social Work in Medical Settings, existing status and its development.
- Gain knowledge on the Holistic and Integrated approach to Social Work Practice in the field of Health.
- Understand the common Physical Diseases and Health problems of the Community.
- gain the capacity to perceive the relation of Environment and Socio Cultural and Psychological factors in the causation, treatment and prevention of diseases.

Unit – I: Concepts and Definition: Health, Hygiene, diseases, Illness and Handicap. Medical Social Work: Meaning, Definition, objectives and Scope. Historical Development of Medical Social Work in India and Abroad. Organization and administration of medical social work departments in hospitals in the State and Central Government organizations.

Unit – II: Health Care Models: Preventive, Curative, Promotional Model. Integrative Model and Development Model. Holistic Approach to Health, Alternative System of Health – AYUSH (Ayurveda, Unani, Siddha, Yoga, meditation, Naturopathy). Health Education: Concept and Principle, Models, Methods and Techniques. Health Empowerment & Social marketing.

Unit – III: Role of Social Worker: Patient as a person: Concept of patient as a person, Patient as a whole, Social Assessment of patient's family, Understanding the problem of patient, Illness, behavior and treatment behavior of the patient, Impact of illness on the patient and family. Palliative care and Pain Management, Patient's Rights and Medical Ethics in health care. Concept of long-term hospitalization, Impact of long-term hospitalization on the patients and the families. Teamwork and Multidisciplinary approach in health care.

Role and Functions of Medical Social Worker: Counselling and Rehabilitation – patients and their families of Organ Transplantation, Spinal Cord Injuries, Epilepsy, and Medico-legal Cases. Promoting health needs and functions of Rural and Urban Community Settings.

Unit – IV: Diseases: Major communicable diseases: TB, STD, HIV/AIDS, UTI, Polio, Diarrheal Diseases, Vector Borne Disease, Typhoid, Leprosy, Leptospirosis, Respiratory Tract Infection (RTI). Major non communicable diseases: Cancer, Diabetes, Hypertension, Cardiac Disorders, Neurological Disorders, Asthma.

Psychosocial Problems and the role of medical social worker in dealing patients: Physically Challenged, Nutritional Disorders, Occupational Health

problems, Women's Health problems, Pediatric Health problems and Geriatric Health problems

Unit - V : Medical Social Work practice in different settings: Hospitals, Out-Patient departments, Emergency / Crisis Care, ART Centers. Hospice, Special Clinics and Community Health use of Volunteers, Social Support and Self Help groups. Role of Medical Social Worker in Hospital settings. Problems encountered by Medical Social Workers in the field.

References:

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14. Sarah Ghelert, 2006 Hand book of Health Social Work, John Wiley & Co., London

Skill Paper**LIFE SKILLS**

Objectives: *The students will...*

- Gain knowledge about life skills
- Understand the application of life skills in social work practice
- Acquire the skills of applying the life skills in the field of social work

UNIT 1: Basics of Life Skills – Definition – Social Skills - Self Awareness through SWOT Analysis, Johari Window – Empathising with Others - Effective Communication and Interpersonal Relationship - Assertive skills - Handling negative peer pressure - Managing diversity in cross cultural settings - Etiquettes and Manners.

UNIT 2: Thinking Skills: Critical Thinking – Rational and Unbiased view. Creative thinking- Being flexible & Exploring options. Decision Making & Problem Solving – Model for Decision making - Negotiation skills - Responsible sexual behavior - Handling stigma & discrimination.

UNIT 3: Emotional Skills - Coping with emotions- Emotional Intelligence & Empathy - Handling Negative Criticism, Hurt feelings and Anger. Coping with Stress, Burn outs and stages of burn outs - Promoting wellness through Pranayama, Yoga, Meditation Exercises and Recreation - Developing Spirituality and Life Purpose.

UNIT 4: Employability Attributes & Skills – Initiative, Self-presentation, Personal responsibility, Self – Management, Sustaining motivation in work, Ability to deal with pressure, Work-Life Balance, Team Work, Integrity.

UNIT 5: Entrepreneurial Attitude and Skills – Innovativeness, Risk taking ability, Having the Need to Achieve, Identification of business opportunities, Being Resourceful Perseverance Confidence, Hard work and the efforts need to be put in the business.

Reference

1. Clements Phil. 1998. Be positive. Kogam Page India Pvt. Ltd. New Delhi.
2. Gupta Seema. 2001. Etiquette and Manners. Pustak Mahal. Delhi.
3. Iyengar, BKS. 2005. The Art of Yoga. Harper Collins. New Delhi.
4. Lindenfield Gael. 1997. Assert Your-self. Harper Collins Publishers India Pvt. Ltd. New Delhi.
5. Maheswari G.D.2000. Complete Guide to Career Planning. S. Chand & Company Ltd. New Delhi.
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Elective Paper – 2**COMPUTER APPLICATION IN SOCIAL WORK****Learning Outcome: The students will...**

- Understand the fundamentals of computing and word processing.
- Gain knowledge and familiarity in using SPSS in social work researches

UNIT-I: Fundamentals of a Computer: Meaning, Characteristics, basic operations –input, storage, processing, output, ALU and control. Devices of a computer hardware, software, types of software –application, system, utility. Meaning of programme. Computer language –machine, assembly high level. Assembler, interpreter and compiler, operating system. Dos, Windows.

UNIT-II: Word Processing: Meaning, Features, advantages. Structure of a word window. Creating, saving opening and printing documents. Creating tables. Mail merge-main document, data source and merging. Spread Sheet Package: Cell, rows and columns. Range, structure of excel window. Creating, saving opening and printing a spreadsheet, creating tables, charts, calculations. Presentation package: Creating presentations in power point, tables, charts. Animation running slide show, saving the slides, printing presentations. Internet and browsing E-Mail, use of Internet in Research. Practical - creating document, excel, power point and mail merge.

UNIT-III: Statistical Package for Social Science: Basics of Statistical analysis–population, sample, case, case number, variable, variable level, types of variable –numeric, string, alphanumeric, system missing value, user defined missing value, code book and code sheet, types of statistics, Statistical tests, types of analysis. Structure of SPSS windows.

UNIT-IV: Creating data file, syntax file and output file: Defining data, Variable name, Variable label Values, value labels. Editing data file, adding cases, adding variables, saving files, retrieving data files, printing data file. Recoding of data.

Practical –creating data file, syntax file, output file. Fixing output file in word.

UNIT-V: Analysis of data: Single frequency, bivariate analysis, charts and diagrams. Editing of table and charts, exporting tables and charts in word document. Interpretation of data, Application of statistical calculation and test, measurement of central tendency, dispersion, Chi-Square test, 't' test. Application of correlation, regression. ANOVA, factor analysis.

Practical –creating frequency table, cross tables, charts and statistical tests –chi square test.

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Elective Paper – 2**HOTEL FRONT OFFICE MANAGEMENT****Learning Outcome. The students will...**

- Gain employability skill and knowledge of students.
- Access to Virtual course so that those who are already pursuing another regular course can get a Certificate through online.
- Gaining scope for getting employment in the field of Tourism and Hotel Industry.

Unit – I: Introduction to Hotel Industry – Concept of Hotel – Types of Hotels – Types of Rooms and Tariff – Restaurant: Food and Beverage Management -Tourism – Importance of Hospitality in Tourism – Tourism in India- Role of Travel Agents in Tourism Industry.

Unit – II: Front office Operations – Concept – Functions – Importance of Front office Department in Guest satisfaction – Qualities and Attributes of Front office Personnel – FOM Organizational Structure – Guest Cycle (Pre-arrival, arrival, Occupancy and Departure) – Job Description (Front office Manager, Reservation Supervisor, Front Office Cashier, Front Office Assistants, Reservation Assistants and Bell Boys). Lobby – Reservation Management (Online, Telephonic and Agent bookings)

Unit III: Information (Information Desk, Information Rack, Key Management) – Reception - Front office procedures for Emergencies (Fire Fighting, Prevention of employee and guest theft and First Aid)- Night Auditing – Equipments in Front Office (PBX, PABX, EPABX)

Unit – IV: Front office Cashier – Functions – Records and Ledgers - Hotel Credit – Foreign Currency Encashment– Safety Locker Management – Establishing Room Rates (Rule of Thumb, Hubbard's Formula) – Room Revenue Analysis.

Unit –V: Skills for Front Office Management – Personal Hygiene and Grooming – Computing Skills – Telephone Etiquette – Email Etiquette – Problem Solving Skills - Trends in Front Office Management.

Reference:

1. Alan Fyall & Brian Garrod, 2010, Aspects Of Tourism Marketing, Viva Books Pvt.Limited, New Delhi
2. Chistopher Lovelock & Jochen Writz & Jayanta Chatterjee, 2011, Services Marketing, Dorling Kindersley Pvt.Limited, South Asia
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5. George D. Pamplone- Roger, 2010, Healthy Body, Editorial Safeliz, Spain
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Elective Paper – 2

DISABILITY AND SOCIAL WORK**Learning Outcome: The Students will**

- gain knowledge regarding classification, characteristics, causes, approaches for disability.
- get familiarize the student about the strategies, therapies and assistive devices for helping the disabled.
- know the need for education, types and models for the disability.
- To acquaint the avenues of employment both in the organized and unorganized sector.
- To familiarize with the various Laws, welfare, and rehabilitation services to the disabled.

Unit I : Introduction to Disability: Definitions-, Disability, Impairment, Handicap, Magnitude, Causes and Consequences of Disability. Disability as a social construct: Attitudes, Stigma, Discrimination faced by people with disability. Myth and misconception of Disability. Disabling and Enabling Environment for person with Disability. Different approaches to disability.

Unit II: Classification of Disability: Different Types of disability -Visual Impairment, Hearing Impairment, Locomotor Disability, Intellectual disability/mental retardation -Cerebral Palsy, Multiple Sclerosis, Autism - magnitude, causes, types, assessment, impact on child's development and adult. Psycho social problems of persons with disability: magnitude, causes, types, assessment, impact on child's development and adults.

Unit III: Needs and problems of Persons with Disability: Health problem including physical, mental, reproductive and sexuality . Psychology of disability, adjusting to one's own disability, self esteem, resilience and coping mechanism of individual. PWD in Rehabilitation context. Role of Social Worker in rehabilitation of Person with Disability and as a vital member of Multidisciplinary rehabilitation team. Level of rehabilitation- Prevention, promotion and tertiary.

Unit IV: Education and Employment for Disabled: Special education and integrated Education : Definition, need and importance. Difference between integrated and inclusive education. Work disability management. Scheme of integrated education for the disabled children (IEDC), National policy on education 1986, Project integrated education for the disabled (PIED). Accessibility /Barrier free environment, Assistive devices for the disabled: Wheelchairs, walker, PERS or Tele care, Braille, screen readers, screen magnifiers, optical character recognition (OCR) software, speech generating devices, Neuro page, Wakamaru, prosthesis, prosthetic, or prosthetic limb.

Unit-V : Rights and Entitlements Of The Disabled – Laws & Institutes: Introduction to disability & law, Fundamental rights and constitutional rights

of the disabled, Mental health act 1987, The rehabilitation council of India Act(RCT) 1992, The persons with disability Act 1995 (PWD), The national trust act (1999), Artificial limbs manufacturing corporation of India ALIMCO). National Institutes: District Rehabilitation centre, District disability rehabilitation centres, Composite regional centre (CRCs), Regional rehabilitation centre (RRCs)

References:

1. Singh J.P Dr. and Manoj K. Dash Dr. disability development in India .RCI,
2. Kanishka, Pub, New Delhi, 2005
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6. NIHM and Indian institute of public administration, 2004
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Practical - 2**CONCURRENT FIELD WORK – III**

Learning Outcome: *The students will...*

- Gain experience by applying the theoretical knowledge in the field
- Understand the functions and activities of field placement organization
- Acquire of the skills of applying the class learning into practice

During the third semester field work, the students are placed in agencies according to their specializations and they undergo the field training under the close supervision of the agency personnel.

The students get a hand on experience of the day –to- day functioning of the agency. They assist the agency in their routine functions of the organization and participate in all the professional activities. It provides them an opportunity to link theory with practice.

The students undertake any assignments given to them by the agency; they may also undertake any research for the organization.

The CA marks are awarded by the supervisor out of 40 marks for the quality, regularity, initiatives, leadership, participation and team work.

At the end of the semester Viva Voce is conducted by an external examiner and marks are awarded out of 60.

SEMESTER – IV**Paper – 11****ORGANISATIONAL BEHAVIOUR**

Learning Outcome: *The students will...*

- Gain knowledge about organizational behaviour.
- Understand the functions and activities of organizational behavior.
- Acquire the skills of working with organized sectors and human resources.

UNIT 1 : Organizational behaviour: Brief History, Definition, Contributions of the Behavioral Sciences -Human Behavior at Work - Theories of Motivation – Motivating Humans – Systems Theory, EQ at Work - Stress and anxiety management, Frustration, Conflict. Job Satisfaction, Job Rotation, Job Clarification, Employee Morale, Job Monotony and Role Conflict.

UNIT 2: Team-work and Team building, Change Management, Leadership: Theories, Styles and power structure, Decision-Making - Employee Participation and Organizational Commitment.

UNIT 3: Organizational Development: Concept, Definition, theories and practice: OD and OB, OD Intervention techniques: Sensitivity Training, Quality Circles, Survey Feedback, Management of change. Concept of Organisational Culture and Organisational Climate.

UNIT 4: Current Trends in OB Practices: Just-in-time (JIT), 5S Model, HR Connect, Six Sigma and Lean Six Sigma, Total Productivity Management (TPM), Total Quality Management (TQM), Small Group Activities (SGA), Kaizen Groups, International Standard Organization (ISO), SEI, IED, Suggestion Scheme and QWL. Work-life Balance.

UNIT 5: Relevance of OB in Social Work - Challenges involved in application and practice of OB. Behavioral changes in individuals and teams. – Case study presentations.

References

1. Aswathappa K., Organizational Behaviour, Himalaya Publishing House, Mumbai.
2. Avinash K Chitale And Rajendra Prasad Mohanty And Nishith Rajaram Dubey, 2013, Organizational Behaviour, Phi Learning Pvt Ltd, New Delhi.
3. Dipak Kumar Bhattacharyya, 2013, Organizational Behaviour, Oxford University Press, New Delhi.
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Paper – 11

DEVELOPMENT STRATEGIES

Learning Outcome: *The students will...*

- Gain knowledge about development strategies
- Understand the functions and activities of different developmental strategies
- Acquire the skills of using the developmental strategies in different sectors

UNIT 1: Self Help Groups meaning- Characteristics- formation- animation. Federation of SHGS at the Panchayats, Cluster, Block and District. Role of state in SHGs. Role of banks in SHGs. Maintenance of records in SHGs. Grading and evaluation of SHGs. Role of SHGs in local issue tackling. Leadership in SHGs. Problems faced by SHGs. SHGs and Economic development. Role of NGOs in SHGs. Role of social workers in SHGs. Micro finance- meaning and characteristics- working of Micro finance- Philosophy of micro finance- Role of Social worker in Micro finance.

UNIT 2: Water shed Management – meaning, philosophy, objectives, and implementation. Economic benefits, social benefits. People's participation in water shed management, by products of water shed management. Role of NGOs in water shed management. Role of government in water shed management. Changes in life style due to water shed management. Limitations of water shed management. Role of social workers in water shed management.

UNIT 3: Waste land development – meaning and characteristics. Identification of waste land, assessment of waste land, process of waste land development. Role of NGOs in waste land development. Role of government in waste land development. People's participation in waste land development. National economic development and waste land development. Limitations of waste land development. Role of social worker in waste land development projects.

UNIT 4: Entrepreneurship – meaning, characteristics. Problems of entrepreneurship. Women entrepreneurs, rural entrepreneur. Personality and dynamics of entrepreneurs. Training and development of entrepreneurs. Role of SIDCO, TADCO, NABARD, SSIS.SIPCT, and KVIC in entrepreneur development. Role of social workers in entrepreneur development.

UNIT 5: Environment, Ecology, Ecosystem – meaning. Environmental components – physical or natural, human, social, biotic. Environmental problems – green house effect, global warming, ozone destruction, acid rain, radiation, soil erosion. Causes of environmental problems – industrial revolution, population growth, technological development. Constitutional provisions – Article 48A, 51.

Reference

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Paper - 12**CLINICAL SOCIAL WORK****Learning Outcome: The students will.....**

- understand of the concepts related to working in clinical set up and processes involved in it.
- understand the use and practice in clinical setting among various fields of social work.
- Gain knowledge about the role of social worker in mental health centers and hospitals.
- Become familiarized with the emerging trends and experiments in mental health interventions
- understand the uniqueness of social workers role in clinical settings.

Unit I: Clinical social work: Meaning & Definition, Goal & Objectives, Scope Historical development, values & concepts underlying clinical social work practice. NASW Standards & behaviours for the practice of clinical social work. Health care policy and health care insurances. Core Competencies, techniques and Careers in Clinical Social Work practice.

Unit II Differential Diagnosis, Assessment and techniques: Diagnosis and Assessment: Concept & Definition, assessment, role of one assessing, the involvement of one assessed, expertise skills and goals of assessment. Assessment in complete treatment process. Types of assessment: Case study – biopsychosocial, genogram, ecomap, risk factors, suicide/homicide, psych testing, drug/alcohol, spirituality/religion, strength and capability, mini mental status examination. Differential Diagnosis.

Unit III Approaches, Theories and Models: Comprehensive assessment (biopsychosocial-spiritual model). Integral primary care, Four Quadrant model. Chronic care model (Wagner). Self determination theory (Ryan & Deci). Motivational Interviewing. 5A's model. Patient self management. Patient activation. IMPACT model. SBIRT model. Trans-theoretical model. Continuum of collaboration. Shared care. Common factors model (Duncan, Miller & Hubble Wampold). Multidisciplinary communication. Strength based assessment. Solution focus & brief therapy. Integrative medicine. Complementary and alternative therapies. Health care management (Lorig). Stress Vulnerability model.

Unit IV Clinical social work in various settings: Clinical Social Work & Direct Social Services. Practice of clinical social work in different setting: Family service agencies, child welfare agencies, school settings, correctional institutions, general hospital settings & de-addiction centers, industrial settings, nontraditional mental health services, national & international charitable organization. Working with multi-disciplinary team, industrial health services, law and ethics relating to clinical social work, clinical social worker as case manager evidence based social worker.

Unit V Promotion, Prevention, Treatment and Rehabilitation: Definition: Promotion, Prevention, Treatment & Rehabilitation. Engage in research

informed practice & practice informed research, barriers to treatment. Stages of change. Spontaneous/Natural recovery. Court mandated treatment. Self awareness, self care and critical reflections

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Paper - 12**INDUSTRIAL RELATIONS**

Learning Outcome: *The students will...*

- Gain knowledge about trade unions
- Understand the functions and activities of trade unions
- Acquire the skill of working with the workers and unions

UNIT 1: Industrial Relations: Concept, Characteristics and Approaches .State and Industrial Relations – Code of Conduct and Code of Discipline in Industry

UNIT 2: Collective Bargaining: Concept – Theories – Goals – Principles – Prerequisites – Stages of Collective Bargaining – Bargaining Strategies – The factors influencing Collective bargaining – Skills of an effective bargaining agent. Inter and Intra union rivalry, Concept of Conciliation, Arbitration and Adjudication.

UNIT 3: Workers Participation in Management: Concept – Aims and objectives – Scope – Levels of Participation – Conditions essential for working of the Scheme of workers' participation in Management

UNIT 4: Trade Unions and Employers Organization: Origin and Growth of trade union movement in India – Theories – Functions – Administration of Unions – Leadership – Membership and Finance – Close shop, Open Shop and Check off system – Employers' organization: Objectives and functions of various employers organization, membership and finance. Issues and Challenges of Trade unions in India. Emerging Trends in Union – management relations: Impact of Globalization and Liberalization. New Paradigms of Industrial Relations in India.

UNIT 5: International Labour Organization: History – Mission and Objectives – Structure: International Labour Office , General Body and International Labour Conference –Functions of ILO . Concept of Tripartism in ILO in India: India-Decent Work Country Program (2013-17) ,

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10. Michael Armstrong ,2011, Strategic Human Resource Management (4th Ed), Kogan Page India Pvt Ltd, New Delhi

Paper - 12

LIVELIHOOD AND SOCIAL AUDIT

Learning Outcome: *The students will...*

- Understand the concept, need, importance and principles of rural livelihood and social audit.
- Gain knowledge on rural livelihood and the various methods involved in social auditing
- Acquire skills to practice social accounts and audit.

Unit: 1 Sustainable Livelihood: Context of Poverty eradication - (Concept - Poor, Multidimensional aspect of Poverty, Tools of Poverty Assessment, historical development of poverty eradication and alleviation programs) Livelihood – Concept, Sustainable livelihood – principles, approaches (UNDP, DFID, CARE, OXFAM) and frameworks. Livelihood mapping: Tools and techniques for livelihood mapping and sub sector analysis- Participatory Assessment and Planning for SL (PAPSL), Rapid and Participatory Livelihood Security Assessment (RLSA).

Unit: 2 Institutionalized Livelihoods: Livelihood promotions: By different agencies (Government and Non-governmental organizations - Local and International Organizations) – Major livelihood programs in India (National Rural Livelihood Mission (NRLM), Pudhu Vazvu Thittam, Mahalir Thittam) – Challenges in livelihood promotions; Livelihood strategies: Livelihood portfolio for rural poor, Agriculture, Migration, Diversification, Sectoral approach.

Unit: 3 Social Accounts: Social Accountability-Concept; Social accounting- Concept – History, Scope, objectives and importance. Principles of social accounting – Models of social accounting – Approaches – Steps involved in Social accounting - Benefits and challenges of social accounting, Distinction between financial accounting and social accounting.

Unit: 4 Community Social Audits: Social Audit: Concept, Scope, Objectives. Principles of social audit: Transparency, Participation, Representative Participation and Accountability. Types of social audit. Stages in social audit: Preparatory stage, Implementation stage and Follow up – Benefits and challenges of social audit – Social Audit vs Financial Audit – Community Audit: Role of gram panchayat and gram sabha in social audit

Unit: 5 Skills for Social Worker: Use of existing Livelihood frame works in the community, Practical use of tools and techniques for social Accounting and auditing - Social Impact Assessment (SIA), Social Accounting and Auditing (SAA) and Community Auditing and Reporting, Writing the books of accounts and auditing. Documentation and Reporting.

References:

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2. Aret, Diana and et.al. 2009. Participatory social auditing: a practical guide to developing a gender-sensitive approach. Institute of development studies. Brighton.
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Paper – 12**THERAPEUTIC INTERVENTIONS IN SOCIAL WORK****Learning Outcome:**

- understand the various forms of Therapeutic Interventions in Social work practice.
- Understand the skills in practicing various psychosocial interventions while working with patients, their families and communities.
- get into integrating indigenous and holistic therapeutic practices in keeping with the principles and the code of ethics of Professional Intervention.

Unit I Introduction and Overview: Counselling: counseling process, Values & Ethics in Counselling. Therapy: Meaning & Definition, Types - Medical Therapy, Psycho Therapy, Behavioral Therapy, Skills, Importance and Scope. Difference between theory, therapy and intervention. History of psycho therapy, Phases of therapy: Early phase-rapport, the therapist as a teacher, therapeutic contract phases of contract, limit setting. Middle phase: the relationship as a change agent, emotional work, plunging into progress- agreement and disagreement, silence, the impasse and timing. Final phase: planning for termination, the work of the final phase, feelings reactions to termination.

Unit II Psycho- Social Therapies: Therapeutic Counseling & Psychotherapy: Meaning, Definition and Techniques, goals of the Therapeutic Process, Therapeutic Techniques & Procedures Psycho-Social Therapies: Definition, Types, Emerging Trends in Holistic treatment. Cognitive and behavioural therapies : Acceptance and commitment therapy (ACT), Behavioural therapy, Cognitive analytic therapy (CAT), Cognitive behavioural therapy (CBT) and Cognitive therapy. Psychoanalytical and psychodynamic therapies: Jungian therapy, Psychoanalysis, Psychoanalytic therapy, Psychodynamic therapy.

Unit III: Humanistic therapies: Existential therapy, Gestalt therapy, Human Givens psychotherapy, Person-centred therapy (also known as "client-centred" counselling), Psycho synthesis, Solution-focused brief therapy, Transactional analysis and transpersonal psychology. Arts therapies : Art therapy/Art psychotherapy, Drama therapy, Music therapy. Other therapies : Couple Therapy, RET & REBT, Behaviour Modification, Psychodrama, and Crisis intervention, Eye movement desensitization and reprocessing (EMDR), Family/Systemic therapy, Group therapy, Integrative, Interpersonal therapy, Mindfulness, Play therapy and Psychosexual therapy. Role of Social Worker.

UNIT IV Indigenous and Current Techniques: Yoga, Meditation, Spiritual Healing and Relaxation Therapy. Emerging trends in Healing- Transactional Analysis, Neurolinguistic Programming, Positive Imaging, Self analysis and Healing, Pain Management techniques, Trauma

counseling PTSD Therapy- Use of Art Based Therapies in the healing Process.

UNIT V Rehabilitation: Definition, principles, need and importance. Options in rehabilitation- Hospital based- quarter way home, vocational and occupational rehabilitation half way homes, therapeutic communities, day care centers, work place rehabilitation etc. Community based rehabilitation: Meaning and Definition, Objectives, Approaches, components, importance and Scope in Mental Health. Social Worker's role in Therapy, Application of Social Case Work, Social Group Work in therapeutic setting- Emerging trends. Use of Advanced Counseling Techniques in clinical settings.

Reference:

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Elective Paper - 3
DISASTER MANAGEMENT

Learning Outcome: *The students will...*

- Understand the dynamic factors of disasters and their impact at an individual and societal level.
- Deal with disaster preparedness, crisis management, risk reduction and rehabilitation and understand how they are connected.
- Identify the role of different agencies in Disaster Management.

Unit – I: Understanding Disasters: Disaster: Meaning, Concept – Type of Disasters – Effects/ Impacts of Disasters – Disaster Vulnerability of India: Lessons from Bhopal Gas Tragedy, Gujarat Earth Quake, Orissa Super Cyclone, Tsunami and Chennai-Cuddalore Floods.

Unit – II: Disaster Management Cycle – Preparedness, Rescue/Recovery, Relief, Rehabilitation and Reconstruction. Factors influencing disaster preparedness and response. Disaster Management – Policy and Strategies Disaster Management Policy (2005).

Unit –III: Disaster Management Act (2005) – Community Based Disaster Management (CBDM)– Restoration of Livelihood – Disaster Insurance – Insurance as an agency for disaster mitigation - Income Generation Activities and Housing - Task Force Groups – Advocacy.

Unit – IV: Methods & Techniques - Vulnerability Analysis - Survival skills - Creating Awareness through IEC and Media – Training for Youth (CPR, Fire Fighting and Mock Drill) - Relief Camp Organisation - Recovery after disasters.

Unit – V: Role of Social Workers in Psycho-social Support. Role of Agencies in Disaster Management: Role of Government in Disaster Management – National Disaster Management Authority (NDMA) – Role of International Organisations and Civil Society Organisations

Reference:

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2. Form William H and Sigmund Nosow (1958), Community in Disaster, Harper and brothers Publishers, New York
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4. Klinenberg Eric (2002), Heat Wave: A Social Autopsy of Disaster in Chicago, University of Chicago Press, Chicago.
5. Mamata Swain, Jaganath Lenka, Minati Mallick, 2007, Gender Perspective in Disaster Management, Serials Publications, New Delhi
6. Parida P.K. (2002), Towards Rebuilding a Post Disaster Society: A Case Study of Super Cyclone Affected Coastal Orissa , The Indian Journal of Social Work, Vol 63, Issue 2.
7. Quarantelli, et. al., (1998), What is a Disaster, Routledge, London and New York.
8. Sen Amartya (1981), Poverty and Famines, Oxford University Press, New Delhi.
9. Sharma Dhirendra (1983), India s Nuclear Estate, Lancers, New Delhi.
10. Sinha P C, 1998, Encyclopaedia of Disaster Management (Vol 01 to 10).

Elective Paper – 3**CORPORATE SOCIAL RESPONSIBILITY**

Learning Outcome: *The students will...*

- Gain knowledge about corporate social responsibility
- Understand the functions and activities of social audit & entrepreneurship
- Acquire the skills of promoting and working with social entrepreneurship

UNIT 1: Corporate Social Responsibility – Concept, and significance – Evolution of CSR – The Triple Bottom Line Approach - CSR Issues: Environmental, Social, Labor related, Ethical and Governance.

UNIT 2: Organizational environment - Meaning - Types - Organizational Life Cycle - Impact of technology - impact of cultural values on managerial effectiveness - Social responsibilities of business.

UNIT 3: Role of 'Standards and Codes' in CSR: ISO – 14001 (Environmental Management System), Occupational Health and Safety Management Systems (OHSAS) – 18001, Global Compact-UN, Stakeholder Engagement Standard -AA – 1000 (Stakeholder Engagement Standard).

UNIT 4: NGO and CSR – Indian Companies Act 2013 from CSR perspective- Program for the neighborhood: Health, Education, Employment, Social Entrepreneurship and Environment. Communication: Annual Reports and Sustainability Reports.

UNIT 5: CSR- Success Stories in Indian Context – Infosys, TISS, TISCO, USHA. ASSOCHAM Reports in CSR. CSR Awards.

Reference

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2. Garg K.C. And V.K. Sareen And Mukesh Sharma And R.C.Chawla, 2008, Legal Environment Of Business, Kalyani Publications, Chennai.
3. Jeffrey A Mello, 2011, Strategic Management Of Human Resource(Third), Cengage Learning Ind Pvt Ltd, New Delhi.
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5. John R Baotright, 2003, Ethics And Conduct Of Business(Fourth), Dorling Kindersley Ind Pvt Ltd, New Delhi.
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10. Sharma R.K. And Puneet Goel And Pooja Bhagwan, 2009, Business Ethics And Corporate Governance, Kalyani Publications, Chennai.

Elective Paper - 3

HOSPITAL ADMINISTRATION

Learning Outcome: *The students will...*

- Gain basic knowledge on Hospital Administration
- Understand the functions of Hospital
- Acquire the skill of administering Hospitals.

UNIT-I: Overview of Health Care Sector in India – Primary care – Secondary care – Tertiary care – General & special Hospitals - Understanding the Hospital Management: Routine Admission/Discharge Procedures/Discharge Summary - Hospital Utilisation Statistics: Average Length of Stay (ALS), Bed Occupancy Rate and Turn Over Interval – Role of Medical, Nursing Staff, Paramedical and Supporting Staff.

UNIT-II: Functional Hospital Organization: Hospital code of ethics, medical ethics, standards for hospitals, -Hospital functions -Front Office: Duties & Responsibilities - Health Records: Daily Reports / Returns: Hospital Census, Matron's Report, Medical Officer's Report, Casualty Report, Medico-Legal Cases, Report from ICU / ICCU, Security Report, Maintenance Department Report and OT List. - Patient's Complaints - Medical Certificates.

UNIT -III Hospital Administration: Hospital Committees: Role, Composition, Frequency of Meetings, Minutes of the Meetings, Follow up Actions. - Duties & Responsibilities of the Hospital Administrator/CEO - Role of Medical Superintendent, Resident Medical Officer, Night duty Executive; Public and guest relation: information regarding patients, medical information, attendants' management.

UNIT-IV: HRM in Hospitals: Nature and Scope of HRM – Meaning and Definition – Functions – Objectives – Organisation of HRM Department - Policy Evolution of Personnel - Duty Roster of various categories of Staff - Administration of Patient Related Schemes: Medical Insurance (Cashless Benefit), Central Government Health Scheme (CGHS), Ex-Servicemen Contributory Health Scheme (ECHS), Third Party Administrator (TPA), Employee's State Insurance (ESI) - Hospital Waste Management - Methods of Infection Control - Standard Operating Procedures (SOPs) - Availability of Materials: Critical Items, Stock Level, Procurement Methods.

UNIT V: Challenges in Hospital Administration

Disaster Management: Fire Fighting. Dealing with Crisis Situation, Mob violence, Bomb threat, Terrorist strike, Mass casualties, Political agitation, Prisoners - Hospital Security: Staff, Patients, New born babies, Female staff/Patients, Stores. - Application of Hospital Information System (HIS) & Management Information System (MIS) - Accreditation – Tele health - Health Tourism - Health Insurance and Managed Care.

References

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2. Goel S.L. & R. Kumar, Hospital Administration and Management, Deep & Deep Publications, New Delhi.
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12. Yashpal Sharma, Handbook on Hospital Administration, Durga Printers, Jammu.

Practical – 4**CONCURRENT FIELD WORK – IV**

Learning Outcome: *The students will...*

- Gain experience by applying the theoretical knowledge in the field
- Understand the functions and activities of field placement organization
- Acquire of the skills of applying the class learning into practice

In the Fourth semester field work, the students are placed in agencies according to their specialization and they undergo the field placement training under the close supervision of the agency personnel.

The students get hands on experience of the day –to- day functioning of the agency. They assist the agency in their routine functions of the organization and participate in all the professional activities. It provides them an opportunity to link theory with practice.

The students also undertake any assignments given to them by the agency; they may also undertake any research for the organization.

The CA marks are awarded by the supervisor out of 40 marks for the quality, regularity, initiatives, leadership, participation and team work.

At the end of the semester Viva Voce is conducted by an external examiner and marks are awarded out of 60

Main Paper**RESEARCH PROJECT**

Learning Outcome: *The students will...*

- Gain research methodology knowledge by undertaking a research project
- Understand the steps of research by its application
- Acquire the skills of undertaking a research project

Each student is assigned with a research supervisor. The students have to get the guidance and carryout the following steps and complete the research project within a semester.

1. Selection of Topic, Defining terms, Finalization of Objectives of Study.
2. Feasibility Study, Pilot Visit to the Field of Study
3. Detailed Research Proposal
4. Finalization of Research tool
5. Review of Literature and Bibliography
6. Finalization of Methodology Chapter.
7. Analysis and Interpretation
8. Main Findings and Suggestions
9. Summary and Conclusion
10. Submission of Bound Copy

The Internal Guide/supervisor evaluates the work of the student out of 25 marks for above components also considering the quality, punctuality and regularity of consultation and correction.

The students who do not submit the bound copy to the department by the deadline fixed by the department will not be permitted to sit for the viva.

The student submits the approved chapters as a bound volume. The project is valued for 75 marks in the semester end examination. The viva voce examination will be conducted by both the external examiner appointed by the university and the internal examiner/guide/teacher concerned. The average of the marks awarded in the viva voce by both the external examiner and the internal examiner will be intimated to the university along with the marks obtained by the candidate in the CIA.