GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
HYDERABAD-500016

(Autonomous – Affiliated to Osmania University)

Mapping of the Courses for the year 2018-19

2018-19
L.S.

9.3 Contributions of anthropology to the understanding of regionalism, communalism and ethnic and political movements.

BOTANY

PAPER-I

1. **Microbiology and Plant Pathology :**

Structure and reproduction/multiplication of viruses,viroids, bacteria, fungi and mycoplasma; Applications of microbiology in agriculture, industry, medicine and in control of soil and water pollution; Prion and Prion hypothesis.

Important crop diseases caused by viruses, bacteria, mycoplasma, fungi and nematodes; Modes of infection and dissemination; Molecular basis of infection and disease resistance/defence; Physiology of parasitism and control measures. Fungal toxins. Modelling and disease forecasting; Plant quarantine.

2. **Cryptogams :**

Algae, fungi, lichens, bryophytes, pteridophytes-structure and reproduction from evolutionary viewpoint; Distribution of Cryptogams in India and their ecological and economic importance.

3. **Phanerogams :**

Gymnosperms : Concept of Progymnosperms. Classification and distribution of gymnosperms. Salient features of Cycadales, Ginkgoales, Coniferales and Gnetales, their structure and reproduction. General account of Cycadofilicales, Bennettitales and Cordiaitailes; Geological time scale; Type of fossils and their study techniques.

Angiosperms : Systematics, anatomy, embryology, palynology and phylogency.

Taxonomic hierarchy; International Code of Botanical Nomenclature; Numerical taxomomy and chemotaxomomy; Evidence from anatomy, embryology and palynology.

Origin and evolution of angiosperms; Comparative account of various systems of classification of angiosperms; Study of angiospermic families— Mangnoliaceae, Ranunculaceae, Brassicaceae, Rosaceae, Fabaceae, Euphorbiaceae, Malvaceae, Dipterocarpaceae, Apiaceae, Asclepiadaceae, Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Asteraceae, Poaceae, Arecaceae, Liliaceae, Musaceae and Orchidaceae.

Stomata and their types; Glandular and non-glandular trichomes; Unusual secondary growth; Anatomy of C_3 and C_4 plants; Xylem and phloem differentiation; Wood anatomy.

Development of male and female gametophytes, pollination, fertilization; Endosperm—its development and function. Patterns of embryo development; Polyembroyony, apomixes; Applications of palynology; Experimental embryology including pollen storage and test-tube fertilization.

4. **Plant Resource Development :**

Domestication and introduction of plants; Origin of cultivated plants, Vavilov's centres of origin. Plants as sources for food, fodder, fibres, spices, beverages, edible oils, drugs,

narcotics, insecticides, timber, gums, resins and dyes; latex, cellulose, starch and its products; Perfumery; Importance of Ethnobotany in Indian context; Energy plantations; Botanical Gardens and Herbaria.

5. Morphogenesis :

Totipotency, polarity, symmetry and differentiation; Cell, tissue, organ and protoplast culture. Somatic hybrids and Cybrids; Micropropagation; Somaclonal variation and its applications; Pollen haploids, embryo rescue methods and their applications.

PAPER-II

1. Cell Biology :

Techniques of cell biology. Prokaryotic and eukaryotic cells—structural and ultrastructural details; Structure and function of extracellular matrix (cell wall) and membranes-cell adhesion, membrane transport and vesicular transport; Structure and function of cell organelles (chloroplasts, mitochondria, ER, dictyosomes ribosomes, endosomes,lysosomes, peroxisomes; Cytoskelaton and microtubules; Nucleus, nucleolus, nuclear pore complex; Chromatin and nucleosome; Cell signalling and cell receptors; Signal transduction Mitosis and meiosis; molecular basis of cell cycle. Numerical and structural variations in chromosomes and their significance; Chromatin organization and packaging of genome; Polytene chromosomes; B-chromosomes—structure, behaviour and significance.

2. Genetics, Molecular Biology and Evolution :

Development of genetics, and gene versus allele concepts (Pseudoalleles); Quantitative genetics and multiple factors; Incomplete dominance, polygenic inheritance, multiple alleles; Linkage and crossing over of gene mapping including molecular maps (idea of mapping, function); Sex chromosomes and sex-linked inheritance; sex determination and molecular basis of sex differentiation; Mutations (biochemical and molecular basis); Cytoplasmic inheritance and cytoplasmic genes (including genetics of male sterility).

Structure and synthesis of nucleic acids and proteins; Genetic code and regulation of gene expression; Gene silencing; Multigene families; Organic evolution-evidences, mechanism and theories.

Role of RNA in origin and evolution.

3. Plant Breeding, Biotechnology and Biostatistics :

Methods of plant breeding—introduction, selection and hybridization (pedigree, backcross, mass selection, bulk method); Mutation, polyploidy, male sterility and heterosis breeding. Use of apomixes in plant breeding; DNA sequencing; Genetic engineering—methods of transfer of genes; Transgenic crops and biosafety aspects; Development and use of molecular markers in plant breeding; Tools and techniques—probe, southern blotting, DNA fingerprinting, PCR and FISH. Standard deviation and coefficient of variation (CV). Tests of significance (Z-test, t-test and chi-square tests). Probability and distributions (normal, binomial and Poisson). Correlation and regression.

4. Physiology and Biochemistry :

Water relations, mineral nutrition and ion transport, mineral deficiencies.

Photosynthesis—photochemical reactions, photophosphorylation and carbon fixation pathways; C_3, C_4 and CAM pathways; Mechanism of pholem transport, Respiration (anerobic and aerobic, including fermentation)—electron transport chain and oxidative phosphorylation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid metabolism; Nitrogen fixation and nitrogen metabolism. Enzymes, coenzymes; Energy transfer and energy conservation. Importance of secondary metabolites. Pigments as photoreceptors (plastidial pigments and phytochrome). Plant movements; Photoperiodism and flowering, vernalization, senescence; Growth substances—their chemical nature, role and applications in agri-horticulture; growth indices, growth movements. Stress physiology (heat, water, salinity, metal); Fruit and seed physiology. Dormancy, storage and germination of seed. Fruit ripening—its molecular basis and manipulation.

5. **Ecology and Plant Geography :**

Concept of ecosystem; Ecological factors. Concepts and dynamics of community; Plant succession. Concepts of biosphere; Ecosystems; Conservation; Pollution and its control (including phytoreme-diation); Plant indicators; Environment (Protection) Act.

Forest types of India—'Ecological and ecomomic importance of forests, afforestation, deforestation and social forestry; Endangered plants, endemism IUCN categories, Red Data Books; Biodiversity and its conservation; Protected Area Network; Convention of Biological Diversity, Farmers' Rights; and Intellectual Property Rights; Concept of Sustainable Development; Biogeochemical cycles. Global warming and climatic change; Invasive species; Environmetal Impact Assessment; Phytogeographical regions of India.

CHEMISTRY

PAPER-I

1. **Atomic Structure :**

Heisenberg's uncertainty principle Schrodinger wave equation (time independent); Interpretation of wave function, particle in one- dimensional box, quantum numbers, hydrogen atom wave functions; Shapes of s, p and d orbitals.

2. **Chemical bonding :**

Ionic bond, characteristics of ionic compounds, lattice energy, Born-Haber cycle; covalent bond and its general characteristics, polarities of bonds in molecules and their dipole moments; Valence bond theory, concept of resonance and resonance energy; Molecular orbital theory (LCAO method); bonding H_2 +, H2 He_2 + to Ne_2, NO, CO, HF, CN^-, Comparison of valence bond and molecular orbital theories, bond order, bond strength and bond length.

3. **Solid State :**

Crystal systems; Designation of crystal faces, lattice structures and unit cell; Bragg's law; X-ray diffraction by crystals; Close packing, radius ratio rules, calculation of some limiting radius ratio values; Structures of NaCl, ZnS, CsCl, CaF_2; Stoichiometric and

B.Sc (CBCS) Botany- I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants
DSC - 1A (4 hrs./week-60 hours) 5 Credits
Theory Syllabus

UNIT – I **(15Hrs)**

1. Brief account of Archaebacteria, Actinomycetes. (4h)
2. Cyanobacteria: General characters, cell structure, thallusorganisation and their significance as biofertilizers with special reference to *Oscillatoria, Nostoc*and *Anabaena.*(6h)
3. Lichens: Structure and reproduction; ecological and economic importance.(5h)

UNIT- II **(15Hrs)**

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro. (7h)
5. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice.
Role of Bacillus thirungenesis in cultivation of Bt.cotton and Bt. Brinjal (8h)
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

UNIT-III **(15Hrs)**

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae.(3h)
8. Structure and reproduction of the following:
Chlorophyceae- *Volvox, Oedogonium*and*Chara.*(5h)
Phaeophyceae-*Ectocarpus*(2h)
Rhodophyceae- *Polysiphonia.*(3h)
9. Economic importance of algae in Agriculture and Industry.**Biofertilizers**(2h)

UNIT-IV **(15Hrs)**

10. General characters and classification of fungi (Ainsworth).(3h)
11. Structure and reproduction of the following: (10h)

a) Mastigomycotina- *Albugo*(b) Zygomycotina- *Mucor*
c) Ascomycotina- *Saccharomyces* and *Penicillium.*
d) Basidiomycotina- *Puccinia*
e) Deuteromycotina- *Cercospora*

12. Economic importance of fungi in relation to mycorrhizae and mushrooms.Generalaccountof mushroom cultivation(2h)

B-S
B.SADASIVAIAH

Sign of BoS
CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

B. Ruk...

Professor & Head
Department of Botany
Osmania University
Hyderabad-500 007

B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Title: Bryophytes, Pteridophytes, Gymnosperms and Paleobotany
DSC-1B (4 hrs./week-60hours)Credits- 5

Theory Syllabus

UNIT-I **(15Hrs)**

1. Bryophytes: General characters and classification.(3h)
2. Structure, reproduction, life cycle and systematic position of *Marchantia, Anthoceros* and*Polytrichum.* (Development stages are not required). (10h)
3. Evolution of Sporophyte in Bryophytes. (2h)

UNIT-II **(15Hrs)**

4. Pteridophytes: General characters and classification (Sporne's) (3h)
5. Structure, reproduction, life cycle and systematic position of *Rhynia, Lycopodium, Equisetum* and *Marsilea.* (10h)
6. Stelar evolution, heterospory and seed habit in Pteridophytes. (2h)

UNIT-III **(15Hrs)**

7. Gymnosperms: General characters, structure, reproduction and classification (Sporne's) (4h)
8. Distribution and economic importance of Gymnosperms. (3h)
9. Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus*and *Gnetum.* (8h)

UNIT-IV. **(15Hrs)**

10. Palaeobotany: Introduction, Fossils and fossilization ; Importance of fossils. (8h)
11. Geological time scale; (4h)
12. Bennettitales: General account. (3h)

Sign of BoS

CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

Professor & Head
Department of Botany
Osmania University
Hyderabad-500 007

(B. SADASIVAIAH)

20

B.SC.(CBCS) BOTANY –II YEAR
SEMESTER –III-PAPER-III
Title:TAXONOMY OF ANGIOSPERMS AND MEDICINAL BOTANY
DSC-IC (4hrs/Week-60hours) Credit -04
Theory Syllabus

UNIT-I (15Hrs)

1. Introduction : Principals of Plant systematics , Types of Classification: Artificial, Natural and Phylogenetic; Systems of Classification:salient features and Comparative account of Bentham and Hooker and Engler & prantle . An introduction to Angiosperm phylogeny Group (APG)

2. Current concepts in Angiosperm Taxonomy : Embryology in relation to taxonomy Cytotaxonomy,Chemotaxonomy and Numerical Taxonomy

3. Nomenclature and Taxonomic resources: An Introduction to ICBN , Vienna code –A brief Account Herbarium :Concept ,techniques and applications.

UNIT-II (15Hrs)

4. Systematic study and economicimportance of plants belonging to the following families

5. Polypetalae:
Annonaceae,Capparidaceae,Rutaceae,Fabaceae,Caesalpinaceae,Mimosaceae,Cucurbitaceae. Apiaceae
Gamopetalae: ,Asteraceae,Asclepiadeae,Lamiaceae
Monochlamydeae:Amaranthaceae,Euphobiaceae,Monocotyledons:Orchidaceae,andPoaceae.

UNIT-III (15Hrs)

6. Ethnomedicine : Scope,Interdisciplinary nature,distinction of Ethnomedicine from folklore medicine. (3h)

7. Outlines of Ayurveda,Sidda,Unani,and Homeopathic systems of traditional medicine.Role of AYUSH ,NMPB,CIMAP,and CDRI. (5h)

8. Plants in primary health care : Common Medicinal plants –
1.Tippateega (*Tinospora cordifolia*). 2.Tulasi (*Ocimum Sanctum*).
3.Pippallu (*piper longum*).4.Karakaya (*Terminalia chebula*)5..Kalabanda (*Aloe vera*).
6.Turmeric (*Curcuma longa*). (7h)

UNIT-IV (15Hrs)

10.Traditional medicine vs Modern medicine : study of selected plant examples used in traditional medicine as resource (active principles,structure ,usage and pharmacological action of modern medicine :
1.Aswagandha (*Withania somnifera*).2.Sarpagandha (*Rauwolfia serpentine*).
3.Nelausiri (*phillanthus amaros*). 4.Amla (*Phyllanthus emblica*)
5.JalaBrahmi(*Bacopa monnieri*) (8h)

11.Pharmacognosy : Introduction and scope. Adulteration of plant crude drugs and methods of identification–some examples.Indian pharmacopoeia. (4h)

12.Plant crude drugs: Types,methods of collection ,processing and storage practices. Evaluation of crude drugs (3h)

Sign of B.O.S.
CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

Professor & Head
Department of Botany
Osmania University
HYDERABAD-500 007

B.SC.(CBCS) BOTANY –II YEAR

SEMESTER –IV-PAPER-IV

PLANT ANATOMY AND EMBRYOLOGY

DSC-1D (4hrs./Week-60hours) Credit -04

Theory Syllabus

UNIT-I **(15Hrs)**

1. Meristems: Types, histological organization of shoot and root apices and theories (7h)
2. Tissues and Tissue Systems : Simple,Complex and special tissues (4h)
3. Leaf: Ontogeny,diversity of internal structure;stomata and epidermal outgrowths. (6h)

UNIT-II **(15Hrs)**

4. Stem and root anatomy : Vascular cambium –Formation and function. (3h)
5. Anomalous secondary growth of stem –
   1.*Achyranthus*,2.*Boerhavia*,3.*Bignonia*,4.*Dracaena*,5.Root(*Betavulgaris*) (5h)

6. Wood structure :General account. Study of local timbers –
   1.Teak(*Tectona grandis*),2.Rose wood (*Dalbergia latifolia*)
   3. (Red sanders,(*Pterocarpus santalinus*), 4.Nallamaddi (*Terminalia alata*)
   5. Neem (*Azadirachta indica*) (7h)

UNIT-III **(15Hrs)**

7. Introduction: History and importance of Embryology (2h)
8. Anther Structure, Microsporogenesis and and development of male gametophyte. (6h)
9. Ovule structure and Types; Megasporogenesis; types and development of female gametophyte. (7h)

UNIT-IV **(15Hrs)**

10. Pollination –Types; pollen –pistil interaction. Fertilization. (4h)
11. Endosperm-Development and types. Embryo-development and types: polyembryony and Apomixis-an outline (5h)
12. Palynology-pollen morphology,NPC system and applications of palynology. (6h)

Sign of CHAIRMAN
B.O.S. IN BOTANY
O.U. HYD.

Professor & Head
Department of Botany
Osmania University
Hyderabad-500 007

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
Syllabus-Total Hrs of Teaching 60 @ 4HRS/WEEK
B.sc. III YEAR -SEMESTER-V -PAPER-V(DSC)
(CELL BIOLOGY AND GENETICS)

CELL BIOLOGY:-

UNIT-I (12HRS)

1.**PLANT CELL ENVELOPS**:- Ultra structure of cell wall, molecular organization of cell membranes.

2. **NUCLEUS**:- Ultrastructure, Nucleic acids- structure and replication of DNA ; types and functions of RNA.

UNIT-II (15HRS)

3. **CHROMOSOMES**:- Morphology ,Organisation of DNA in a chromosome, Euchromatin and Hetero-chromatin, Karyotype. special types of chromosomes(Lamp brush, polytene and B- chromosomes).

4.Cell Division: Mitosis ,Meiosis, cell cycle and its regulation ,**Hypertrophy and Hyperplasia.**

GENETICS:-

UNIT-III (15HRS)

5. **MENDELISM**:- Genetic interactions/Modified Mendelian Ratios (Epistasis, complimentary sup-plementary and Inhibitory genes).

6. **LINKAGE AND CROSSING OVER**:- A brief account , construction of genetic maps,2-point and 3-point Test cross data.

7.**MUTATIONS** :- Chromosomal aberrations-structural and numerical changes; Gene mutations

UNIT-IV (18HRS)

8.**GENE EXPRESSION AND EXTRA NUCLEAR GENOME**: - organization of gene, transcription, transla-tion, mechanism and regulation Of gene expression in prokaryotes(Lac and Trp operon.

9. Mitochondrial (mt DNA),(cp DNA) and Plasmids.

Sign. Of B.O.S.

CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

Professor & Head
Department of Botany

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.

(AUTONOMOUS) CBCS

Syllabus-Total Hrs of Teaching 45

B.sc. III YEAR -SEMESTER-V -PAPER-V I DSE-1

(ECOLOGY AND BIODIVERSITY)

ECOLOGY:-

UNIT-I- (16Hrs)

1. CONCEPTS and COMPONENETS OF ECOSYSTEM:- Energy flow , food chains, food webs, ecological pyramids,Biogeochemical cycles –Carbon cycle (4h)
2. Definition of Environment; Atmosphere ,Hydro sphere, lithosphere and Biosphere(3h)
3. PLANTS AND ENVIRONMENT:-Ecological factors-Climatic (light and temperature), and biotic, Ecological adaptations of plants. (5h)
4. Edaphic factors; Soil-formation,weathering,mode of formation;transported;Colluvial, Alluvial,Glacial and Eolian; Soil Erosion and Conservation (4h)

UNIT-II-

5. POPULATION ECOLOGY:- Natality, mortality, growth curves, ecotypes and ecads (4h)
6. COMMUNITY ECOLOGY:- Frequency, density, cover, life forms, biological spectrum, ecological succession (Hydrosere , xerosere) (4h)
7. Community Dynamics: Succession-Serial stages, Modification of physical environment,climax formation with reference to Hydrosere and xerosere. (4h)
8. Production Ecology: Concepts of productivity- Primary and secondary productivity.(4h)

BIODIVERSITY

UNIT-III (6hrs)

9. BIODIVERSITY; Concepts, convention on biodiversity-Earth Summit (Copenhagen)
10. Biodiversity: Levels ,threats and Value
11. Flora of Telangana: Vegetation and Endemics.

UNIT-IV- (7hrs)

12. Hot Spots of India- North Eastern Himalayas, Western Ghats, Endemism IUCN Categories Red Data Book
13. PRINCIPLES OF CONSERVATION:- IUCN threat- categories, RED data book- threatened & endangered Plants of India. Role of organizations in the conservation of biodiversity-WWF& NBPGR

Sign of B.O.S. CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

Professor & Head
Department of Botany
Osmania University
Hyderabad-500 007

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
Syllabus-Total Hrs of Teaching 60hrs@ 4hrs/week
B.sc. III YEAR -SEMESTER-VI -PAPER-V II-DSC
(PLANT PHYSIOLOGY)

UNIT-I-

(16 Hrs.)

1. WATER RELATIONS:- Importance of water to plant life, physical properties Of water, diffusion, imbibitions, Osmosis& osmotic pressure ,water potentials; absorption& transport of water, Ascent of sap; transpiration, Stomata structure and movements.

2.MINERAL NUTRITION; Criteria of Essentiality of Elements, Essential macro and micro mineral nutrients and their role; symptoms of mineral Deficiency; absorption of mineral ions; passive and active absorption.

UNIT-II-

(16Hrs)

3. ENZYMES:- Nomenclature, IUB classification, mechanism and regulation of enzyme action. Enzyme kinetics factors regulating enzyme action.

4. PHOTOSYNTHESIS:- Photosynthetic pigments, absorption and action spectra; red drop and Emerson Enhancement effect; concept of two photo systems; mechanism of photosynthetic electron transport and evolution of oxygen; photo phosphorylation; carbon assimilation pathways:C3,C4 and CAM Photorespiration.

UNIT-III

(12Hrs)

5.TRANSLOCATION OF ORGANIC SUBSTANCES:-Mechanism of phloem transport; source –Sink Relationships

6.RESPRIATION:- Aerobic and Anaerobic; Glycol sis, Krebs' cycle; Electron transport system Mechanism of Oxidative phosphorylation, Pentose phosphate pathway.

UNIT-IV-

(16Hrs)

7.NITROGEN METABOLISM:-Biological Nitrogen fixation, Nitrate reduction, Ammonia assimilation.Protein Synthesis, mechanism of protein synthesis

8.Growth
Definition, phases and kinetics of growth
Physiological effects of Phyto hormones- Auxins, Gibberlins, Cytokinins,ABA, Ethylene and Brassinosteroids.

Professor & Head
Department of Botany
Osmania University
Hyderabad-500 007

Sign of B.O.S.
CHAIRMAN
B.O.S. IN BOTANY
O. U. HYD.

DEPARTMENT OF BOTANY

Syllabus-Total Hrs of Teaching 45@4 hrs/week

B.sc. III YEAR -SEMESTER-VI -PAPER-V III DSE-III

(TISSUE CULTURE &BIOTECHNOLOGY)

UNIT- I

TISSUE CULTURE:

1. -Introduction, sterilization procedures, explants culture media-composition and preparation Micropropagation. (4h).
2. Callus culture; cell and protoplast culture, somatic hybrids and cybrids (8h)

Unit-II

3. Application of tissue culture: production of pathogen free plants and soma clonal variants, production of Stress resistance plants, secondary metabolites and synthetic seeds. (6h)
4. Induction of hairy root and its application in production of secondary metabolites.(2h)

Unit-III

BIOTECHNOLOGY:

1. Introduction, history and scope and applications (3h)
2. DNA Recombinant Technology: Basic aspects of gene cloning.Enzymes used in gene cloning.Restriction enzymes Ligases ,polymerases. (8h)
3. Applications of biotechnology in agriculture. (2h)

Unit-IV

1. **Gene cloning:** Vectors-cloning vehicles, (Cosmids, plasmids, Bacteriophages and Phasmids)applications of r-DNA technology. (8h)
2. **Gene Libraries:** Genomic Libraries, cDNA libraries PCR and its applications. (4h)

Professor
Department of Botany
Osmania University
Hyderabad-500 007

Head of B.O. & MAN
CHAIRMAN
BOARD OF STUDIES
BOTANY
O. U. HYD.

Photosynthesis—photochemical reactions, photophosphorylation and carbon fixation pathways; C_3, C_4 and CAM pathways; Mechanism of pholem transport, Respiration (anerobic and aerobic, including fermentation)—electron transport chain and oxidative phosphorylation; Photorespiration; Chemiosmotic theory and ATP synthesis; Lipid metabolism; Nitrogen fixation and nitrogen metabolism. Enzymes, coenzymes; Energy transfer and energy conservation. Importance of secondary metabolites. Pigments as photoreceptors (plastidial pigments and phytochrome). Plant movements; Photoperiodism and flowering, vernalization, senescence; Growth substances—their chemical nature, role and applications in agri-horticulture; growth indices, growth movements. Stress physiology (heat, water, salinity, metal); Fruit and seed physiology. Dormancy, storage and germination of seed. Fruit ripening—its molecular basis and manipulation.

5. **Ecology and Plant Geography :**

Concept of ecosystem; Ecological factors. Concepts and dynamics of community; Plant succession. Concepts of biosphere; Ecosystems; Conservation; Pollution and its control (including phytoreme-diation); Plant indicators; Environment (Protection) Act.

Forest types of India—'Ecological and ecomomic importance of forests, afforestation, deforestation and social forestry; Endangered plants, endemism IUCN categories, Red Data Books; Biodiversity and its conservation; Protected Area Network; Convention of Biological Diversity, Farmers' Rights; and Intellectual Property Rights; Concept of Sustainable Development; Biogeochemical cycles. Global warming and climatic change; Invasive species; Environmetal Impact Assessment; Phytogeographical regions of India.

CHEMISTRY

PAPER-I

1. **Atomic Structure :**

Heisenberg's uncertainty principle Schrodinger wave equation (time independent); Interpretation of wave function, particle in one- dimensional box, quantum numbers, hydrogen atom wave functions; Shapes of s, p and d orbitals.

2. **Chemical bonding :**

Ionic bond, characteristics of ionic compounds, lattice energy, Born-Haber cycle; covalent bond and its general characteristics, polarities of bonds in molecules and their dipole moments; Valence bond theory, concept of resonance and resonance energy; Molecular orbital theory (LCAO method); bonding H_2^+, H2 He_2^+ to Ne_2, NO, CO, HF, CN^-, Comparison of valence bond and molecular orbital theories, bond order, bond strength and bond length.

3. **Solid State :**

Crystal systems; Designation of crystal faces, lattice structures and unit cell; Bragg's law; X-ray diffraction by crystals; Close packing, radius ratio rules, calculation of some limiting radius ratio values; Structures of NaCl, ZnS, CsCl, CaF_2; Stoichiometric and

nonstoichiometric defects, impurity defects, semi-conductors.

4. **The Gaseous State and Transport Phenomenon :**

   Equation of state for real gases, intermolecular interactions, and critical phenomena and liquefaction of gases; Maxwell's distribution of speeds, intermolecular collisions, collisions on the wall and effusion; Thermal conductivity and viscosity of ideal gases.

5. **Liquid State :**

   Kelvin equation; Surface tension and surface enercy, wetting and contact angle, interfacial tension and capillary action.

6. **Thermodynamics :**

   Work, heat and internal energy; first law of thermodynamics.

   Second law of thermodynamics; entropy as a state function, entropy changes in various processes, entropy-reversibility and irreversibility, Free energy functions; Thermodynamic equation of state; Maxwell relations; Temperature, volume and pressure dependence of U, H, A, G, Cp and Cv, ▯▯and▯▯ ; J-T effect and inversion temperature; criteria for equilibrium, relation between equilibrium constant and thermodynamic quantities; Nernst heat theorem, introductory idea of third law of thermodynamics.

7. **Phase Equilibria and Solutions :**

   Clausius-Clapeyron equation; phase diagram for a pure substance; phase equilibria in binary systems, partially miscible liquids—upper and lower critical solution temperatures; partial molar quantities, their significance and determination; excess thermodynamic functions and their determination.

8. **Electrochemistry :**

   Debye-Huckel theory of strong electrolytes and Debye-Huckel limiting Law for various equilibrium and transport properties.

   Galvanic cells, concentration cells; electrochemical series, measurement of e.m.f. of cells and its applications fuel cells and batteries.

   Processes at electrodes; double layer at the interface; rate of charge transfer, current density; overpotential; electroanalytical techniques : amperometry, ion selective electrodes and their use.

9. **Chemical Kinetics:**

   Differential and integral rate equations for zeroth, first, second and fractional order reactions; Rate equations involving reverse, parallel, consecutive and chain reactions; Branching chain and explosions; effect of temperature and pressure on rate constant. Study of fast reactions by stop-flow and relaxation methods. Collisions and transition state theories.

10. **Photochemistry:**

    Absorption of light; decay of excited state by different routes; photochemical reactions between hydrogen and halogens and their quantum yields.

11. **Surface Phenomena and Catalysis:**

Adsorption from gases and solutions on solid adsorbents; Langmuir and B.E.T. adsorption isotherms; determination of surface area, characteristics and mechanism of reaction on heterogeneous catalysts.

12. **Bio-inorganic Chemistry:**

Metal ions in biological systems and their role in ion-transport across the membranes (molecular mechanism), oxygen-uptake proteins, cytochromes and ferrodoxins.

13. **Coordination Chemistry :**

(i) Bonding in transition of metal complexes. Valence bond theory, crystal field theory and its modifications; applications of theories in the explanation of magnetism and elctronic spectra of metal complexes.

(ii) Isomerism in coordination compounds; IUPAC nomenclature of coordination compounds; stereochemistry of complexes with 4 and 6 coordination numbers; chelate effect and polynuclear complexes; trans effect and its theories; kinetics of substitution reactions in square-planar complexes; thermodynamic and kinetic stability of complexes.

(iii) EAN rule, Synthesis structure and reactivity of metal carbonyls; carboxylate anions, carbonyl hydrides and metal nitrosyl compounds.

(iv) Complexes with aromatic systems, synthesis, structure and bonding in metal olefin complexes, alkyne complexes and cyclopentadienyl complexes; coordinative unsaturation, oxidative addition reactions, insertion reactions, fluxional molecules and their characterization; Compounds with metal—metal bonds and metal atom clusters.

14. **Main Group Chemistry:**

Boranes, borazines, phosphazenes and cyclic phosphazene, silicates and silicones, Interhalogen compounds; Sulphur—nitrogen compounds, noble gas compounds.

15. **General Chemistry of 'f' Block Element:**

Lanthanides and actinides: separation, oxidation states, magnetic and spectral properties; lanthanide contraction.

PAPER-II

1. **Delocalised Covalent Bonding :**

Aromaticity, anti-aromaticity; annulenes, azulenes, tropolones, fulvenes, sydnones.

2. (i) **Reaction mechanisms** : General methods (both kinetic and non-kinetic) of study of mechanisms or organic reactions : isotopies, mathod cross-over experiment, intermediate trapping, stereochemistry; energy of activation; thermodynamic control and kinetic control of reactions.

(ii) **Reactive intermediates** : Generation, geometry, stability and reactions of carboniumions and carbanions, free radicals, carbenes, benzynes and nitrenes.

(iii) **Substitution reactions** :—S_N 1, S_N 2, and S_N i, mechanisms ; neighbouring group participation; electrophilic and nucleophilic reactions of aromatic compounds including heterocyclic compounds—pyrrole, furan, thiophene and indole.

(iv) **Elimination reactions** :—E1, E2 and E1cb mechanisms; orientation in E2 reactions—Saytzeff and Hoffmann; pyrolytic *syn* elimination—acetate pyrolysis, Chugaev and Cope eliminations.

(v) **Addition reactions** :—Electrophilic addition to C=C and C≡C; nucleophilic addition to C=O, C≡N, conjugated olefins and carbonyls.

(vi) **Reactions and Rearrangements** :—(a) Pinacol-pinacolone, Hoffmann, Beckmann, Baeyer-Villiger, Favorskii, Fries, Claisen, Cope, Stevens and Wagner—Meerwein rearrangements.

(b) Aldol condensation, Claisen condensation, Dieckmann, Perkin, Knoevenagel, Witting, Clemmensen, Wolff-Kishner, Cannizzaro and von Richter reactions; Stobbe, benzoin and acyloin condensations; Fischer indole synthesis, Skraup synthesis, Bischler-Napieralski, Sandmeyer, Reimer-Tiemann and Reformatsky reactions.

3. **Pericyclic reactions** :—Classification and examples; Woodward-Hoffmann rules—electrocyclic reactions, cycloaddition reactions [2+2 and 4+2] and sigmatropic shifts [1, 3; 3, 3 and 1, 5], FMO approach.

4. (i) **Preparation and Properties of Polymers**: Organic polymerspolyethylene, polystyrene, polyvinyl chloride, teflon, nylon, terylene, synthetic and natural rubber.

(ii) Biopolymers: Structure of proteins, DNA and RNA.

5. **Synthetic Uses of Reagents:**

OsO_4, HIO_4, CrO_3, $Pb(OAc)_4$, SeO_2, NBS, B_2H_6, Na-Liquid NH_3, $LiAlH_4$, $NaBH_4$, n-BuLi, MCPBA.

6. **Photochemistry** :—Photochemical reactions of simple organic compounds, excited and ground states, singlet and triplet states, Norrish-Type I and Type II reactions.

7. **Spectroscopy**:

Principle and applications in structure elucidation :

(i) **Rotational**—Diatomic molecules; isotopic substitution and rotational constants.

(ii) **Vibrational**—Diatomic molecules, linear triatomic molecules, specific frequencies of functional groups in polyatomic molecules.

(iii) **Electronic**—Singlet and triplet states. *n*□□□ and □□□□ transitions; application to conjugated double bonds and conjugated carbonyls Woodward-Fieser rules; Charge transfer spectra.

(iv) **Nuclear Magnetic Resonance (^{1}HNMR)**: Basic principle; chemical shift and spin-spin interaction and coupling constants.

(v) **Mass Spectrometry** :—Parent peak, base peak, metastable peak, McLafferty rearrangement.

CIVIL ENGINEERING

PAPER-I

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

I Semester

B.Sc. I Year **Chemistry-I** **60h (4h/w)**

Academic Year 2017-18
Inorganic, Organic, Physical & General

Chapters	Unit –I Inorganic chemistry	15h	Credits
I	s-block elements	2hrs	
II	p-block elements (up to group -15)	7hrs	
III	General Principles of Inorganic quantitative analysis	6hrs	
	Unit –II : Organic chemistry	**15hrs**	
I	Structural theory in organic chemistry	6hrs	03
II	Acyclic Hydrocarbons-	06hrs	
	Alicyclic Hydrocarbons	03hrs	
	Unit –III : Physical chemistry	**15hrs**	
I	Atomic structure and elementary quantum mechanics	6hrs	
II	Gaseous state	5hrs	
III	Liquid State	4hrs	
	Unit –IV: General chemistry	**15h**	
I	Chemical bonding	11hrs	
II	Evaluation of analytical data	04 hrs	
	Lab course: Preparation of Inorganic compounds, Semi micro analysis of Anions	45hrs	01

Unit-I (Inorganic Chemistry) **15h (1 hr/week)**

S1-I-1. s-block elements: **2 h**

General Characteristics of groups I and II elements, Diagonal relationship between Li and Mg, Be and Al

S1-I-2. p-block elements 1: **7 h**

Group–13:Synthesis and structure of diborane and higher Boranes (B_4H_{10} and B_5H_9), Boron nitrogen compounds ($B_3N_3H_6$ and BN), Lewis acid nature of BX_3

Group – 14: Carbides-Classification – ionic, covalent, interstitial – synthesis.Structures and reactivity. Industrial application. Silicones – Preapartion – a) direct silicon process b) use of Grignard reagent c) aromatic silylation. Classification – straight chain, cyclic and cross-linked.

Group – 15: Nitrides – Classification – ionic, covalent and interstitial. Reactivity – hydrolysis.Preparation and reactions of hydrazine, hydroxyl amine, phosphazenes.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. V. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyderabad.

S1-I-3. General Principles of Inorganic qualitative analysis **6 h**

Anion analysis: Theory of sodium carbonate extract, classification and reactions of anions-CO_3^{2-}, Cl^-, Br^-, SO_4^{2-}, PO_4^{3-}, BO_3^{3-} CH_3COO^-, NO_3^-

Cation Analysis: Principles involved - Solubility product, common ion effect, general discussion for the separation and identification of group I individual cations (Hg_2^{2+}, Ag^+, Pb^{2+}) with flow chart and chemical equations. Principle involved in separation of group II & IV cations.

General discussion for the separation and identification of group II (Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Sb^{2+}), III (Al^{3+}, Fe^{3+}), IV (Mn^{2+}, Zn^{2+}) individual cations with flow chart and chemical equations. Application of concept of hydrolysis in group V cation analysis. General discussion for the separation and identification of group V individual cations (Ba^{2+}, Sr^{2+}, Ca^{2+}) with flow chart and chemical equations. Theory of flame test. Identification of Group VI cations (Mg^{2+}, NH_4^+).

Unit - II (Organic Chemistry) **15h(1 hr/week)**

S1-O-1:Structural Theory in Organic Chemistry **6 h**

***Bond polarization*:** Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance - Mesomeric effect, application to (a) acidity of phenol. (b) acidity of carboxylic acids and basicity of anilines. Stability of carbo cations, carbanions and free radicals. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes.

***Types of organic reactions*:** Addition reactions- electrophilic, nucleophilic and free radical. Substitution reactions – electrophilic, nucleophilic and free radical. Elimination and Rearrangement reactions– Examples.

S1-O-2: Acyclic Hydrocarbons **6 h**

Alkanes– Methods of preparation: Corey-House reaction, Wurtz reaction, from Grignard reagent, Kolbe synthesis. Chemical reactivity - inert nature, free radical substitution, Halogenation example- reactivity, selectivity and orientation.

Alkenes -Preparation of alkenes (with mechanism) (a) by dehydration of alcohols (b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2 dihalides, Zaitsev's rule. Properties: Addition of Hydrogen – heat of hydrogenation and stability of alkenes. trans-addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti – Markonikov's addition). Oxidation (cis – additions) – hydroxylation by $KMnO_4$, OsO_4, trans addition- peracids (via epoxidation), hydroboration, ozonolysis – location of double bond. Dienes – Types of dienes, reactions of conjugated dienes – 1,2 and 1,4 addition of HBr to 1,3 – butadiene and Diels – Alder reaction.

Alkynes– Preparation by dehydrohalogenation of vicinal dihalides, dehalogenation of tetrahalides. Physical Properties: Acidity of terminal alkynes (formation of metal acetylides) preparation of higher alkynes, Chemical reactivity – electrophilic addition of X_2, HX, H_2O (tautomerism), Oxidation (formation of enediol, 1,2 diones and carboxylic acids) and reduction (Metal-ammonia reduction, catalytic hydrogenation)

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. [illegible]
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

S1-O-3: Alicyclic Hydrocarbons **3 h**

Nomenclature, preapartion by Freunds method, Dickmann, heating dicarboxylic metal salts. Properties – reactivity of cyclo propane and cyclo butane by comparing with alkanes. Stability of cycloalkanes – Baeyer strain theory, Sachse and Mohr predictions and Pitzer strain theory. Conformational structures of cyclopentane, cyclohexane.

Unit-III (Physical Chemistry) **15 h (1 hr/week)**

S1-P-1: Atomic structure and elementary quantum mechanics **6 h**

Black body radiation, heat capacities of solids, Rayleigh Jeans law, Planck's radiation law, photoelectric effect,Limitations of classical mechanics, Compton effect, De Broglie's hypothesis. Heisenberg's uncertainty principle, Schrodinger's wave equation and its importance. Physical interpretation of the wave function, significance of Ψ and Ψ_2, a particle in a box, energy levels, wave functions and probability densities. Schrodinger wave equation for H-atom. Separation of variables, radial and angular functions (only equation), hydrogen like wave functions, quantum numbers and their importance.

S1-P-2: Gaseous State **5 h**

Deviation of real gases from ideal behavior. van der Waals equation of state. Critical phenomenon. PV isotherms of real gases, continuity of state. Andrew's isotherms of CO_2. The van der Waal's equation and critical state. Derivation of relationship between critical constants and van der Waal's constants. The law of corresponding states, reduced equation of states. Joule Thomson effect and inversion temperature of a gas. Liquifaction of gases: i) Linde's method based on Joule Thomson effect ii) Claude's method based on adiabatic expansion of a gas.

S1-P-3: Liquid State **4 h**

Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). Liquid crystals, the mesomorphic state: Classification of liquid crystals in to Smectic and Nematic, differences between liquid crystal and solid / liquid. Application of liquid crystals as LCD devices.

Unit – IV (General Chemistry) **15 h (1 hr/week)**

S1-G-1 Chemical Bonding **11 h**

Ionic solids- lattice and solvation energy, solubility of ionic solids, Fajan's rule, polarity and polarizability of ions, covalent nature of ionic bond, covalent bond - Common hybridization and shapes of molecules.

Molecular orbital theory: Shapes and sign convention of atomic orbitals. Modes of overlapping. Concept of σ and π bonds. Criteria for orbital overlap. LCAO concept. Types of molecular orbitals- bonding, antibonding and non bonding. MOED of homonuclear diatomics - H_2, N_2,

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. [illegible]
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies In Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

O_2, O_2^+, O_2^-, F_2 (unhybridized diagrams only) and heteronuclear diatomics CO, CN, NO, NO^+ and HF. Bond order, stability and magnetic properties.

S1-G-2 Evaluation of analytical data **4 h**

Significant figures, accuracy and precision. Errors-classification of errors- determinate and indeterminate errors, absolute and relative errors, propagation of errors in mathematical operations – addition, substraction, division and multiplication (with respect to determinate errors).

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. [illegible]
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

II Semester

B.Sc. I Year **Chemistry-II** **60h (4h/w)**

Academic Year 2017-18
Inorganic, Organic, Physical & General

Chapters	Unit –I Inorganic chemistry	15h	Credits
I	p-block Elements	7hrs	03
II	Chemistry of Zero group elements	2hrs	
III	Chemistry of d-block elements	6hrs	
	Unit –II : Organic chemistry	**15hrs**	
I	Aromatic Hydrocarbons	7hrs	
II	Arenes and polynuclear Aromatic Hydrocarbons	3hrs	
III	Halogen compounds	5hrs	
	Unit –III : Physical chemistry	**15hrs**	
I	Solutions	5hrs	
II	Dilute Solutions & Colligative Properties	5hrs	
III	Solid state Chemistry	5hrs	
	Unit –IV: General chemistry	**15h**	
I	Theory of Quantitative Analysis	5hrs	
II	Theories of bonding in metals	5hrs	
III	Material Science	5hrs	
	Lab course: Preparation of Inorganic compounds, Semi micro analysis of Anions	45hrs	01

Unit-I (Inorganic Chemistry) **15 h (1 hr/week)**

S2-I-1 p-block Elements -II **7 h**

Oxides: Types of oxides (a) Normal- acidic, basic amphoteric and neutral (b) Mixed(c) sub oxide d) peroxide e) superoxide. Structure of oxides of C, N, P, S and Cl - reactivity, thermal stability, hydrolysis.

Oxy acids: Structure and acidic nature of oxyacids of B, C, N, P, S and Cl. Redox properties of oxyacids of Nitrogen: HNO_2 (reaction with $FeSO_4$, $KMnO_4$, $K_2Cr_2O_7$),

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P. INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyderabad-7.

HNO_3 (reaction with H_2S, Cu), HNO_4 (reaction with KBr, Aniline), $H_2N_2O_2$ (reaction with $KMnO_4$). Redox properties of oxyacids of Potasium: H_3PO_2 (reaction with $HgCl_2$), H_3PO_3 (reaction with $AgNO_3$, $CuSO_4$).
Redox properties of oxyacids of Sulphur: H_2SO_3 (reaction with $KMnO_4$, $K_2Cr_2O_7$), H_2SO_4 (reaction with Zn, Fe, Cu), $H_2S_2O_3$ (reaction with Cu, Au), H_2SO_5 (reaction with KI, $FeSO_4$), $H_2S_2O_8$ (reaction with $FeSO_4$, KI)
Interhalogens- classification- general preparation- structures of AB, AB_3, AB_5 and AB_7 type and reactivity. Poly halides- definition and structure of ICl_2^-, ICl_4^- and I_3^-
Comparison of Pseudohalogens with halogens.

S2-I-2 Chemistry of Zero group elements **2 h**
General preparation, structure, bonding and reactivity of Xenon compounds – Oxides, Halides and Oxy-halides. Clatherate compounds and Anomalous behavior of He (II)

S2-I-3Chemistry of d-block elements **6 h**
Characteristics of d-block elements with special reference to electronic configuration variable valence, ability to form complexes, magnetic properties &catalytic properties. Stability of various oxidation states and SRP Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu traids. Titanium triad – electronic configuration and reactivity of +3 and +4 states – oxides and halides. Chromium triad – reactivity of +3 and +6 states. Copper triad – reactivity of +1, +2 and +3 states.

Unit – II (Organic chemistry) **15 h (1 hr/week)**

S2-O-1: Aromatic Hydrocarbons **7h**
Concept of aromaticity –definition, Huckel's rule – application to Benzenoids and Non – Benzenoids (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation). Preapartions: From acetylene, phenols, benzene carboxylic acids and sulphonic acids Reactions - General mechanism of electrophilic substitution, mechanism of nitration, sulphonation,and halogenation, Friedel Craft's alkylation(polyalkylation) and acylation. Orientation of aromatic substitution - Definition of ortho, para, and meta directing groups. Ring activating and deactivating groups with examples. Orientation – (i) activating groups: Amino, methoxy and alkyl groups. (ii) Deactivating groups - carboxy, nitro, nitrile, carbonyl and sulphonic acid& halo groups.

S2-O-2: Arenes and Polynuclear Aromatic Hydrocarbons **3 h**
Preparation of alkyl benzenes by Friedel Craft's alkylation, Friedel Craft's acylation followed by reduction, Wurtz-Fittig reaction. Chemical reactivity: Ring substitution reactions,side chain substitution reactions and oxidation.
Polynuclear hydrocarbons – Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Reactivity towards electrophilic substitution. Nitration and sulphonation as examples.

S2-O-3: Halogen compounds **5 hrs**
Nomenclature and classification: alkyl (primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl. Chemical reactivity - reduction, formation of RMgX, Nucleophilic

Dr. K. PADMAVATI M.Sc, Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

substitution reactions – classification into S_{N1} and S_{N2}. Mechanism and energy profile diagrams of S_{N1} and S_{N2} reactions. Stereochemistry of S_{N2} (Walden Inversion) 2-bromobutane, S_{N1} (Racemisation) 1-bromo-1-phenylpropane explanation of both by taking the example of optically active alkyl halide. Structure and reactivity – Ease hydrolysis - comparison of alkyl, vinyl, allyl, aryl, and benzyl halides.

Unit – III (Physical Chemistry) **15 h (1 hr/week)**

S2-P-1: Solutions **5 h**

Liquid - liquid mixtures, ideal liquid mixtures, Raoult's and Henry's laws. Non ideal systems. Azeotropes HCl-H_2O and C_2H_5OH - H_2O systems. Fractional distillation,. Partially miscible liquids- Phenol – Water, Trimethyl amine – Water and Nicotine – Water systems. Lower upper consolute temperatures. Effect of impurity on consolute temperature.Immiscible liquids andsteam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law with solvent extraction.

S2-P-2: Dilute Solutions & Colligative Properties **5 h**

Dilute Solutions, Colligative Properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis - laws of osmotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, Van't hoff factor, degree of dissociation and assocoation of solutes.

S2-P-3: Solid state Chemistry **5 h**

Laws of Crystallography – (i) Law of Constancy of interfacial angles (ii) Law of Symmetry, Symmetry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). Xray diffraction by crystals; Derivation of Bragg's equation, Determination of structure of NaCl, KCl & CsCl (Bragg's method and Powder method).

Unit – IV (General Chemistry) **15 h (1 hr/week)**

S2-G-1: Theory of Quantitative Analysis **5 hours**

Volumetric Analysis: Introduction, standard solutions, indicators, end point, titration curves, Types of titrations: i)neutralization titration- principle, theory of acid base indicators, titration curves and selection of indicators- strong acid - strong base, strong acid –weak base, weak acid- strong base and weak acid –weak base.

Gravimetric analysis- Introduction, nucleation, precipitation, growth of precipitate, filtration and washing, drying and incineration of precipitate, coprecipitation and post precipitation. Determination of Ni^{2+}

S3-G-2: Theories of bonding in metals: **5 h**

Valence bond theory, Explanation of metallic properties and its limitations, Free electron

Dr. K. PADMAVATI M.Sc, Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P. INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators.

S2-G-3: Material Science **5 h**

Classification of materials- classification as metals, ceramics, organic polymers, composites, biological materials etc. The property of super conductivity of materials. Super conducting materials- elements, alloys and compounds. Properties of super conductors- zero resistivity, Meisener effect and thermal properties. Compositesmeaning of composites, advanced composites, classification –particle rein forced fiber reinforced and structural composites general characters of composite materials-Particlereinforced composites – large particle and dispersion- strengthened composite. Fiber reinforced composites (continuous and discontinuous fiber composites).

B.Sc Iyr CHEMISTRY PRACTICALS
Academic Year 2017-18

Semester - II **45**

(3h/w)

Laboratory Course	45hrs	Credits
Paper II - Qualitative Analysis - II **I Semi micro analysis of mixtures** Analysis of two anions and two cations in the given mixture. **Anions:** CO_3^{2-}, SO_3^{2-}, S^{2-}, Cl^-, Br^-, I^- CH_3COO^-, NO_3^- PO_4^{3-}, BO_3^{3-}, SO_4^{2-} **Cations:** Ag^+, Pb^{2+}, Hg^+, Hg^{2+} Pb^{2+}, Bi^{3+}, Cd^{2+}, Cu^{2+}, $As^{3+/5+}$, $Sb^{3+/5+}$, $Sn^{2+/4+}$ Al^{3+}, Cr^{3+}, Fe^{3+} Zn^{2+}, Ni^{2+}, Co^{2+}, Mn^{2+} Ca^{2+}, Sr^{2+}, Ba^{2+} Mg^{2+}, NH^{4+}	45hrs	

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Dr. K. PADMAVATI M.Sc. Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc II yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER III
Paper-III
Chemistry - III

Unit-I (Inorganic Chemistry) **15 h (1 hr/week)**

S3-I-1: Chemistry of f-block elements: **6 h**

Chemistry of Lanthanides:Position in periodic table,Electronic structure, oxidation state, ionic and atomic radii- lanthanide contraction- cause and consequences, anomalous behavior of post lanthanides-complexation- type of donor ligands preferred. Magnetic properties- paramagnetism. Colour and spectra, f-f transitions –occurrence and separation – ion exchange method, solvent extraction.

Chemistry of actinides- general features – electronic configuration, oxidation state, actinide contraction, colour and complex formation. Comparison with lanthanides.

S3-I-2: Symmetry of molecules **5 h**

Symmetry operations and symmetry elements in molecules. Definition of Axis of symmetry types of C_n, Plane of symmetry (σh, σv, σd) Center of symmetry and improper rotational axis of symmetry (S_n). Explanation with examples.

S3-I-3: Non – aqueous solvents **4 h**

Classification and characteristics of a solvent. Reactions in liquid ammonia – physical properties, auto-ionisation, examples of ammono acids and ammono bases. Reactions in liquid ammonia – precipitation, neutralization, solvolysis, solvation - solutions of metals in ammonia, complex formation, redox reactions. Reactions in HF – autoionisation, reactions in HF – precipitation, acid – base reactions, protonation.

Unit - II (Organic chemistry) 15 h (1 hr/week)

S3-O-1: Alcohols **6 hrs**

Preaparation: 1°, 2° and 3° alchols using Griganard reagent, Ester hydrolysis, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, $HX/ZnCl_2$ (Lucas reagent), esterification, oxidation with PCC, alk. $KMnO_4$, acidic dichromates, conc. HNO_3 and Oppenauer oxidation. Diols: Pinacol - pinacolone rearrangement

Phenols: Preapartion: (i) from diazonium salts of anilines, (ii) from benzene sulphonic acids and (iii) Cumene hydroperoxide method.

Properties: Acidic nature, formation of phenoxide and reaction with R-X, electrophilic substitution nitration, halogenation and sulphonation. Riemer Tiemann reaction, Gattermann-Koch reaction, Azo-coupling reaction, Schotton-Boumann raction, Houben-Hoesch condensation, $FeCl_3$ reaction.

Dr. K. PADMAVATI M.Sc. Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College,
Mahaboobnagar.

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyderabad.

S3-O-2: Ethers and epoxides **2 hrs**

Nomenclature, preparation by (a) Williamson's synthesis (b) from alkenes by the action of conc. H_2SO_4. Physical properties – Absence of Hydrogen bonding, insoluble in water, low boiling point. Chemical properties – inert nature, action of conc. H_2SO_4 and HI.

S3-O-3 Carbonyl compounds **7 h**

Nomenclature of aliphatic and aromatic carbonyl compounds and isomerism.

Praparation of aldehydes & ketones from acid chloride,1,3-dithianes, nitriles and from carboxylic acids. Special methods of preparing aromatic aldehydes and ketones by (a) Oxidation of arenes (b) Hydrolysis of benzal halides Physical properties – absence of Hydrogen bonding. Keto-enol tautomerism, polarisability of carbonyl groups, reactivity of the carbonyl groups in aldehydes and ketones. Chemical reactivity: Addition of [a] $NaHSO_3$ (b) HCN (c) RMgX (d) NH_3 (e) RNH_2 (f)NH_2OH(g) $PhNHNH_2$ (h) 2,4DNP (Schiff bases). Addition of H_2O to form hydrate (unstable), comparison with chloral hydrate (stable), addition of alcohols - hemi acetal and acetal formation. Base catalysed reactions with mechanism- Aldol, Cannizaro reaction, Perkin reaction, Benzoin condensation, haloform reaction, Knoevengeal condensation. Oxidation reactions – $KMnO_4$ oxidation and auto oxidation, reduction – catalytic hydrogenation, Clemmenson's reduction, Wolf- kishner reduction, Meerwein Pondoff Verly reduction, reduction with LAH, $NaBH_4$. Analysis – 2,4 –DNP test, Tollen's test, Fehlings test, Scihff'stest, haloform test (with equations).

.

UNIT – III (Physical Chemistry) **15 hr (1h / week)**

S3-P-1: Phase Rule **6 h**

Statement and meaning of the terms – Phase, Component and degrees of freedom, Gibb's Phase rule, phase equilibria of one component system – water system. Phase equilibria of two-component system – Solid-Liquid equilibria, simple eutectic – Pb-Ag system, desilverisation of lead. Solid solutions – compound with congruent melting point – Mg-Zn system and incongruent melting point – NaCl-H_2O system.

S3-P-2:Colloids& surface chemistry **9 h**

Definition of colloids. Classification of colloids. Solids in liquids (sols): preparations and properties – (including Kinetic, Optical and Electricalstability of colloids) Protective action. Hardy–Schultz law, Gold number. Liquids in liquids(emulsions): Types of emulsions, preparation and emusifier. Liquids in solids(gels); Classification, preparations and properties, General applications of colloids.

Micelles: Classification of surface active agents. Surfactant action, micellization and micellar interactions, Structure of micelles – spherical and laminar. Critical micellar concentration (CMC). Factors affecting the CMC of surfactants. Counter ion binding to micelles.

Adsorption: Types of adsorption, Factors influencing adsorption. Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm. Applications.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairman
Board of Studies in
Dept of Chemistry
Osmania University, Hyd-07.

Unit –IV (General Chemistry) **15 h (1h/week)**

S3-G-1: ***Nanomaterials:*** 3h

Nano structured materials – Definition, size, description of graphene, fullerenes, carbon nano tubes. Synthetic techniques, bottom-up-sol-gel method, top-down, electro deposition method. Production of carbon nano tubes – arc discharge, laser vaporization methods. General applications of nano materials.

S3-G-2: Stereochemistry of carbon compounds **10 h**

Isomerism: Definition of isomers. Classification of isomers: Constitutional and Stereoisomers - definition and examples. Constitutional isomers: chain, functional and positional isomers. Stereoisomers: enantiomers and diastereomers – definitions and examples.

Optical activity:Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and S_n axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans-1,2-dichlorocyclopropane). Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3-dibromopentane)Number of enantiomers and mesomers - calculation. D, L &, R, S configuration for asymmetric and disymmetric molecules (Allenes, spiro compounds and biphenyls), Cahn-Ingold-Prelog rules. Racemic mixture, Racemisation and Resolution techniques. Geometrical isomerism with reference to alkenes and cyclo alkanes– cis, trans and E, Z configuration.

S3-G-3: Conformational analysis

Classification of stereoisomers based on **2 h** energy. Definition and examples of conformational and configurational isomers. Conformational analysis of ethane, n-butane, 1,2-dichloroethane,2-chloroethanol and methylcyclohexane

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc II yr CHEMISTRY

SEMESTER WISE SYLLABUS
SEMESTER IV
Paper-IV
Chemistry - IV

Unit-I (Inorganic Chemistry) **15h (1 h/week)**

S4-I-1: Coordination Compounds-I **7 h**

Simple inorganic molecules and coordination complexes. Nomenclature – IUPAC rules, 1. Brief review of Werner's theory,Sidgwick's electronic interpretation and EAN rule and their limitations. (Valence bond theory (VBT) – postulates and application to (a) tetrahedral complexes $[Ni(NH_3)_4]^{2+}$, $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ (b) square planar complexes $[Ni(CN)_4]^{2-}$, $[Cu(NH_3)_4]^{2+}$, $[PtCl_4]^{2-}$ (c) octahedral complexes $[Fe(CN)_6]^{4-}$, $[Fe(CN)_6]^{-3}$, $[FeF_6]^{4-}$, $[Co(NH_3)_6]^{3+}$, $[CoF_6]^{3-}$. Limitations of VBT).2. Coordination number, coordination geometries of metal ions, types of ligands. 3. Isomerism in coordination compounds, stereo isomerism –(a)geometrical isomerism in (i) square planar metal complexes of the type$[MA_2B_2]$, $[MA_2BC]$, $[M(AB)_2]$, [MABCD]. (ii) Octahedral metal complexes of the type $[MA_4B_2]$, $[M(AA)_2B_2]$, $[MA_3B_3]$ using suitable examples, (b) Optical isomerism in (i). tetrahedral complexes [MABCD], (ii). Octahedral complexes $[M(AA)_2B_2]$, $[M(AA)_3]$ using suitable examples. Structural isomerism: ionization, linkage, coordination ligand isomerism using suitable examples.

S4-I-2:Organometallic Chemistry **4h**

Definition, nomenclature and classification of organometallic compounds.Methods of preparation, properties and applications of alkyl and aryl compounds of Li, Mg &Al. Preparation and properties of ferrocene.

S4-I-3: Metal carbonyls and related compounds **4h**

18 valence electron rule, classification of metal carbonyls: $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$ and $Cr(CO)_6$, Preparation and properties of Ni(CO)4.

UNIT - II (Organic chemistry) **15 h (1 hr/week)**

S4-O-1: Carboxylic acids and derivatives **6h**

Nomenclature, classification and methods of preparation a) Hydrolysis of Nitriles, amides and esters. b) Carbonation of Grignard reagents. Special methods of preparation of Aromatic Acids. Oxidation of the side chain of Arenes. Hydrolysis of benzotrichlorides. Kolbe reaction. Physical properties- hydrogen bonding, dimeric association, acidity – strength of acids with the examples of trimethyl acetic acid and trichloro acetic acid, Relative differences in the acidity of Aromatic, aliphatic acids& phenols. Chemical properties – Reactions involving H, OH and COOH groups -salt formation, anhydride formation, Acid halide formation, Esterification (mechanism) & Amide formation. Reduction of acid to the corresponding primary alcohol - via ester or acid chloride. Degradation of carboxylic acids by Huns Diecker reaction, Schmidt reaction (Decarboxylation). Arndt – Eistert synthesis, Halogenation by Hell – Volhard - Zelensky reaction. Carboxylic acid Derivatives – Reactions of acid halides, Acid anhydrides, acid amides and esters (mechanism of ester hydrolysis by base and acid).

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. T. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
GONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
University, Nalgonda-07.

S4-O-2: Synthesis based on Carbanions 3h

Acidity of -Hydrogens of withdrawing groups, structure of carbanion. Preparation of Aceto acetic ester (ethylacetoester) by Claisen condensation and synthetic application of Aceto acetic ester. (a) Acid hydrolysis and ketonic hydrolysis: Butanone, 3-Methyl 2-butanone. Preparation of (i) monocarboxylic acids ii) dicarboxylic acids (b) malonic ester – synthetic applications. Preparation of (i) substituted mono carboxylic acids and (ii) substituted dicarboxylic acids.

S4-O-3Nitro hydrocarbons: 6 h

Nomenclature and classification of nitro hydrocarbons. Structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity - halogenation, reaction with HNO_2 (Nitrous acid), Nef reaction, Mannich reaction,Michael addition and reduction. Aromatic Nitro hydrocarbons: Nomenclature, Preparation of Nitrobenzene by Nitration. Physical properties, chemical reactivity – orientation of electrophilic substitution on nitrobenzene. Reduction reaction of Nitrobenzenes in different media.

Unit – III (Physical Chemistry) **15 hr (1h / week)**

S4-P-1: Electrochemistry & EMF **15 h**

Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Migration of ions and Kholrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf's method for attackable electrodes. Applications of conductivity measurements: Determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Electrolyte and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurement. Computation of EMF. Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble salt and redox electrodes. Electrode reactions, Nernst equation, cell EMF and single electrode potential, standard Hydrogen electrode – reference electrodes (calamel electrode) – standard electrode potential, sign conventions, electrochemical series and its significance.

Applications of EMF measurements, Calculation of thermodynamic quantities of cell reactions (G, H and K). Determination of pH using hydrogen electrode, glass electrode and quinhydrone electrode, Solubility product of AgCl. Potentiometric titrations.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyderabad

Unit –IV (General Chemistry) **15 h (1h/week)**

S4-G-1: Pericyclic Reactions **5 h**

Concerted reactions. Molecular orbitals of ethene,1,3-butadiene and allyl radical. Symmetry properties. HOMO, LUMO. Thermal and photochemical pericyclic reactions. Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

S4-G-2: Synthetic Strategies **5 h**

Terminology – Target molecule (TM). Disconnection approach – Retrosynthesis, Synthon, Synthetic equivalent (SE). Functional group interconversion (FGI), Linear, Convergent synthesis. Retrosynthetic analysis of the following molecules: 1) acetophenone 2) cyclohexene and 3) phenylethylbromide.

S4-G-3: Asymmetric synthesis **5 h**

Definition and classification of stereoslective reactions: substrate, product stereoselective reactions, enantio and diastereo selective reactions. Stereospecific reaction – definition – example – dehalogenation of 1,2-dibromides induced by iodide ion. Enantoselective reactions – definition – example –Reduction of Ethylacetoacetate by Yeast. Diastereoselective reaction-definition-example:Acid catalysed dehydration of 1-phenylproponal and Grignard addition to 2-phenyl propanal. Definition and explanation of enantiomeric excess and diastereomeric excess.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd...

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

B.Sc III yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER V
Paper-V
Chemistry - V

Unit-I (Inorganic Chemistry) **11 h**

S5-I-1: Coordination compounds –II **9 h**

Crystal field theory (CFT)- Postulates of CFT, splitting patterns of d-orbitals in octahedral, tetrahedral, square planer with suitable examples. Crystalfield stabilization energies and its calculations for various d^n configurations in octahedral complexes. High Spin Low Spin complexes.

Magnetic properties of transition metal complexes- para, dia, ferro , anti ferromagnetic properties, determination of magnetic susceptibility (Guoy method), spin only formula, calculations of magnetic moments.

Electronic spectra of metal complexes – colour of transtion metal aqua complexes– d-d transitions.Detection of complex formation - basic principles of various methods- change in chemical properties, solubility, colour, pH, conductivity, magnetic susceptibility.

Thermodynamic and kinetic stability of transition of metal complexes . Stability of metal complexes –stepwise and overall stability constant andf their relationship.Factors effecting the stability constants. Chelate effect, determination of composition of complex by Job's method and mole ratio method.

Applications of coordination compounds

Applications of coordination compounds a) in quantitative and qualitative analysis with suitable examples b) in medicine for removal of toxic metal ions and cancer therapy c) in industry as catalysts polymerization – Ziegler Natta catalyst d) water softening .

S5-I-2: Boranes and Carboranes: **2 h**

Definition of clusters. Structures of boranes and carboranes- Wade's rules,closo, nido arachno Boranes and carboranes.

Unit-II (Organic Chemistry) **11 h**

S5-O-1: Amines, Cyanides and Isocyanides **7 h**

Amines:

Nomenclature, classification into 1^0, 2^0, 3^0Amines and Quarternary ammonium compounds. Preparative methods – 1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties and basic character – Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline- comparative basic strength of aniline, N-methylaniline and N,N- dimethyl aniline (in aqueous and non- aqueous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. 4. Chemical Properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation. 5. Reaction with Nitrous acid of 1^0, 2^0, 3^0 (Aliphatic and aromatic amines).

Dr. K. PADMAVATI M.Sc., Ph.D.
Lecturer in chemistry
Dr. B.R.R. Govt. Degree College, Jadcherla
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyderabad-07.

Electophilic substitutions of Aromatic amines – Bromination and Nitration, oxidation of aryl and 3^0 Amines, diazotisation. 6. Diazonium salts: Preparation with mechanism. Synthetic importance – a) Replacement of diazonium group by – OH, X (Cl)- Sandmeyer and Gatterman reaction, by fluorine (Schiemann's reaction), by iodine, CN, NO_2, H and aryl groups. Coupling Reaction of diazonium salts. i) with phenols ii) with anilines. Reduction to phenyl hydrazines.

Cyanides and isocyanides:

Nomenclature (aliphatic and aromatic) structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. 2. Properties of cyanides and isocyanides, a)hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

S5-O-2: Heterocyclic Compounds **4 h**

Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring systems – presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character – 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions.

Resonance structures: Indicating electron surplus carbons and electron deficient hetero atom. Explanation of feebly acidic character of pyrrol, electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – one method of preparation and properties – Reactivity towards Nucleophilic substitution reaction – chichibabin reaction.

Unit-III(Physical Chemistry)

S5-P-1: Chemical Kinetics **11 h**

Introduction to chemical kinetics, rate of reaction, variation of concentration with time, rate laws and rate constant. Specific reaction rate.Factors influencing reaction rates: effect of concentration of reactants, effect of temperature, effect of pressure, effect of reaction medium, effect of radiation, effect of catalyst with simple examples, order of reaction.

First order reaction, derivation of equation for rate constant. Characteristics of first order reaction. Units for rate constant. Half- life period, graph of 1^{st} order reaction, examples. Decomposition of H_2O_2 and decomposition of oxalic acid.

Pseudo first order reaction, Hydrolysis of methyl acetate, inversion of cane sugar, problems.

Second order reaction, derivation of expression for 2^{nd} order rate constant, examples- Saponification of ester, $2O_3$ ---→ $3O_2$, $C_2H_4 + H_2$ ------.> C_2H_6. characteristics of second order reaction, units for rate constants, half- life period and second order plots.

Dr. K. PADMAVATI M.Sc., Ph.D.
Lecturer in chemistry
Govt. Degree College for Women

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Zero order reaction: derivation of rate expression, examples i)combination of H_2 and Cl_2 to form HCl, ii) thermal decomposition of HI on gold surface characteristics of Zero order reaction units of k, half-life period and graph, problems.
Determination of order of reaction: i) method of integration, ii) half life method, iii) vant-Hoff differential method iv) Ostwald's isolation method. Problems
Kinetics of complex reactions (first order only): opposing reactions, parallel reactions, consecutive reactions and chain reactions. Problems.
Effect of temperature on reaction rate. Arrhenius equation. Temperature coefficient. Concept of energy of activation, determination of energy of activation from Arrhenius equation and by graphical method, problems.Simple collision theory based on hard sphere model explanation of frequency factor, orientation or steric factor. The transition state theory (elementary treatment).

Unit-IV (General Chemistry) **12 h**

S5-G-2: Molecular spectroscopy **8 h**

Introduction to electromagnetic radiation, interaction of electromagnetic rations with molecules, various types of molecular spectra.

Rotational spectroscopy (Microwave spectroscopy)
Rotational axis, moment of inertia, classification of molecules (based on moment of inertia), rotational energies, selection rules, determination of bond length of rigid diatomic molecules eg. HCl.

Infra red spectroscopy
Energy levels of simple harmonic oscillator, molecular vibration spectrum, selection rules. Determination of force constant. Qualitative relation of force constant to bond energies. Anharmonic motion of real molecules and energy levels. Modes of vibrations in polyatomic molecules. Characteristic absorption bands of various functional groups. Finger print nature of infrared spectrum.

Electronic spectroscopy:
Bonding and antibonding molecular orbitals,electronic energy levels of molecules (σ,π, n), types of electronic transitions: $\sigma - \sigma^*$, $n - \sigma^*$, $n - \pi^*$, $\pi - \pi^*$ with suitable examples.Selection rules,Terminology of chromophore, auxochrome, bathochromic and hypsochromic shifts. Absorption of characteristicsof chromophones: diene, enone and aromatic chromophores. Representation of UV-visible spectra.

S5-G-3: Photochemistry **4 h**
Introduction to photochemical reactions, Difference between thermal and photochemical reactions, Laws of photo chemistry- Grotthus - Drapper law, Stark – Einsteins Law of photo chemical equivalence.Quantum yield. Examples of photo chemical reactions with different quantum yields. Photo chemical combinations of $H_2 - Cl_2$ and $H_2 - Br_2$ reactions, reasons for the high and low quantum yield. Problems based on quantum efficiency,Consequences of light absorptions. Singlet and triplet states. Jablonski diagram Explanation of internal conversion, inter- system crossing, Phosphorescence,fluorescence.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

B.Sc. Chemistry III Year
Semester-V, Paper-VI
Elective- A (3 Credits)
Instrumental Methods of Analysis **45Hrs**

Unit I: Chromatography I **11Hrs**

S5-E-A-I: Solvent Extraction- Principle, Methods of extraction: Batch extraction, continuous extraction and counter current extraction. Application – Determination of Iron (III).
Chromatography: Classification of chromatographic methods, principles of differential migration, adsorption phenomenon, nature of adsorbents, solvent systems.

Thin layer Chromatography (TLC): Advantages, preparation of plates, development of the chromatogram, Detection of the spots, factors effecting Rf values and applications.

Paper Chromatography: Principle, choice of paper and solvent systems, development of chromatogram – ascending, descending, radial and two dimensional chromatography and applications.

Unit II: Chromatography II 11Hrs S5-E-A-I: Column Chromatography- Principle, Types of stationary phases, Column packing – Wet packing technique, Dry packing technique. Selection criteria of mobile phase solvents for eluting polar, non-polar compounds and its applications.

Ion exchange chromatography: Principle, cation and anion exchange resins, its application in separation of ions.

Gas Chromatography: Theory and instrumentation (Block Diagram), Types of stationary phases and carrier gases (mobile phase).

High performance liquid chromatography: Theory and instrumentation, stationary phases and mobile phases. Analysis of paracetamol.

Unit III: Colorimetry and Spectrophotometry 12Hrs S5-E-A-III: General features of absorption – spectroscopy, transmittance, absorbance, and molar absorptivity. Beer Lambert's law and its limitations, difference between Colorimetry and Spectrophotometry.

Instruments – Single beam UV- Visible Spectrophotometer, Double beam UV- Visible Spectrophotometer. Lamps used as energy sources. Verification of Beer's law. Estimation of iron in water samples by thiocyanate method. Estimation of (i) Chromium and (ii) Manganese in steel.

IR Spectrophotometer: Principle, Sources of Radiations, Sampling, Block diagram of FT-IR Spectrophotometer.

Unit IV: Electroanalytical methods **11Hrs**
S5-E-A-IV: Types of Electroanalytical Methods.

I) Interfacial methods – a) Potentiometry: Principle, Electrochemical cell, Electrodes- (i) Indicator and (ii) Reference electrodes – Normal Hydrogen Electrode, Quinhydrone Electrode, Saturated Calomel Electrode. Numerical Problems. Application of Potentiometry – Assay of Sulphanilamide

Dr. [illegible]
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Board of Studies in Chemistry
Osmania University

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc. Chemistry III Year
Semester-V, Paper-VI
Elective-B(3 Credits)
Industrial Chemistry and Catalysis 45 Hrs

Unit I: General Principles of Metallurgy and Production of Non Ferrous Metals 11 Hrs

S5-E-B-I: Pyrometallurgy: Drying and calcination, roasting, smelting, products of smelting, **Hydrometallurgy:** Leaching methods, leaching agents, leaching of metals, oxides and sulphides.

Separation of liquid and solid phases and processing of aqueous solutions
Electrometallurgy: Electrolysis, Refining electrolysis, electrolysis from aqueous solutions, fused-salt electrolysis

Refining processes: Chemical and physical refining processes

Production of selected non-ferrous metals (Copper, Nickel, Zinc): Properties, raw materials, production (flow charts presentations and chemical reactions involved) and uses.

Unit II: Natural and Synthetic Dyes 12Hrs

S5-E-B-II: Classification of dyes. Sources of natural dyes: Indigoid, Anthraquinone, Naphthoquinone, Benzoquinone, Flavonoid, Carotenoid and Tannin-based dyes.

Synthetic Dyes: Acidic, basic, dispersive, direct, reactive and vat dyes with examples. Extraction of natural dyes and their sustainability: The different methods for extraction of coloring materials from natural dyes. Aqueous extraction, alkali or acid extraction, microwave and ultrasonic assisted extraction, fermentation, solvent extraction, super critical fluid extraction. Drying methods. Application of natural dyes on textiles, Mordanting- types of mordanting - metallic mordants, oil mordants, Tannins and Tannic acid. Present scenario and sustainability issues in usage of natural dyes and cost considerations.

Unit III: Catalysis I 11Hrs S5-E-B-III: Homogeneous and heterogeneous catalysis - Definition of a catalyst and catalysis. Comparison of homogeneous and heterogeneous catalysis with specific examples. General characteristics of catalytic reactions.

Acid-base catalysis- Examples of acid and base catalysed reactions, hydrolysis of esters. Kinetics of acid catalysed reactions. Specific acid and general acid catalysis, Kinetics of base catalysed reactions. Specific base and general base catalysis. Examples-Aldol condensation and decomposition of nitramide, base catalysed conversion of acetone to di acetone alcohol. Effect of P^{H} on reaction rate of acid and base catalysed reactions.

Phase transfer catalysis: Principle of phase transfer catalysis, classification of phase transfer catalysts. Factors influencing the rate of PTC reactions.

Unit IV: Catalysis II 11Hrs S5-E-B-IV: Enzyme catalysis- Characteristics of enzyme catalysis, Examples: (i) Invertase in inversion of cane sugar (ii) Maltase in conversion of maltose to glucose (iii) Urease in decomposition of urea and (iv) Zymase in conversion of glucose to ethanol. Factors affecting enzyme catalysis. Effect of temperature, pH, concentration and inhibitor on enzyme catalysed reactions.

Dr. M. V. SAVITHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
GONDA-506254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc. III yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER VI
Paper-VII
Chemistry - VII

Unit-I (Inorganic Chemistry) **11 h**

S6-I-1:Inorganic reaction mechanisms **4h**

Labile and inert complexes, Thermodynamic and kinetic stability based on VBT & CFT: ligand substitution reactions – SN1 and S N2 in Octahedral complexes; substitution reactions of square planar complexes – Trans effect and applications of trans effect. Reactions of tetrahedral complexes – Hydrolysis of silicon halides and phosphorous oxides.

S6-I-2:Bioinorganic chemistry **5h**

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl^-). Toxic metal ions As, Hg & Pb.

Oxygen transport and storage – structure of hemoglobin, binding and transport of oxygen.

Fixation of CO_2 in photosynthesis- overview of light and dark reactions in photosynthesis. Structure of chlorophyll and coordination of magnesium. Electron transport in light reactions from water to $NADP^+$ (Z – scheme).

S6-I-3:Hard and soft acids bases (HSAB) **2h**

Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of reaction

UNIT - II (Organic Chemistry) **11 h**

S6-O-1:Carbohydrates **6 h**

Introduction: Classification and nomenclature – classification into mono, oligo and polysaccharides, into pentoses, hexoses ETC., into aldoses and ketoses.

Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation of glucose. Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acids). Number of optically active, isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (No proof for configuration is required). Evidence for cyclic structure of glucose (some negative aldehyde tests and mutarotation). Cyclic structure of glucose: Proposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 – ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane) Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure, Haworth formula).

Dy. Registrar
Associate Prof.
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Dr. K. PADMAVATI M.Sc, Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar.

Inter Conversion of Monosaccharides: Aldopentose to aldo hexose – eg: Arabinose to D-glucose, D- mannose (kiliani – Fischer method). Epimers, Epimerisation- Lobry de bruyn van Ekenstein rearrangement. Aldohexose – Aldopentose eg: D-glucose to D-arabinose by Ruff's degradation. Aldohexose(+) (glucose) to ketohexose (–)(Fructose) and Ketohexose (Fructose) to aldohexose (Glucose).

S6-O-2Amino acids and proteins **5 h**

acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples – Glycine, Alanine, valine and Leucene) by following methods: a) From halogenated Carboxylic acid b)Malonic ester synthesis c) strecker's synthesis.Physical properties: Optical activity of naturally occurring amino acids: L – configuration, irrespective of sign of rotation. Zwitter ion structure – salt like character, solubility, melting points, amphoteric character, definition of isoelectric point. Chemical properties: General reactions due to amino and carboxyl groups – Lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins, peptide synthesis

Unit-III (Physical Chemistry) **11 h**

S6-P-1:Thermodynamics –I **11h**

A brief review of - Energy, work and heat units, mechanical equivalent of heat, definition of system, surroundings. I law of thermodynamics statement- various forms mathematical expression. Thermodynamic quantities- extensive properties and intensive properties, state function, path functions energy as a state function, and exact differential. Work of expansion and heat absorbed as path function.

Expression for work of expansion, sign convention problems on I law. Heat changes at constant pressure and heat changes at constant volume. Enthalpy. Heat capacities at constant pressure and constant volume. Derivation Cp-Cv = R.

Isothermal adiabatic processes. Reversible and irreversible processes. Reversible change and maximum work. Derivation of expression for maximum work for isothermal reversible process. Problems. Internal energy of an ideal gas. Joules experiment and Joule-Thompson coefficient. Adiabatic changes in ideal gas derivation of equation, PV^{γ} = constant. P-V curves for isothermal and adiabatic processes.

Heat of a reaction at constant volume and at constant pressure, relation between ΔH and ΔV.

Variation of heat of reaction with temperature. Kirchhoff's equation and problems. Limitations of I law and need for II law. Statement of II law of thermodynamics. Cyclic process. Heat engine, Carnot's theorem, Carnot's cycle. Derivation of efficiency of heat engine problems. Thermodynamic scale of temperature.

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Che...
Osmania University, ...

Dr. K. PADMAVATI M.Sc, Ph.D.
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College, Jedcherla,
Mahaboobnagar,

Unit-IV 12 h

S6-G-1: Proton Magnetic Resonance Spectroscopy 4h

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals – spin-spin coupling, representation of proton NMR spectrum – Integrations. H NMR spectrum of – ethyl bromide, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate and acetophenone.

S6-G-2: Mass Spectrometry 4 h

Electron Impact Mass: Basic principles, Nitrogen rule, types of ions: Molecular ion, fragment ion and isotopic ions, representation of mass spectrum, types of peaks (molecular ion, fragment and isotopic ion peaks) Determination of molecular weight Mass spectrum of ethyl chloride, ethyl bromide and acetophenone.

S6-G-3: Thermodynamics- II 4 h

Entropy: Definition from Carnot's cycle. Entropy as a state function. Entropy as a measure of disorder. Sign of entropy change for spontaneous and non- spontaneous processes & equilibrium processes. Entropy changes in i). Reversible isothermal process, ii). reversible adiabatic process, iii). phase change, iv). reversible change of state of an ideal gas. Problems. Entropy of mixing inert perfect gases. Free energy Gibb's function (G) and Helmholtz's function (A) as thermodynamic quantities. Concept of maximum work and net work **ΔG as criteria for spontaneity. Derivation of equation ΔG =ΔH – TΔS. significance of the equation.** Gibbs equations and the Maxwell relations. Variation of G with P, V and T.

Chairperson
Board of Studies in Chemistry
Dept of Chem...
Osmania University, ...

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc. Chemistry III Year
Semester-VI, Paper-VIII
Elective-A (3 Credits)
Medicinal Chemistry 45Hrs

Unit- I:Introduction and Terminology 11Hrs

S6-E-A-I: Diseases: Common diseases, infective diseases–insect borne, air-borne, water-borne and hereditary diseases.

Terminology in Medicinal Chemistry: Drug, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, metabolites, anti metabolites and therapeutic index.

Drugs: Nomenclature: Chemical name, Generic name and Trade names with examples; Classification: Classification based on structures and therapeutic activity with examples. **ADME:** a) Absorption: Definition, absorption of drugs across the membrane – active and passive absorption, routes of administration of drugs. b) Distribution: definition and effect of plasma protein binding. c) Metabolism: definition, phase I and phase II reactions. d) Elimination: definition and renal elimination.

Unit-II: Enzymes and Receptors 11Hrs S6-E-A-II: Enzymes: Introduction. Mechanism and factors affecting enzyme action, Specificity of enzyme action (including stereo specificity), Enzyme inhibitors and their importance. Types of inhibition - reversible, irreversible and their subtypes with examples.

Receptors: Introduction, Drug action-receptor theory, Mechanism of drug action, concept of agonists and antagonists with examples. Drug receptor interactions involved in drug receptor complex. binding role of –OH group, $-NH_2$ group, quaternary ammonium salts and double bond. Structure – activity relationships of drug molecules, explanation with sulfonamides.

Unit- III: Synthesis and Therapeutic Activity of Drugs 12Hrs

S6-E-A-III: Introduction, synthesis and therapeutic activity of :

Chemotherapeutics: Sulphanilamide, dapsone, Pencillin-G (semi synthesis), Chloroquin, Isoniazid, Cisplatin and AZT.

Drugs to treat metabolic disorders: Anti diabetic - Tolbutamide; Antiinflammatiory – Ibuprofen; Cardiovascular- Glyceryl trinitrate; Antipyretic (paracetamol, aspirin) and Antacid- Omeprazole.

Drugs acting on nervous system: Anesthetics-definition, Classification-local and general. Volatile- Nitrous oxide, chloroform uses and disadvantages. Local anesthetics – benzocaine.

Unit- IV: Molecular Messengers and Health Promoting Drugs 11Hrs S6-E-A-IV: Molecular Messengers: Introduction to hormones and neurotransmitters. Thyroid hormones, Antithyroid drug-Carbimazol. Adrenaline: Adrenergic drugs- salbutamol, atenelol. Serotonin: SSRIs- fluoxetine. Dopamine: Antiparkinson drug- Levodopa.

Health promoting drugs: Introduction, sources, Deficiency disorders and remedy of Vitamins A,B, C, D, E K and micronutrients – Na, K, Ca, Cu, Zn and I .

Reference books

1. G.L. Patrick: Introduction to Medicinal Chemistry, Oxford University Press, New York. 2013.
2. Thomas Nogrady, Medicinal Chemistry, Oxford Univ. Press, New York.2005.
3. David William and Thomas Lemke, Foye's Principles of Medicinal Chemistry, Lippincott Williams & Wilkins, 2008.

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

B.Sc. Chemistry III Year
Semester –VI, Paper-VIII
Elective-B (3 Credits)
Agricultural and Fuel Chemistry 45 Hrs

Unit I: – Pesticides 12Hrs

S6-E-B-I: Introduction. Definition, classification of pesticides based on use (target). Toxicity and chemical structure with examples. Adverse effects of pesticides and its impact on environmental pollution.

Synthesis, technical manufacture and uses of representative pesticides in the following classes: Organochlorines (Cypermethrin); Organophosphates (Parathion); Carbamates (carbaryl); Quinones (Chloranil), Anilides (Alachlor).

Pesticide formulations: Dusts, Granules, Wettable powders, Emulsions and Aerosols. **Biopesteides :** Introduction: Potential pesticidal plants of India, Role of Neem in plant protection-constituents, Azadirachtin and its role in pest control, Structure and mode of action of Pyrethrins(pyrethrin-1) and Pyrethroids (permethrin) and nicotinoids (Imidacloprid).

Unit II: – Fertilizers 11Hrs

S6-E-B-II: Introduction: (need of fertilizers), functions of essential plant nutrients (N, P, K), Classification formula and uses of fertilizers:

Nitrogenous fertilizers : Ammonium nitrate, Urea, Calcium Cyanamide, Calcium Ammonium Nitrate, Sodium Nitrate, Ammonium Chloride and their uses.

Phosphate fertilizers: Normal super phosphate, Triple Super Phosphate, Ammonium Phosphate and their uses.

Potassium fertilizers: Potassium chloride, potassium nitrate, potassium sulphate and uses. **Complex fertilisers:** Diaammonium Phosphate and mixed fertilizers their uses. Manufacture of urea and Super phosphate of lime and their reactions in the soil.

Biofertilizers – Introduction, definition, classification, Rhizobium, Azatobactor, Azospirillium, Azolla, Blue Green Algae, Vermicomposting and uses.

Organic farming: The principal methods, crop rotation, green manures and compost, biological pest control, and mechanical cultivation and uses.

Unit III: Energy Sources and Coal 11Hrs. S6-E-B-III: Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.

Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Unit IV: Petroleum, Petrochemical Industry and Lubricants 11Hrs. S6-E-B-IV: Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications.

Fractional Distillation - Principle and process, Cracking -Thermal and catalytic cracking, Reforming of Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from

Dr. M. VASANTHA
Associate Professor, Dept. of Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 A.P INDIA

Chairperson
Board of Studies in Chemistry
Dept of Chemistry
Osmania University, Hyd-07.

Dr. K. PADMAVATI M.Sc, Ph.D,
Lecturer in chemistry,
Dr. B.R.R. Govt. Degree College Jedcherla,
Mahaboobnagar,

2018-19
Comm

Collection and disposal in rural and urban contexts, management of long-term ill-effects.

5. **Environmental pollution :**

Sustainable development. Radioactive wastes and disposal. Environmental impact assessment for thermal power plants, mines, river valley projects. Air pollution. Pollution control acts.

COMMERCE AND ACCOUNTANCY

PAPER-I

Accounting and Finance

Accounting, Taxation & Auditing

1. **Financing Accounting :**

Accounting as a financial information system; Impact of behavioural sciences. Accounting Standards e.g., Accounting for Depreciation, Inventories, Research and Development Costs, Long-term Construction Contracts, Revenue Recognition, Fixed Assets, Contingencies, Foreign Exchange Transactions, Investments and Government Grants, Cash Flow Statement, Earnings per Share.

Accounting for Share Capital Transactions including Bonus Shares, Right Shares.

Emplyees Stock Option and Buy-Back of Securities.

Preparation and Presentation of Company Final Accounts.

Amalgamations, Absorption and Reconstruction of Companies.

2. **Cost Accounting :**

Nature and functions of cost accounting. Installation of Cost Accounting System. Cost Concepts related to Income Measurement, Profit Planning, Cost Control and Decision Making.

Methods of Costing: Job Costing, Process Costing, Activity Based Costing.

Volume-cost-Profit Relationship as a tool of Profit Planning.

Incremental Analysis/Differential Costing as a Tool of Pricing Decisions, Product Decisions, Make or Buy Decisions, Shut-Down Decisions etc.

Techniques of Cost Control and Cost Reduction : Budgeting as a Tool of Planning and Control. Standard Costing and Variance Analysis.

Responsibility Accounting and Divisional Performance Measurement.

3. **Taxation :**

Income Tax: Definitions. Basis of charge; Incomes which do not form part of total income. Simple problems of Computation of Income (of individuals only) under various heads, i.e., Salaries, Income from House Property, Profits and Gains from Business or Profession, Capital Gains, Income from other sources, Income of other Persons included in Assessee's Total Income.

Set-off and Carry forward of Loss.

Deductions from Gross Total Income.

Salient Features/Provisions Related to VAT and Services Tax.

4. **Auditing :**

Company Audit: Audit related to Divisible Profits, Dividends, Special investigations, Tax audit.

Audit of Banking, Insurance, Non-Profit Organization and Charitable Societies/Trusts/Organizations.

Financial Management, Financial Institutions and Markets

1. **Financial Management :**

Finance Function : Nature, Scope and Objectives of Financial Management : Risk and Return Relationship.

Tools of Financial Analysis: Ratio Analysis, Funds-Flow and Cash-Flow Statement.

Capital Budgeting Decisions: Process, Procedures and Appraisal Methods. Risk and Uncertainty Anlysis and Methods.

Cost of Capital : Concept, Computation of Specific Costs and Weighted Average Cost of Capital. CAPM as aTool of Determining Cost of Equity Capital.

Financing Decisions: Theories of Capital Structure—Net Income (NI) Approach.

Net Operating Income (NOI) Approach, MM Approach and Traditional Approach. Designing of Capital structure: Types of Leverages (Operating, Financial and Combined), EBIT-EPS Analysis, and other Factors.

Dividend Decisions and Valuation of Firm : Walter's Model, MM Thesis, Gordan's Model Lintner's Model. Factors Affecting Dividend Policy.

Working Capital Management: Planning of Working Capital. Determinants of Working Capital. Components of Working Capital—Cash, Inventory and Receivables.

Corporate Restructuring with focus on Mergers and Acquisitions (Financial aspect only).

2. **Financial Markets and Institutions :**

Indian Financial System: An Overview

Money Markets: Participants, Structure and Instruments. Commercial Banks. Reforms in Banking Sector. Monetary and Credit Policy of RBI. RBI as a Regulator.

Capital Market : Primary and Secondary Market. Financial Market Instruments and Innovative Debt Instruments; SEBI as a Regulator.

Financial Services : Mutual Funds, Venture Capital, Credit Rating Agencies, Insurance and IRDA.

PAPER-II

Organisation Theory and Behaviours, Human Resource Management and Industrial Relations

Organisation Theory and Behaviour

1. **Organisation Theory :**

Nature and Concept of Organisation; External Environment of Organisation—Technological, Social, Political, Ecomomical and Legal; Organizational Goals Primary and Secondary Goals, Single and Multiple Goals; Management by Objectives.

Evolution of Organisation theory : Classical Neo-classical and system approach.

Modern Concepts of Organisation Theory : Organisational Design, Organisational

Structure and Organisational Culture.

Organisational Design—Basic Challenges; Differentiation and Intergration Process; Centralization and Decentralization Process; Standardization/Formalization and Mutual Adjustment. Coordinating Formal and Informal Organizations. Mechanistic and Organic Structures.

Designing Organizational structures—Authority and Control; Line and Staff Functions, Specialization and Coordination. Types of Organization Structure—Functional. Matrix Structure, Project Structure. Nature and Basis of Power, Sources of Power, Power Structure and Politics. Impact of Information Technology on Organizational Design and Structure.

Managing Organizational Culture.

2. **Organisation Behaviour :**

Meaning and Concept; Individual in organization: Personality, Theories, and Determinants; Pereception Meaning and Process.

Motivation : Concepts, Theories and Applications. Leadership—Theories and Styles. Quality of Work Life (QWL): Meaning and its impact on Performance, Ways of its Enhancement. Quality Circles (QC)—Meaning and their Importance. Management of Conflicts in Organizations. Transactional Analysis, Organizational Effectiveness, Management of Change.

Human Resources Management and Industrial Relations

1. **Human Resources Management (HRM) :**

Meaning Nature and Scope of HRM, Human Resource Planning, Job Analysis, Job Description, Job Specification, Recruitment Process, Selection Process, Orientational and Placement, Training and Development Process, Performance Appraisal and 360° Feed Back, Salary and Wage Administration, Job Evaluation, Employee Welfare, Promotions, Transfers and Separations.

2. **Industrial Relations (IR) :**

Meaning, Nature, Importance and Scope of IR, Formation of Trade Union, Trade Union Legislation, Trade Union Movement in India. Recognition of Trade Unions, Problems of Trade Unions in India. Impact of Liberalization on Trade Union Movement.

Nature of Industrial Disputes: Strikes and Lockouts, Causes of Disputes, Prevention and Settlement of Disputes.

Worker's Participation in Management: Philosophy, Rationale, Present Day Status and Future Prospects.

Adjudication and Collective Bargaining.

Industrial Relations in Public Enterprises Absenteeism and Labour Turnover in Indian Industries and their Causes and Remedies.

ILO and its Functions.

ECONOMICS

PAPER—I

1. **Advanced Micro Economics :**

(a) Marshallian and Walrasian Approaches to Price determination.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16 (An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS / TAX PROCEDURES & PRACTICE)CBCS SEMESTER – I

FINANCIAL ACCOUNTING - I

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40 I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM101

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire conceptual knowledge of basics of accounting.
2. Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP.
3. Describe the role of accounting information and its limitations.
4. Equip with the knowledge of accounting process and preparation of final accounts of sole trader.
5. Identify and analyze the reasons for the difference between cash book and pass book balances.
6. Recognize circumstances providing for increased exposure to errors and frauds.

Objective: To acquire conceptual knowledge of basics of accounting and preparation of final accounts of sole trader.

UNIT-I: ACCOUNTING PROCESS: Financial Accounting: Introduction – Definition – Evolution – Functions Advantages and Limitations –Users of Accounting Information- Branches of Accounting – Accounting Principles: Concepts and Conventions- Accounting Standards– Meaning – Importance – List of Accounting Standards issued by ASB -– Accounting System- Types of Accounts – Accounting Cycle- Journal- Ledger and Trial Balance. (Including problems)

UNIT-II: SUBSIDIARY BOOKS: Meaning –Types - Purchases Book - Purchases Returns Book - Sales Book - - Sales Returns Book - Bills Receivable Book - Bills Payable Book -- Cash Book - Single Column, Two Column, Three Column and Petty Cash Book - Journal Proper.(Including problems)

UNIT-III: BANK RECONCILIATION STATEMENT: Meaning – Need - Reasons for differences between cash book and pass book balances – Favourable and over draft balances – Ascertainment of correct cash book balance (Amended Cash Book) - Preparation of Bank Reconciliation Statement. (Including problems)

UNIT-IV: RECTIFICATION OF ERRORS AND DEPRECIATION: Capital and Revenue Expenditure – Capital and Revenue Receipts: Meaning and Differences - Differed Revenue Expenditure. Errors and their Rectification: Types of Errors - Suspense Account – Effect of Errors on Profit. (Including problems) Depreciation (AS-6): Meaning – Causes – Difference between Depreciation, Amortization and Depletion - Objectives of providing for depreciation – Factors affecting depreciation – Accounting Treatment – Methods of depreciation: Straight Line Method - Diminishing Balance Method (Including problems)

UNIT-V: FINAL ACCOUNTS: Final Accounts of Sole Trader: Meaning -Uses -Preparation of Manufacturing, Trading and Profit & Loss Account and Balance Sheet – Adjustments – Closing Entries.(Including problems)

SUGGESTED READINGS: 1. Accountancy-I: Haneef and Mukherjee, Tata McGraw Hill Company. 2. Principles & Practice of Accounting: R.L.Gupta&V.K.Gupta, Sultan Chand.
3. Accountancy-I: S.P. Jain & K.L Narang, Kalyani Publishers.
4. Accountancy–I: Tulasian, Tata McGraw Hill Co.
5. Introduction to Accountancy: T.S.Grewal, S.Chand and Co.
6. Advanced Accountancy-I: S.N.Maheshwari&V.L.Maheswari, Vikas.

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS / TAX PROCEDURES & PRACTICE)CBCS SEMESTER – I

BUSINESS ORGANISATION AND MANAGEMENT

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40 I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM102

COURSE OUTCOMES

After completion of the course the student is able to:

1. Understand the scope of Business, and its importance.
2. Describe the Social Responsibility and Ethics of Business
3. Analyse different forms of business organizations
4. Identify various vital documents of a company
5. Learn various sources Industrial Financial resources
6. Explain the functioning of Stock Exchanges & Mutual funds.

Objective: To acquaint the students with the basics of Commerce and Business concepts and functions, forms of Business Organization and functions of Management.

UNIT-I: INTRODUCTION AND FORMS OF BUSINESS ORGANISATIONS: Concepts of Business, Trade, Industry and Commerce - Objectives and functions of Business –Social Responsibility of a business - Forms of Business Organization - Meaning, Characteristics, Advantages and Disadvantages of Sole Proprietorship – Meaning, Characteristics, Advantages and Disadvantages of Partnership - Kinds of Partners - Partnership Deed -Concept of Limited liability partnership – Meaning, Characteristics, Advantages and Disadvantages of Hindu Undivided Family – Meaning, Advantages and Disadvantages of Co-Operative Organization.

UNIT-II: JOINT STOCK COMPANY: Joint Stock Company - Meaning - Definition - Characteristics - Advantages and Disadvantages - Kinds of Companies - Promotion - Stages of Promotion - Promoter - Characteristics - Kinds - Preparation of Important Documents - Memorandum of Association - Clauses - Articles of Association - Contents – Prospectus - Contents – Red herring Prospectus- Statement in lieu of Prospectus (As per Companies Act. 2013).

UNIT-III: INTRODUCTION TO FUNCTIONS OF MANAGEMENT: Management - Meaning - Characteristics - Functions of Management - Levels of Management – Skills of Management- Scientific Management - Meaning - Definition - Objectives - Criticism – Fayol's 14 Principles of Management .

UNIT-IV: PLANNING AND ORGANISING: Meaning - Definition - Characteristics - Types of Plans - Advantages and Disadvantages – Approaches to Planning - Management by Objectives (MBO) - Steps in MBO - Benefits – Weaknesses—Definition of Organizing-Organization-Process of Organizing - Principles of Organization - Formal and Informal Organizations - Line, Staff Organizations - Line and Staff Conflicts - Functional Organization - Span of Management - Meaning - Determining Span - Factors influencing the Span of Supervision. **UNIT-V: AUTHORITY, COORDINATION AND CONTROL:** Meaning of Authority, Power, responsibility and accountability - Delegation of Authority - Decentralization of Authority - Definition, importance, process, and principles of Coordinationtechniques of Effective Coordination - Control - Meaning - Definition – Relationship between planning and control -Steps in Control – Types (post, current and pre-control) - Requirements for effective control.

SUGGESTED READINGS: 1.Business Organization & Management: Sharma Shashi K. Gupta, Kalyani Publishers 2.Business Organisation& Management: Patrick Anthony, Himalaya Publishing House 3.Business Organization & Management: Dr. Manish Gupta, PBP. 4.Organization & Management: R. D. Agarwal, McGraw Hill. 5.Modern Business Organization: S.A. Sherlekar, V.S. Sherlekar, Himalaya Publishing House 6.Business Organization & Management: C.R. Basu, Tata McGraw Hill 7.Business Organization & Management: M.C. Shukla S. Chand,

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS /TAX PROCEDURES & PRACTICE)CBCS SEMESTER – II

FINANCIAL ACCOUNTING-II

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:**5

COURSE CODE : BCOM201

COURSE OUTCOMES

After completion of the course the student is able to:

1. Appreciate the need for negotiable instruments and procedure of accounting for them
2. Evaluate the concept of Consignment and learn its accounting treatment
3. Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture. 4. Determine the ascertainment of profit under Single Entry system.
5. Understand the meaning and features of Non-Profit Organizations
6. Prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations.

Objective: To acquire accounting knowledge of bills of exchange and other business accounting methods.

UNIT-I: BILLS OF EXCHANGE: Bills of Exchange - Definition- Distinction between Promissory note and Bills of exchange Accounting treatment of Trade bills: Books of Drawer and Acceptor- Honour and Dishonour of Bills Renewal of bills- Retiring of bills under rebate- Accommodation bills.(Including problems) **UNIT-II: CONSIGNMENT ACCOUNTS:** Consignment – Meaning – Features– Proforma invoice - Account sales – Del credere commission-Accounting treatment in the books of the consignor and the consignee - Valuation of consignment stock –Treatment of Normal and abnormal Loss - Invoice of goods at a price higher than the cost price. (Including problems)

UNIT-III: JOINT VENTURE ACCOUNTS: Joint Venture – Meaning –Features-Difference between Joint Venture and Consignment Accounting Procedure-Methods of Keeping Records for Joint Venture Accounts-Method of Recording in co-ventures books-Separate Set of Books Method- Joint Bank Account Memorandum Joint Venture Account (Including problems)

UNIT-IV: ACCOUNTS FROM INCOMPLETE RECORDS: Single Entry System – Meaning -Features–Difference between Single Entry and Double Entry systems -Defects in Single Entry System - Books and accounts maintained - Ascertainment of Profit - Statement of Affairs and Conversion method (Including problems) **UNIT-V: ACCOUNTING FOR NON-PROFIT ORGANIZATIONS:** Non- Profit Organization – Meaning – Features – Receipts and Payments Account – Income and Expenditure Account – Balance Sheet(Including problems)

SUGGESTED READINGS:

1. Accountancy-I: Haneef and Mukherjee, Tata McGraw Hill Co.
2. Principles and Practice of Accounting: R.L. Gupta & V.K. Gupta,Sultan Chand & Sons.
3. Accountancy–I: Tulasian, Tata McGraw Hill Co.
4. Accountancy–I: S.P. Jain & K.L Narang, Kalyani.
5. Advanced Accountancy-I: S.N.Maheshwari&V.L.Maheswari, Vikas.
6. Advanced Accountancy: M Shrinivas& K Sreelatha Reddy, Himalaya Publishers.
7. Financial Accounting: M.N Arora, Tax Mann Publications.

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – II

BUSINESS LAWS

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM202

COURSE OUTCOMES

After completion of the course the student is able to:

1. Demonstrate, understand and communicate all the Legal Terminology of Business.
2. Understanding Development of Business Law in India.
3. Outline Essentials of a valid Contract and agreements expressly declared to be void.
4. Wagering Agreements from Contingent contracts and classify different modes of Discharge. 5. Acquire knowledge about Sale of Goods Act 1930 and Consumer Protection Act 1986. 6. Explain Intellectuals Property Rights , Information Technology Act & Environmental Protection Act. **Objective:** To understand basics of contract act, sales of goods act, IPRs and legal provisions applicable for establishment, management and winding up of companies in India.

UNIT–I: INDIAN CONTRACT ACT: Agreement and contract - Essentials of a valid contract - Types of contracts - Offer and Acceptance - Essentials of valid offer and acceptance - Communication and revocation of offer and acceptance – Consideration definition - Essentials of valid consideration -Modes of Discharge of a contract - Performance of Contracts - Breach of Contract - Remedies for Breach - Significance of Information Technology Act. **UNIT–II: SALE OF GOODS ACT AND CONSUMER PROTECTION ACT:** Contract of Sale: Essentials of Valid Sale - Sale and Agreement to Sell – Definition and Types of Goods - Conditions and Warranties - Caveat Emptor - Exceptions - - Unpaid Seller - Rights of Unpaid Seller. Consumer Protection Act 1986: Definitions of Consumer – Person – Goods - Service - Consumer Dispute - Consumer Protection Councils - Consumer Dispute Redressal Agencies - Appeals. **UNIT–III: INTELLECTUAL PROPERTY RIGHTS:** Trade Marks: Definition - Registration of Trade Marks - Patents: Definition - Kinds of Patents - Transfer of the Patent Rights - Rights of the Patentee - Copy Rights: Definition -- Rights of the Copyright Owner - Terms of Copy Right - Copy Rights Infringement - Other Intellectual Property Rights: Trade Secrets - Geographical Indications.

UNIT–IV: MANAGEMENT OF COMPANIES AND MEETINGS: Director: Qualification - Disqualification - Position - Appointment - Removal – Duties and Liabilities – Loans – Remuneration – Managing Director – Corporate Social Responsibility – Corporate Governance. Meeting: Meaning – Requisites - Notice – Proxy - Agenda – Quorum – Resolutions – Minutes – Kinds – Shareholder Meetings - Statutory Meeting - Annual General Body Meeting – Extraordinary General Body Meeting – Board Meetings.

UNIT–V: WINDING UP: Meaning – Modes of Winding Up –Winding Up by tribunal – Voluntary Winding Up – Compulsory Winding Up – Consequences of Winding Up – Removal of name of the company from Registrar of Companies – Insolvency and Bankruptcy code - 2016.

SUGGESTED READINGS: 1) Company Law: ND Kapoor, Sultan Chand and Co.

2) Company Law: Rajashree. – HPH

3) Business Law - Kavitha Krishna, Himalaya Publishing House

4) Business Laws – Dr. B. K. Hussain, Nagalakshmi – PBP

5) Company Law: Prof. G. Krishna Murthy, G. Kavitha, PBP

6) Company Law and Practice: GK Kapoor& Sanjay Dhamija, Taxmann Publication.

7) Company Law: Revised as per Companies Act- 2013: KC Garg et al, Kalyani Publication.

8) Corporate Law: PPS Gogna, S Chand.

9) Business Law: D.S. Vital, S Chand 10) Company Law: Bagrial AK, Vikas Publishing House.

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – III

ADVANCED ACCOUNTING

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM301

COURSE OUTCOMES

After completion of the course the student is able to:

1. Prepare financial accounts for partnership firms in different situations .
2. Prepare financial statements for partnership firm on dissolution of the firm.
3. Apply the New Companies Act provisions regarding Company accounts.
4. Evaluate the different ways for a company to raise finances from public .
5. Understand Profits prior to incorporation of a Company.
6. Understand the need and methods of valuation of shares and goodwill.

Objective: To acquire accounting knowledge of partnership firms and joint stock companies

UNIT-I: PARTNERSHIP ACCOUNTS-I: Meaning – Partnership Deed - Capital Accounts (Fixed and Fluctuating) – Admission of a Partner – Retirement and Death of a Partner (Excluding Joint Life Policy)(Including problems)

UNIT-II: PARTNERSHIP ACCOUNTS–II: Dissolution of Partnership – Insolvency of a Partner (excluding Insolvency of all partners) – Sale to a Company (Including problems)

UNIT-III: ISSUE OF SHARES, DEBENTURES, UNDERWRITING AND BONUS SHARES: Issue of Shares at par, premium and discount – Pro-rata allotment – Forfeiture and Re-issue of Shares – Issue of Debentures with Conditions of Redemption – Underwriting: Meaning – Conditions- Bonus Shares: Meaning – SEBI Guidelines for Issue of Bonus Shares – Accounting of Bonus Shares(Including problems)

UNIT-IV: COMPANY FINAL ACCOUNTS AND PROFIT PRIOR TO INCORPORATION: Companies Act 2013: Structure – General Instructions for preparation of Balance Sheet and Statement of Profit and Loss – Part-I: Form of Balance Sheet – Part-II: Statement of Profit and Loss – Preparation of Final Accounts of Companies - Profits Prior to Incorporation- Accounting treatment. (Including problems)

UNIT-V: VALUATION OF GOODWILL AND SHARES: Valuation of Goodwill: Need – Methods: Average Profits, Super Profits and Capitalization Methods -Valuation of Shares: Need –Net Assets, Yield and Fair Value Methods. (Including problems)

SUGGESTED READINGS: 1. Principles and Practice of Accounting: R.L. Gupta & V.K. Gupta,Sultan Chand & Sons. 2. Advanced Accountancy: Shukla and Grewal, S.Chand& Co. 3. Advanced Accountancy: R.L.Gupta&Radhaswamy, Sultan Chand & Sons. 4. Advanced Accountancy (Vol-II): S.N.Maheshwari&V.L.Maheswari, Vikas. 5. Advanced Accountancy: Dr. G. Yogeshwaran, Julia Allen - PBP 6. Accountancy–III: Tulasian, Tata McGraw Hill Co. 7. Advanced Accountancy: Arulanandam; Himalaya. 8. Accountancy–III: S.P. Jain & K.L Narang, Kalyani Publishers. 9. Guidance Note on the Revised Schedule VI to the Companies Act, 1956, The Institute of Chartered Accounts of India. 10. Advanced Accounting (IPCC): D. G. Sharma. Tax Mann Publications.

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – III

BUSINESS STATISTICS –I

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM302

COURSE OUTCOMES

After completion of the course the student is able to:

1. Express the fundamentals of Statistics.
2. Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data.
3. Calculate measures of central tendency, dispersion and asymmetry
4. Interpret the meaning of the calculated statistical indicators.
5. Choose a statistical method for solving practical problems.
6. Predict values of strategic variables using regression and correlation analysis.

Objective: to inculcate analytical and computational ability among the students.

UNIT-I: INTRODUCTION: Origin and Development of Statistics – Definition - Importance and Scope - Limitations of Statistics - Distrust of Statistics. Statistical Investigation: Planning of statistical investigation - Census and Sampling methods - Collection of primary and secondary data - Statistical errors and approximation - classification and Tabulation of data - Frequency distribution.

UNIT – II: DIAGRAMMATIC AND GRAPHIC PRESENTATION: Diagrammatic presentation: One Dimensional and Two Dimensional Diagrams – Pictograms – Cartograms Graphic presentation: Technique of Construction of Graphs - Graphs of Frequency Distribution - Graphs of Time Series or Histograms.

UNIT-III: MEASURES OF CENTRAL TENDENCY: Introduction –Significance -Arithmetic Mean- Geometric Mean - Harmonic Mean - Mode – Median - Quartiles and Percentiles - Simple and Weighted Averages - Uses and Limitations of different Averages.

UNIT-IV: MEASURES OF DISPERSION, SKEWNESS AND KURTOSIS: Measures of Dispersion: Significance - Characteristics - Absolute and Relative Measures - Range - Quartile Deviation - Mean Deviation- Standard Deviation - Coefficient of Variation. Measures of Skewness - Karl Pearson's Coefficient of Skewness - Bowley's Coefficient of Skewness - Kelly's Measure of Skewness – Kurtosis: Mesokurtosis, Platy kurtosis and Leptokurtosis.

UNIT-V: CORRELATION: Meaning -Types - Correlation and Causation – Methods: Scatter Diagram - Karl Person's Coefficient of Correlation - Probable Error and Interpretation of Coefficient of Correlation - Rank Correlation - Concurrent Deviation Method.

SUGGESTED READINGS: 1. Statistics for Management: Levin & Rubin, Pearson 2. Fundamentals of Statistics: Gupta S.C, Himalaya 3. Statistics: E. Narayanan Nadar, PHI Learning 4. Business Statstics –I: Dr. Obul Reddy, Dr. D. Shridevi - PBP 5. Business Statistics: Dr. J. K. Thukral, Taxmann Publications 6. Business Statistics: K. Alagar, Tata McGraw Hill 7. Fundamentals of Statistical: S. P Gupta, Sultan Chand 8. Business Statistics: J. K. Sharma, Vikas Publishers.

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – IV

INCOME TAX

Applicable from the academic year 2018-19onwards

MAX MARKS : 60 E+40I=100 **HPW : 5 NO. Of Credits: 5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire the complete knowledge of basic concepts of income tax
2. Illustrate the concept of exempted incomes.
3. Calculate Residential status of a person.
4. Compute the income under the head" Income from Salary"
5. Compute income under the head "Income from House Property"
6. Compute income under the head "Income from Business or Profession"
7. Apply the conceptual and legal knowledge about Income Tax provisions .
8. Computation of Income from different heads with reference to an Individual Assessee. 9. Identify intra and inter head set of losses and carry forward of losses.
10. Understand clubbing of income and the term aggregation of income.
11. Identify various deductions under section u/s80 C to 80 U 6. Assessing income, calculate tax liability and file E returns.

Objective: To acquire conceptual and legal knowledge about Income Tax provisions relating to computation of Income from different heads with reference to an Individual Assessee.

UNIT–I: INTRODUCTION: Direct and Indirect Taxes – Canons of Taxation - Features and History of Income Tax in India – Definitions and Basic Concepts of Income Tax: Assessee – Deemed Assessee – Assessee-in-default – Assessment Year – Previous Year - Person – Agricultural Income – Heads of Income – Gross Total Income – Total Income — Incomes Exempt from Tax. Residential Status and Scope of Total Income: Meaning of Residential Status – Conditions applicable to an Individual Assessee – Incidence of Tax – Types of Incomes. (Theory only)

UNIT–II: INCOME FROM SALARIES: Definition of 'Salary' – Characteristics of Salary – Computation of Salary Income: Salary u/s 17(1) – Annual Accretion – Allowances – Perquisites – Profits in lieu of Salary – Deductions u/s. 16 – Problems on computation of Income from Salary.

UNIT–III: INCOME FROM HOUSE PROPERTY: Definition of 'House Property' – Exempted House Property incomes– Annual Value – Determination of Annual Value for Let-out House and Self-occupied House – Deductions u/s.24 – Problems on computation of Income from House Property.

UNIT–IV: PROFITS AND GAINS OF BUSINESS OR PROFESSION: Definition of 'Business and Profession' – Procedure for computation of Income from Business – Revenue and Capital nature of Incomes and Expenses – Allowable Expenses u/s. 30 to 37 – Expenses expressly disallowed – Deemed Profits – Miscellaneous provisions u/s 44. Depreciation: Meaning – Conditions for charge of depreciation – Problems on computation of Income from Business.Income from Profession: Rules– procedure – problems on computation of Income from Profession. **UNIT-V: CAPITAL GAINS AND INCOME FROM OTHER SOURCES:** Introduction - Meaning – Scope of charge – Basis of charge – Short term and Long term Capital Assets – Transfer of Capital Asset – Deemed Transfer –Determination of Cost of Acquisition – Procedure for computation of Long-term and Short-term Capital Gains/Losses – Exemptions in respect of certain Capital Gains u/s. 54 – Problems on computation of capital gains - General Incomes u/s. 56(1) – Specific Incomes u/s. 56(2) – Dividends u/s. 2(22) – Winnings from lotteries Puzzles, crown world puzzles, Races – Interest on Securities – Gifts received by an Individual – Casual Income – Family Pension – Rent received on let out of Furniture- Plant and Machinery with/without Building – Deductions u/s. 57. (Theory only) **SUGGESTED READINGS:** 1. Income Tax Law and Practice: V.P. Gaur & D.B Narang, Kalyani Publishers. 2. Taxation: Dr. M.N. Ravi, PBP. 3. Direct Taxes Law & Practice: Dr.Vinod K. Singhania&Dr.KapilSinghania, Taxmann 4. Income Tax: B.B. Lal, Pearson Education. 5. Taxation: R.G. Saha, Himalaya Publishing House Pvt. Ltd. 6. Income Tax: Johar, McGrawHill Education. 7. Taxation Law and Practice: Balachandran&Thothadri, PHI Learning. 8. Direct Tax Law and Practice : AhujaGirish

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – IV

BUSINESS STATISTICS – II

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE CODE : BCOM401

COURSE OUTCOMES

After completion of the course the student is able to:

1. Describe the various techniques of Advanced Statistics in the field of commerce.
2. Select appropriate statistical techniques for summarizing and displaying business data. 3. Analyze and draw inferences from business data using appropriate statistical methods. 4. Interpret and communicate the results of a statistical analysis in the context of a business problem. 5. Understand and use simple forecasting techniques.
6. Understand the concept of Index Numbers , Probability and theoretical distribution.

Objective: To inculcate analytical and computational ability among the students.

UNIT-I: REGRESSION: Introduction - Linear and Non Linear Regression – Correlation Vs. Regression - Lines of Regression - Derivation of Line of Regression of Y on X - Line of Regression of X on Y - Using Regression Lines for Prediction.

UNIT-II: INDEX NUMBERS: Introduction - Uses - Types - Problems in the Construction of Index Numbers - Methods of Constructing Index Numbers - Simple and Weighted Index Number (Laspeyre - Paasche, Marshall – Edgeworth) - Tests of Consistency of Index Number: Unit Test - Time Reversal Test - Factor Reversal Test - Circular Test - Base Shifting - Splicing and Deflating of Index Numbers.

UNIT-III: TIME SERIES: Introduction - Components – Methods-Semi Averages - Moving Averages – Least Square Method - Deseasonalisation of Data – Uses and Limitations of Time Series.

UNIT-IV: PROBABILITY: Probability – Meaning - Experiment – Event - Mutually Exclusive Events - Collectively Exhaustive Events - Independent Events - Simple and Compound Events - Basics of Set Theory – Permutation – Combination - Approaches to Probability: Classical – Empirical – Subjective - Axiomatic - Theorems of Probability: Addition – Multiplication - Baye's Theorem.

UNIT-V: THEORITECAL DISTRIBUTIONS: Binomial Distribution: Importance – Conditions – Constants - Fitting of Binomial Distribution. Poisson Distribution: – Importance – Conditions – Constants - Fitting of Poisson Distribution. Normal Distribution: – Importance - Central Limit Theorem - Characteristics – Fitting a Normal Distribution (Areas Method Only).

SUGGESTED READINGS: 1. Statistics for Management: Levin & Rubin, Pearson, 2. Fundamentals of Statistics: Gupta S.C, Himalaya 3. Business Statistics: Theory & Application, P. N. Jani, PHI Learning 4. Business Statics – II: Dr. OBul Reddy, Dr. D. Shridevi - PBP 5. Business Statistics: Dr. J. K. Thukral, Taxmann Publications 6. Business Statistics: K. Alagar, Tata McGraw Hill 7. Fundamentals of Statistical: S. P Gupta , Sultan Chand 8. Business Statistics: J. K. Sharma,Vikas Publishers 9. Business Statistics: Vora, Tata McGraw Hill 10. Statistics-Problems and Solutions: Kapoor V.K, S. Chand 11. Statistics-Teory, Methods and Applications: SanchetiD.C. &Kapoor V.K 12. Business Statistics: S. K. Chakravarty, New Age International Publishers 13. Business Statistics-G.Laxman,Vasudeva Reddy, K.Goud, TaxmannPublications,Hyderabad.

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES &

PRACTICE)CBCS SEMESTER – V

COST ACCOUNTING

Applicable from the academic year 2018-19onwards

MAX MARKS : 60 E+40I=100 **HPW :5 NO. Of Credits:5**

COURSE CODE : BCOM501

COURSE OUTCOMES

After completion of the course the student is able to:

1. Imbibe conceptual knowledge of cost accounting.
2. Select the costs according to their impact on business.
3. Differentiate methods of schedule costs per unit of production and calculating stock consumption. 4. Identify the specifics of different costing methods and interpret the impact of the selected costs method. 5. Apply cost accounting methods to evaluate and project business performance.
6. Demonstrate mastery of costing systems, cost management systems, budgeting systems and performance measurement system.

Objective: To make the students acquire the knowledge of cost accounting methods.

UNIT-I: INTRODUCTION: Cost Accounting: Definition – Features – Objectives – Functions – Scope – Advantages and Limitations - Essentials of a good cost accounting system- Difference between Cost Accounting and Financial Accounting – Cost concepts – Cost Classification.

UNIT-II: MATERIAL: Direct and Indirect Material cost – Inventory Control Techniques – Stock Levels – EOQ – ABC Analysis – JIT - VED - FSND - Issue of Materials to Production – Pricing methods: FIFO - LIFO with Base Stock and Simple and Weighted Average methods.

UNIT-III: LABOUR AND OVERHEADS: Labour: Direct and Indirect Labour Cost – Methods of Payment of Wages (only Incentive Plans): Halsey, Rowan, Taylor Piece Rate and Merrick Multiple Piece Rate Methods. Overheads: Classification - Methods of Allocation - Apportionment and Absorption of overheads.

UNIT-IV: UNIT AND JOB COSTING: Unit Costing: Features - Cost Sheet – Tender and Estimated Cost Sheet. Job Costing: Features - Objectives – Procedure - Preparation of Job Cost Sheet.

UNIT-V: CONTRACT AND PROCESS COSTING: Contract Costing: Features – Advantages - Procedure of Contract Costing – Guidelines to Assess profit on incomplete Contracts. Process Costing: Meaning – Features – Preparation of Process Account – Normal and Abnormal Losses.

SUGGESTED READINGS: 1. Cost Accounting: Jain and Narang, Kalyani 2. Cost Accounting: Srihari Krishna Rao, Himalaya 3. Cost and Management Accounting: PrashantaAthma, Himalaya 4. Cost Accounting: Dr. G. Yogeshweran, PBP. 4. Cost Accounting: Jawaharlal, Tata Mcgraw Hill 5. Cost Accounting: Theory and Practice: Banerjee, PHI 6. Introduction to Cost Accounting: Tulsian, S.Chand 7. Cost Accounting: Horngren, Pearson 8. Cost Accounting: Ravi M. Kishore, Tax Mann Publications.

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – V

COMPUTERIZED ACCOUNTING

Applicable from the academic year 2018-19 onwards

MAX MARKS : 50 E+35P+15I=100 **PPW :3T+4P NO. Of Credits:5**

COURSE CODE : BCOM502

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire the knowledge of computer software.
2. Understand the limitations of manual accounting and advantages of computerized accounting.
3. Integrate technical skills with financial accounting procedures.
4. Explain the process of maintaining inventory and day-to-day transactions in Tally accounting software. 5. Manage account receivables and payables in ERP.
6. Able to generate MIS reports.

Objective: To make the students to acquire the knowledge of computer software

UNIT I: MAINTAINING CHART OF ACCOUNTS IN ERP: Introduction-Getting Started with ERP - Mouse/Keyboard Conventions-Company Creation-Shut a Company-Select a Company-Alter Company Details-Company Features and ConfigurationsF11: Company Features-F12: Configuration-Chart of Accounts-Ledger-Group-Ledger CreationSingle Ledger Creation-Multi Ledger Creation-Altering and Displaying Ledgers-Group Creation-Single Group Creation Multiple Group Creation-Displaying Groups and LedgersDisplaying Groups-Display of Ledgers-Deletion of Groups and Ledgers – P2P procure to page.

UNIT II: MAINTAINING STOCK KEEPING UNITS (SKU): Introduction-Inventory Masters in ERP - Creating Inventory Masters-Creation of Stock GroupCreation of Units of Measure-Creation of Stock Item-Creation of Godown-Defining of Stock Opening Balance in ERP Stock Category-Reports. **UNIT III: RECORDING DAY-TO-DAY TRANSACTIONS IN ERP:** Introduction-Business Transactions-Source Document for Voucher-Recording Transactions in ERP - Accounting Vouchers-Receipt Voucher (F6)-Contra Voucher (F4)- Payment Voucher (F5)-Purchase Voucher (F9)-Sales Voucher (F8)-Debit Note Voucher-Credit Note (Ctrl+F8)- Journal Voucher (F7).

UNIT IV: ACCOUNTS RECEIVABLE AND PAYABLE MANAGEMENT: Introduction-Accounts Payables and Receivables Maintaining Bill-wise Details-Activation of Maintain Bill-wise Details Feature-New Reference-Against Reference Advance-On AccountStock Category Report-Changing the Financial Year in ERP.

UNIT V: MIS REPORTS: Introduction-Advantages of Management Information Systems-MIS Reports in ERP - Trial Balance - Balance Sheet-Profit and Loss Account-Cash Flow Statement-Ratio Analysis-Books and Reports - Day Book-Receipts and Payments-Purchase Register-Sales Register-Bills Receivable and Bills Payable. **SUGGESTED READINGS:** 1. Computerised Accounting: GarimaAgarwal, Himalaya 2. Computerised Accounting: A. Murali Krishna, Vaagdevi publications 3. Computerised Accounting: Dr. G. Yogeshweran, PBP. 4. Aakash Business Tools: Spoken Tutorial Project IIT Bombay 5. Mastering Tally: Dinesh Maidasani, Firewal Media 6. Implementing Tally ERP 9: A.K Nadhani and K.K Nadhani, BPB Publications 7. Computerised Accounting and Business Systems: Kalyani Publications 8. Manuals of Respective Accounting Packages 9. Tally ERP 9: J.S. Arora, Kalyani Publications.

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – VI

COST CONTROL AND MANAGEMENT ACCOUNTING

Applicable from the academic year 2018-19 onwards

MAX MARKS : 60 E+40I=100 **PPW : 5 NO. Of Credits: 5**

COURSE CODE : BCOM601

COURSE OUTCOMES

After completion of the course the student is able to:

1. Understand various costing systems and management systems.
2. Analyse and provide recommendations to improve the operations of organisations through the application of Cost and Management accounting techniques.
3. Evaluate the costs and benefits of different conventional and contemporary costing systems.
4. Differentiate methods of schedule costs as per unit of production.
5. • Differentiate methods of calculating stock consumption.
6. Identify the specifics of different costing methods.
7. Analyze cost-volume-profit techniques to determine optimal managerial decisions.
8. Apply cost accounting methods for both manufacturing and service industry.

Objective: Tobe acquaint with Cost Control techniques, Managerial Accounting decision-making techniques and reporting methods.

UNIT-I: INTRODUCTION TO MANAGEMENT ACCOUNTING &MARGINAL COSTING: Meaning and Importance of Management Accounting – Marginal Cost Equation – Difference between Marginal Costing and Absorption Costing – Application of Marginal Costing – CVP Analysis – Break Even Analysis: Meaning – Assumptions – Importance - Limitations. Marginal Costing for Decision Making-Make or Buy – Add or Drop Products – Sell or Process Further – Operate or Shut-down – Special Order Pricing – Replace or Retain.

UNIT-II: BUDGETARY CONTROL AND STANDARD COSTING: Budget: Meaning – Objectives – Advantages and Limitations – Essentials of Budgets - Budgetary Control - Classification of Budgets - Preparation of Fixed and Flexible Budgets. Standard Costing: Meaning – Importance – Standard Costing and Historical Costing - Steps involved in Standard Costing. Variance Analysis: Material variance - Labour variance - Overhead variance .

UNIT-III: TECHNIQUES OF FINANICAL STATEMENT ANALYSIS: Meaning – Objectives - Techniques: Comparative Statement, Common Size Statement, Trend Analysis. Ratios- Meaning , Objectives and Classification—Computation of Activity, Liquidity, Solvency and Profitability Ratios.

UNIT-IV: FUNDS FLOW ANANLYSIS: Concept of Funds – Meaning and Importance – Limitations – Statement of Changes in Working Capital – Statement of Sources and Application of Funds.

UNIT-V: CASH FLOW ANALYSIS (AS-3): Meaning – Importance – Differences between Funds Flow and Cash Flow Statements – Procedure for preparation of Cash Flow Statement.

SUGGESTED READINGS: 1. Management Accounting- Principles & Practice: Sharma RK &Shashi K. Gupta, Kalyani 2. Advanced Managerial Accounting: Srihari Krishna Rao, Himalaya 3. Advanced Managerial Accounting: Dr. Sundaram, PBP 3. Advanced Management Accounting: Robert S. Kaplan & Anthony A. Atkinson, Prentice-Hall 4. Management Accounting: Rustagi R.P, Galgotia 5. Managerial Accounting: Ronald W. Hilton, TM

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS SEMESTER – VI

THEORY AND PRACTICE OF GST

Applicable from the academic year 2018-19 onwards

MAX MARKS : 50 E+35P+15I=100 **PPW :3T+4P NO. Of Credits:5**

COURSE CODE : BCOM602

COURSE OUTCOMES

After completion of the course the student is able to:

1 . Know the various provisions of GST Act 2017.
2. Practice various provisions of GST in Tally ERP 9.1.
3. Learn and compare various tax rates for goods and services under GST .
4. Practice the advance entries and adjustments relating to various transactions.
5. Generate the various reports and upload in the GST portal .

Objective: To equip the students with the knowledge regarding Theory and Practice of GST.

UNIT I: INTRODUCTION TO GST: Introduction – GST - Taxes Subsumed under GST -Determination of Tax - Registration -Process of Registration - Cancellation and renovation of registration - Supply of Goods and Services - Transition to GST - Registered Business -Availed Input Tax Credit -Unavailed CENVAT credit and Input VAT on capital goods-Availing the input credit held in closing stock -Invoicing -Tax Invoice -Bill of Supply - Credit Note, Debit Note and Supplementary Invoice-Transportation of goods without issue of Invoice - Input Credit Mechanism - Input Tax - GST Returns - Payment of Tax.

UNIT II: GETTING STARTED WITH GST: Introduction - Enabling GST and Defining Tax Details-Transferring Input Tax credit to GST -Intrastate Supply of Goods-Intrastate Inward Supply -Intrastate Outward Supply -Interstate - Interstate Outward Supply - Return of Goods -Purchase Returns -Sales Returns -Supplies Inclusive of Tax -Defining Tax Rates at Master and Transaction Levels - Defining GST Rates at Stock Group Level-Defining GST Rate at Transaction Level -Hierarchy of Applying Tax Rate Details –Reports.

UNIT III: RECORDING ADVANCED ENTRIES, GST ADJUSTMENT AND RETURN FILING: Introduction -Accounting of GST Transactions -Purchases from Composition Dealer -Purchases from Unregistered Dealers-Exports -Imports - Exempted Goods -SEZ Sales -Advance Receipts and payments - Mixed Supply and Composite Supply under GST - Mixed Supply of Goods -Composite Supply of Goods -GST Reports - Generating GSTR- Report in ERP -Input Tax Credit Set Off -GST Tax Payment -Time line for payment of GST tax -Modes of Payment -Challan Reconciliation - Exporting GSTR- return and uploading in GST portal. **UNIT IV: GETTING STARTED WITH GST (SERVICES):** Introduction -Determination of supply of services -Determining the Place of Supply of Services -Enabling GST and Defining Tax Details-Transferring Input Tax credit to GST -Intrastate Supply of Goods - Intrastate Inward Supply Intrastate Outward Supply -Interstate Supply -Interstate Outward Supply - Interstate Inward Supply -Interstate Outward Supply of Services -Cancellation of Services -Cancellation of Inward Supplies -Cancellation of Outward Supply of Services -Defining Tax Rates at Master and Transaction Levels.

UNIT V: RECORDING ADVANCED ENTRIES AND MIGRATION TO ERP: Introduction - Accounting Multiple Services in a Single Supply - Recording Partial Payment to Suppliers -Outward Supplies - Recording Outward Supply with Additional Expenses - Supply of services -Business to consumers - Time of Supply of Services - Place of Supply of Services - Determining place of supply of services - Exempt Supply of Services under GST -Export Supply of Services - Reverse Charge on Services under GST - Advance Receipts from Customers under GST - Advance Receipt and issuing Invoice on same month -Advance Receipt and issuing Invoice on different month - Reversal of GST on account of cancellation of advance receipt - Generating GSTR- Report in ERP - Input Tax Credit Set Off - Migration to ERP - Activate Goods and Services Tax (GST) in ERP - Set up GST rates - Update Masters - Update party GSTIN/UIN - Creation of GST Duty ledgers.

SUGGESTED READINGS: 1. Taxmann's Basics of GST 2. Taxmann's GST: A practical Approach 3. Theory & Practice of

Structure and Organisational Culture.

Organisational Design—Basic Challenges; Differentiation and Intergration Process; Centralization and Decentralization Process; Standardization/Formalization and Mutual Adjustment. Coordinating Formal and Informal Organizations. Mechanistic and Organic Structures.

Designing Organizational structures—Authority and Control; Line and Staff Functions, Specialization and Coordination. Types of Organization Structure—Functional. Matrix Structure, Project Structure. Nature and Basis of Power, Sources of Power, Power Structure and Politics. Impact of Information Technology on Organizational Design and Structure.

Managing Organizational Culture.

2. **Organisation Behaviour :**

Meaning and Concept; Individual in organization: Personality, Theories, and Determinants; Pereception Meaning and Process.

Motivation : Concepts, Theories and Applications. Leadership—Theories and Styles. Quality of Work Life (QWL): Meaning and its impact on Performance, Ways of its Enhancement. Quality Circles (QC)—Meaning and their Importance. Management of Conflicts in Organizations. Transactional Analysis, Organizational Effectiveness, Management of Change.

Human Resources Management and Industrial Relations

1. **Human Resources Management (HRM) :**

Meaning Nature and Scope of HRM, Human Resource Planning, Job Analysis, Job Description, Job Specification, Recruitment Process, Selection Process, Orientational and Placement, Training and Development Process, Performance Appraisal and 360° Feed Back, Salary and Wage Administration, Job Evaluation, Employee Welfare, Promotions, Transfers and Separations.

2. **Industrial Relations (IR) :**

Meaning, Nature, Importance and Scope of IR, Formation of Trade Union, Trade Union Legislation, Trade Union Movement in India. Recognition of Trade Unions, Problems of Trade Unions in India. Impact of Liberalization on Trade Union Movement.

Nature of Industrial Disputes: Strikes and Lockouts, Causes of Disputes, Prevention and Settlement of Disputes.

Worker's Participation in Management: Philosophy, Rationale, Present Day Status and Future Prospects.

Adjudication and Collective Bargaining.

Industrial Relations in Public Enterprises Absenteeism and Labour Turnover in Indian Industries and their Causes and Remedies.

ILO and its Functions.

ECONOMICS

PAPER—I

1. **Advanced Micro Economics :**

(a) Marshallian and Walrasian Approaches to Price determination.

(b) Alternative Distribution Theories : Ricardo, Kaldor, Kalecki.

(c) Markets Structure : Monopolistic Competition, Duopoly, Oligopoly.

(d) Modern Welfare Criteria : Pareto Hicks and Scitovsky, Arrow's Impossibility Theorem, A. K. Sen's Social Welfare Function.

2. Advance Macro Economics :

Approaches to Employment Income and Interest Rate determination : Classical, Keynes (IS-LM) curve, Neo-classical synthesis and New classical, Theories of Interest Rate determination and Interest Rate Structure.

3. Money-Banking and Finance :

(a) Demand for and Supply of Money : Money Multiplier Quantity Theory of Money (Fisher, Pigou and Friedman) and Keynes' Theory on Demand for Money, Goals and Instruments of Monetary Management in Closed and Open Economies. Relation between the Central Bank and the Treasury. Proposal for ceiling on growth rate of money.

(b) Public Finance and its Role in market Economy : In stabilization of supply, allocation of resources and in distribution and development. Sources of Government revenue, forms of Taxes and Subsidies, their incidence and effects. Limits to taxation, loans, crowding-out effects and limits to borrowings. Public expenditure and its effects.

4. International Economics :

(a) Old and New theories of International Trade.

(i) Comparative advantage,

(ii) Terms of Trade and Offer Curve.

(iii) Product Cycle and Strategic Trade Theories.

(iv) Trade as an engine of growth and theories of underdevelopment in an open economy.

(b) Forms of Protection : Tariff and quota.

(c) Balance of Payments Adjustments : Alternative Approaches.

(i) Price versus income, income adjustments under fixed exchange rates.

(ii) Theories of Policy Mix.

(iii) Exchange rate adjustments under capital mobility.

(iv) Floating Rates and their Implications for Developing COUNTRIES: Currency Boards.

(v) Trade Policy and Developing Countries.

(vi) BOP, adjustments and Policy Coordination in open economy macro-model.

(vii) Speculative attacks.

(viii) Trade Blocks and Monetary Unions.

(ix) WTO : TRIMS, TRIPS, Domestic Measures, Different Rounds of WTO talks.

5. Growth and Development:

(a) (i) Theories of growth : Harrod's model;

(ii) Lewis model of development with surplus labour.

(iii) Balanced Unbalanced Growth.

(iv) Human Capitals and Economic Growth.

(v) Research and Development and Economic Growth.

(b) Process of Economic Development of less developed countries: Myrdal and Kuznets on economic development and structural change: Role of Agriculture in Economic Development of less developed countries.

(c) Economic Development and International Trade and Investment, Role of Multinationals.

(d) Planning and Economic Development: changing role of Markets and Planning, Private-Public

Partnership.

(e) Welfare indicators and measures of growth—Human Development Indices. The basic needs approach.

(f) Development and Environmental Sustainability—Renewable and Non Renewable Resources, Environmental Degradation, Intergenerational equity development.

PAPER-II

Indian Economy in Pre-Independence Era :

Land System and its changes, Commercialization of agriculture Drain theory, Laissez faire theory and critique. Manufacture and Transport: Jute, Cotton, Railways, Money and Credit.

Indian Economy after Independence :

A. The Pre-Liberalization Era :

(i) Contribution of Vakil, Gadgil and V.K.R.V. Rao.

(ii) Agriculture: Land Reforms and land tenure system, Green Revolution and capital formation in agriculture.

(iii) Industry Trends in composition and growth, Role of public and private sector, Small scale and cottage industries.

(iv) National and Per capita income : patterns, trends, aggregate and Sectoral composition and changes therein.

(v) Broad factors determining National Income and distribution, Measures of poverty, Trends in poverty and inequality.

B. The Post Liberalization Era :

(i) New Economic Reform and Agriculture: Agriculture and WTO, Food processing, subsidies, Agricultural prices and public distribution system, Impact of public expenditure on agricultural growth.

(ii) New Economic Policy and Industry: Strategy of industrialization, Privatization, Disinvestments, Role of foreign direct investment and multinationals.

(iii) New Economic Policy and Trade: Intellectual property rights : Implications of TRIPS, TRIMS, GATS and new EXIM policy.

(iv) New Exchange Rate Regime: Partial and full convertibility, Capital account convertibility.

(v) New Economic Policy and Public Finance : Fiscal Responsibility Act, Twelfth Finance Commission and Fiscal Federalism and Fiscal Consolidation.

(vi) New Economic Policy and Monetary system. Role of RBI under the new regime.

(vii) Planning: From central Planning to indicative planning, Relation between planning and markets for growth and decentralized planning: 73rd and 74th Constitutional amendments.

(viii) New Economic Policy and Employment: Employment and poverty, Rural wages, Employment Generation, Poverty alleviation schemes, New Rural, Employment Guarantee Scheme.

ELECTRICAL ENGINEERING

PAPER-I

1. Circuits—Theory :

Circuit components; network graphs; KCL, KVL; Circuit analysis methods : nodal analysis, mesh

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019)
SEMESTER-V, DEVELOPMENT ECONOMICS, Discipline Specific Course – Paper –V

Course Title: Development Economics
Nature of Course: Core **Total Hours: 90**
Number of Credits: 5

Module – I : Economic Development and Growth

Concepts of Economic Growth and Development Measurement of Economic Development: Per Capita Income, Basic Needs, Physical Quality of Life Index, Human Development Index and Gender Empowerment Measure.

Module – II : Factors in Economic Development

Factors Effecting Economic Development – Characteristics of Developing Countries – Population and Economic Development – Theories of Development Transition. Human Resource Development and Economic Development.

Module – III : Theories of Economic Development

Adam Smith Theory , David Ricardo Theory, Karl Marx Theory and Schumpeter Theory .

Module – IV : Theories of Under Development

Rodan'sBigpush Theory and Lewis Theory of Abundant Labour Supplies.

Module – V : Theories of Balanced and Unbalanced Growth

Concepts of Balanced and Unbalanced Growth.RagnerNurske's Balanced Growth Strategy, Hirschman's Unbalanced Growth Strategy Leibenstein's Critical Minimum effort Theory.

References:

- Mier, Gerald, M : Leading issues in Economic Development, OUP, Delhi
- Todaro, Micheal P : Economic Development in the Third World Orient Longman, Hyderabad
- GhatakSubrata : Introduction to Development Economics
- SukumoyChakravarthy : Development Planning – Indian Experience, OUP, Delhi
- Misra&Puri : Economic Development and Planning, Theory and Practice

13. a
(or)
b

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019)
SEMESTER-V, INDIAN ECONOMY, Discipline Specific Elective - Paper - IA

Course Title: Indian Economy
Nature of Course: Elective **Total Hours: 90**
Number of Credits: 5

Module – I : Structure of the Indian Economy

Indian Economy at the time of Independence. Changes in the composition of National Income and Employment; Natural Resource Base: Land, Water, Forest, Mineral and Metal Resources; Sustainable Development.

Module – II : Indian Agriculture

Importance and Role of Agriculture.Trends in Agricultural Production and Productivity.LandReforms.GreenRevolution.AgriculturalFinance.AgriculturalMarketing.Agricultural Price Policy.Food Security in India.

Module – III : Indian Industry and Service Sector

Structure, Growth and Employment of Industry; Industrial PolicyResolutions : 1948, 1956, 1991;Growth and Problems of Small Scale Industries; Service Sector- Growing and Importance of Service Sector in India (Education, Health).

Module – IV : Planning in India

Meaning & Definition- Need of Planning – Types of Planning. Five – Year Plans: Objectives, Strategies, Resource Allocation; Evaluation and Performance of The Indian Economy Under Planning; NITI Ayog

Module – V : Economic Reforms and Globalisation

New Economic Reforms: Liberalisation, Globalisation, Privatisation and their Implications in India.

References :

- SK Misra and Puri : Indian Economy, Himalaya Publishing House
- Ishwar C Dhigra : The Indian Economy: Environment and Policy,

12. a
(or)
b

13 (a)
or
b

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019SEMESTER-V, FINANCIAL ECONOMICS, Discipline Specific Elective – Paper – IB

Course Title: Financial Economics
Nature of Course: Elective **Total Hours: 90**
Number of Credits: 5

Module – I : The Financial System

The financial system and its Significance for Economic Development - The Structure of the Financial System in India –Functions of Finance, Finance Planning, All India Development Financial Institutions, Investment Institutions, Specialized Financial Institutions and State Level Financial Institutions.

Module – II : Commercial Banking

Banking Structure in India – Role of Commercial Banks, Context, Need and Objectives-Financial Sector Reforms – NarasimhamCommittee Report-I – Financial Sector Reforms with Reference to Stock Markets.

Module – III : Money Market

Organized Sector of the Money Market and their Sub-Markets- Call Money Market, Treasury Bill Market, The Repo Market, Commercial Paper Market and Money Market Mutual Funds and their Instruments- Money Market Reforms in India.

Module – IV : Capital Market

Structure of Capital Market – Primary and Secondary Markets – New Issues and Secondary Issues Markets, Securities – Private and Guilt Edged Securities.

Module-V: Industrial Finance

Structure and Growth of Industrial Financial Institutions.IFCI, IDBI, ICICI and SFCs.

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019)
SEMESTER-VI, INTERNATIONAL ECONOMICS
Discipline Specific Course – Paper –VI

Course Title: International Economics
Nature of Course: Core **Total Hours: 90**
Number of Credits: 5

Module – I : Introduction

International Economics- Meaning and Scope; Inter regional and International Trade, Advantages and Disadvantages of International Trade, Free Trade, Protection Policies.

Module – II : Theories of International Trade

Theories of Absolute Advantage, Comparative Advantage, Haberler's Opportunity Costs and Hecksher-Ohlin Theory of International Trade.

Module – III : Terms of Trade and Tariffs, Quotas

Gains from Trade – Trade as an Engine of Economic Growth. Concepts of Terms of Trade – Factors affecting Terms of Trade,Tariffs,Quotas,Optimum Tariff;

Module – IV :Balance of Payments

Concepts and Components of BOP, Equilibrium and Disequilibria in Balance of Payments, Types of Disequilibria.Remedial Measures to Control Disequilibrium.

Module – IV :Foreign Trade in India

Role of International Monitory Agencies-IMF,IBRD.WTO in India and its impact on Indian Trade; Multi-National Corporation's (MNC's), FERA & FEMA.

References :

- Soderston B (1990) : International Economics, Macmillan Press LTD. London
- Kindle Berger Cp (1973) : International Economics RD Irwin Concepts Wood
- Vaish MC and Sudhama Singh (2000) : International Economics, Himalaya Publishing House, New Delhi
- Salvatore, D L (1997) : International Economics, Prentice Hall NJ
- Mithani DM (2000) : International Economics, Himalaya, Mumbai

b

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019)
SEMESTER-VI, ECONOMICS OF INSURANCE, Discipline Specific Elective-Paper-IIA

Course Title: Economics Insurance
Nature of Course: Elective **Total Hours: 90**
Number of Credits: 5

Module – I : Introduction
Meaning and Types of Insurance: Life Insurance and importance of its Policies. General Insurance- Types of Non- Life Insurance and Marketing of General Insurance- Features of Health Insurance, Fire Insurance. Investments in Insurance – Tax Advantaged and Non-Tax Advantaged Insurance.

Module – II : Essentials of Individual Retirement Planning
Analysis of Retirement; Income Needs; Retirement Planning Strategies; Investing for Retirement, Pension Plans; Basic Principles of Pension Plans; Pension Plans in India. Life Insurance for Estate Liquidity.

Module – III : Role of Risk-Management and Insurance
Insurance Institutions as Financial Intermediaries; Insurance Institutions as Investment Institutions; Insurance in Indian Capital Market.

Module – IV : Regulation of Insurance
Purpose of Government Intervention in Markets; Insurance Regulation in India;

Module – IV : Role of IRDA
Insurance Regulation & Development Authority; Setup and Management of Insurance Companies.Role of IRDA in Growth of Insurance in India.

Basic Reading List ;

- Black. K. Jr. and H.D. Skipper Jr.(2000), Life & Health Insurance, Prentice Hall, Upper Saddle River, New Jerssey.
- Dionne, G. and S.E. Harrington (Eds.) (1997), Foundations of Insurance Economics, Kluwer Academic Punlishers, Boston.
- Pteffer, I. and D.R. Klock (1974), Perspectives on Insurance, Prentice Hall Inc., Engle Word Cliffs.

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. III YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2018-2019)
SEMESTER-VI, INDUSTRIAL ECONOMICS, Discipline Specific Elective-Paper-IIB

Course Title: Industrial Economics
Nature of Course: Elective **Total Hours: 90**
Number of Credits: 4

Module – I : Meaning and Classification of Industries

Use-Based, Resource Based and ASI Two and Three Digit Classification. Industrial Location Theories : Weber, Sargent Florence and Losch – Factors Affecting Industrial Location.

Module – II ; Market Structure and Market Performance

Types of Markets Based on Place, Time and Competition. Concepts and Organization of a Firm.MarketStructure;Sellers Concentration; Product Differentiation; Entry Conditions; Economics of Scale.

Module – III : Industrial Pattern under Five Year Plan

Industrial Economic Concentration and Remedial Measures. Industrial Policy 1991: Role of Public and Private Sector, LPG Program. Recent Trends in Industrial Growth.

Module – IV : Industrial Finance

Industrial Finance: Owned, External and other Components of Funds; Role, Nature, Volume and Types of Institutional Finance – State Level Financial Institutions and Commercial Banks.

Basic Reading List :

- Ahuliwalia, I.J. (1985), Industrial Growth in India, Oxford University Press, New Delhi.
- Barthwal, R.R. (1985), Industrial Economics, Wiley Eastern LTD., New Delhi.
- Chernuliam, F. (1994), Industrial Economics: Indian Perspective (3RD Edition), Himalaya Publishing House, Mumbai.
- Desai, B. (1999), Industrial Economy in India (3^{RD} Edition), Himalaya Publishing House, Mumbai.

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET, HYDERABAD
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. II YEAR, ECONOMICS, CHOICE BASED CREDIT SYSTEM SYLLABUS (2017-2018)
SEMESTER-III, MICRO ECONOMICS – II, Discipline Specific Course – Paper – III

Course Title: Micro Economics-II
Nature of Course: Core **Total Hours: 90**
Number of Credits: 4

Module I: Types of Revenue and Objectives of Firm
21hrs

Behaviour of the Firm. Concept of Revenue: Total Revenue (TR), Average Revenue (AR) and Marginal Revenue (MR). Relationship between AR and MR. Traditional Objectives of the Firm: Profit Maximization. Modern Objectives of the Firm: Output/Sales/Market share Maximization.

Module II: Perfect Competition and Monopoly
17hrs

Classification of Market.Perfect Competition, Short Run and Long Run Analysis.Equilibrium of Firm and Industry.Monopoly Features, Equilibrium.Discriminatory Pricing.Differences between Perfect Competition and Monopoly.

Module III: Monopolistic Competition and Oligopoly
15hrs

Monopolistic Competition. Product Differentiation, Selling costs. Oligopoly: Homogenous and Heterogeneous Oligopoly, Price Rigidity in Oligopoly. Kinky Demand Curve.

Module IV: Pricing Strategies
18hrs

Pricing Practices: Cost Plus Pricing, Marginal Pricing, Rate of Return Pricing, Product Life Pricing, Price Skimming, Penetration Pricing, Mark-up Pricing. State Intervention and Administered Prices.

Module V: Distribution and Factor Pricing
19hrs

Functional and Personal Distribution, Marginal Productivity Theory of Distribution. Ricardo Theory of Rent.QuasiRent.Theories of Wages.Theories of Profit.Risk and Uncertainty.Concept of Interest.

References:

- M L Seth : Micro Economics
- M L Jhingoan : Micro Economics
- H L Ahuja : Modern Micro Economics
- Koutsainies : Modern Micro Economics
- Stonier and Hague : Micro Economics
- Salvatore : Micro Economics
- Schaume series : Micro Economics
- Pyndick : Micro Economics

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)

DEPARMENT OF ECONOMICS

B.A. II YEAR, ECONOMICS, CHOICE BASED CREDIT SYSTEM SYLLABUS (2017-2018)

SEMESTER-IV, PUBLIC ECONOMICS, Discipline Specific Course – Paper – IV

Course Title: Public Economics
Nature of Course: Core **Total Hours: 90**
Number of Credits: 4

Module I: Introduction **15hrs**

Meaning, Scope and Importance of Public Finance; Evolution of public finance; Public and Private finance; Public goods and Private goods; Principle of Maximum Social Advantage.

Module II: Public Expenditure **15hrs**

Meaning - Classification of Public Expenditure, Theories of Public Expenditure (Wagnar's Law and Peacock Wisemans) –Causes of increase in Public Expenditure – Effects of Public Expenditure.

Module III: Taxation and Public Debt **17hrs**

Approaches to taxation - Benefit approach and Ability to pay approach - incidence and shifting of taxation-Types and Classification (Direct and Indirect) and VAT, GST

Public debt- Meaning, Classifications, Causes and Effects of Public Debt.

Module– IV: Public Revenue, Fiscal Policy Federal Finance **23hrs**

Sources of Public Revenue - Taxes, Administrative Revenues, Commercial Revenues, Gifts and Grants, Deficit Finance; Sources of Central, State Revenue in India.

Fiscal Policy –Meaning - objectives of Fiscal Policy in India; Fiscal Policy Vs. Monetary Policy; Fiscal Responsibility.

Federal financial structure and its main features

Module V: Budget **20hrs**

Budget – Classification of budgets- Economic, Functional, Organisational, Classifications of budgets- performance of programming and zero based budgets- surplus, balanced and deficit budget- concepts of budget deficit and their implications- State and Central budgets; Functions of Finance Commission.

References:

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. I YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2019-2020)
SEMESTER-I, MICRO ECONOMICS – I, Discipline Specific Course – Paper – I

Course Title: Micro Economics - I
Nature of Course: Core **Total Hours: 90**
Number of Credits: 5

Module I: Introduction and Consumer Behaviour **19Hrs**

Definitions: Wealth, Welfare, Scarcity and Growth. Scope and Limitations.Importance of Economics.Concept of utility.Cardinal and ordinal utility analysis. Law of Diminishing Marginal Utility, Law of Equi- Marginal Utility.Propertiesof Indifference curves, Concept of budget line, Consumer Equilibrium, Consumer Surplus.Price consumption curve, income consumption curve, derivation of demand curve with the help of ordinal utility analysis.Concept of price, income and substitution effects.

Module II: Production Analysis **17Hrs**

Concepts of Short run and long run production function,properties of iso-product curves, concept of factor price line , analysis of least cost input combination, concept of expansion path and economic region of production, concept of returns scale and types of returns to scale. Linear and homogenous production function, properties of Cobb-Douglas production function.

Module III: Cost and Revenue Analysis **15Hr**

Cost concepts: Accounting, real, opportunity, explicit cost. Total cost , total fixed cost, total variable cost, average cost, average fixed cost, average variable cost, marginal cost and the relationship between average and marginal cost, derivation of long run average cost curve.Economies of scale. Internal and External.
Revenue concepts: total,average and marginal, relationship between average revenue and marginal revenue and price elasticity of demand.

Module IV: Market structure: Imperfect competition **19Hrs**

Monopoly :Equlibrium of a monopolist with price discrimination, degree of price discrimination, welfare loss under monopoly. Monopolistic competition: characteristics, concepts of product differentiation and selling cost, analysis of resources wastage under monopolistic competition. Oligopoly: characteristics of oligopoly, reasons for price rigidity in non –collusive oligopoly. Duopoly: Augustincournot's modern version of duopoly..

Mdule V:Analysis of Business firm , Profit and pricing strategies **21Hrs**

Characteristics of business firm, objectives of business firm: profit maximization, sales revenue maximization, market shares maximization, growth maximization. Profit concepts: accounting and economic, break-even point and profit-volume analysis.

Pricing stratgies: cost plus pricing, marginal cost pricing, rate of return pricing, price skimming, penetration pricing, loss-leader pricing, mark-up pricing and administred prices.

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)
DEPARMENT OF ECONOMICS
B.A. I YEAR, CHOICE BASED CREDIT SYSTEM SYLLABUS (2017-2018)
SEMESTER-II, MICRO ECONOMICS, Discipline Specific Course – Paper – II

Course Title: Micro Economics
Nature of Course: Core **Total Hours: 90**
Number of Credits: 5

Module I: Types of Revenue and Objectives of Firm **21Hrs**

Behavior of the Firm. Concept of Revenue: Total Revenue (TR), Average Revenue (AR) and Marginal Revenue (MR). Relationship between AR and MR and the Elasticity of Market Demand. Traditional Objectives of the Firm: Profit Maximization.

Module II: Perfect Competition and Monopoly **17Hrs**

Classification of Market.Perfect Competition, Short Run and Long Run Analysis. Equilibrium
of the Firm and Industry. Monopoly Features, Equilibrium. Discriminatory Pricing. Differences
between Perfect Competition and Monopoly.

Module III: Monopolistic Competition and Oligopoly Markets **15Hrs**

Monopolistic Competition.Product Differentiation, Selling Costs. Oligopoly: Homogeneous and Heterogeneous Oligopoly, Price Rigidity in Oligopoly. Kinky Demand Curve.

Module IV: Pricing Strategies **18Hrs**

Pricing Practices: Cost Plus Pricing, Marginal Cost Pricing, Rate of Return Pricing, Product Life Pricing, Price Skimming, Penetration Pricing, Markup Pricing. State Intervention and Administered Prices.

Module V: Distribution and Factor Pricing **19Hrs**

Functional and Personal Distribution.Marginal Productivity Theory of Distribution. Ricardo Theory of Rent and Quasi Rent.Theories of Wages.Theories of Profit.Risk and Uncertainty. Concept of Interest.

References:
1. M L Seth : Micro Economics
2. M L Jhingoan: :Micro Economics
3. H L Ahuja: :Modern Micro Economics
4. Koutsainies: :Modern Micro Economics
5. Stonier and Hague : Micro Economics
6. Salvatore : Micro economics
7. SchaumSeries : Micro economics

Generation and crystallisation of magmas. Crystallisation of albite—anorthite, diopside—anorthite and diopside—wollastonite—silica systems. Bowen's Reaction Principle; Magmatic differentiation and assimilation. Petrogenetic significance of the textures and structures of igneous rocks. Petrography and petrogenesis of granite, syenite, diorite, basic and ultrabasic groups, charnockite, anorthosite and alkaline rocks. Carbonatites. Deccan volcanic province.

Types and agents of metamorphism. Metamorphic grades and zones; Phase rule. Facies of regional and contact metamorphism; ACF and AKF diagrams; Textures and structures of metamorphic rocks. Metamorphism of arenaceous, argillaceous and basic rocks; Minerals assemblages. Retrograde metamorphism; Metasomatism and granitisation, migmatites. Granulite terrains of India.

3. Sedimenary Petrology :

Sedimentas and Sedimentary rocks: Processes of formation; digenesis and lithification; Clastic and non-clastic rocks-their classification, petrography and depositional environment; Sedimentary facies and provenance. Sedimentary structures and their significance. Heavy minerals and their significance. Sedimentary basins of India.

4. Economic Geology :

Ore, ore mineral and gangue, tenor of ore. Classification of ore deposits; Processes of formation of mineral deposits; Controls of ore localisation; Ore texures and structures; Metallogenic epochs and provinces; Geology of the important Indian deposits of aluminium, chromium, copper, gold, iron, lead, zinc, manganese, titanium, uranium and thorium and industrial minerals; Deposits of coal and petroleum in India, National Mineral Policy; Conservation and utilization of mineral resources. Marine mineral resources and Law of Sea.

5. Mining Geology :

Methods of prospecting—geological, geophysical, geochemical and geobotanical; Techniques of sampling. Estimation of reserves of ore; Methods of exploration and mining-metallic ores, industrial minerals, marine mineral resources and building stones. Mineral beneficiation and ore dressing.

6. Geochemistry and Environmental Geology :

Cosmic abundance of elements. Composition of the planets and meteorites. Structure and composition of earth and distribution of elements. Trace elements. Elements of crystal chemistry-types of chemical bonds, coordination number. Isomorphism and polymorphism. Elementary thermodynamics.

Natural hazards—floods, mass wasting, costal hazards, earthquakes and volcanic activity and mitigation; Environmental impact of urbanization, mining, industrial and radioactive waste disposal, use of fertilizers, dumping of mine waste and fly-ash. Pollution of ground and surface water, marine pollution. Environment protection—legislative measures in India; Sea level changes: causes and impact.

HISTORY

PAPER I

1. Sources

Archaeological sources :

Exploration, excavation, epigraphy, numismatics, monuments.

Literary sources:

Indigenous: Primary and secondary; poetry, scientific literature, literature, literature in regional languages, religious literature.

Foreign account: Greek, Chinese and Arab writers.

2. Pre-history and Proto-history :

Geographical factors; hunting and gathering (paleolithic and mesolithic); Beginning of agriculture (neolithic and chalcolithic).

3. Indus Valley Civilization :

Origin, date, extent, characteristics-decline, survival and significance, art and architecture.

4. Megalithic Cultures :

Distribution of pastoral and farming cultures outside the Indus, Development of community life, Settlements, Development of agriculture, Crafts, Pottery, and Iron industry.

5. Aryans and Vedic Period :

Expansions of Aryans in India :

Vedic Period: Religious and philosophic literature; Transformation from Rig Vedic period to the later Vedic period; Political, social and economical life; Significance of the Vedic Age; Evolution of Monarchy and Varna system.

6. Period of Mahajanapadas :

Formation of States (Mahajanapada): Republics and monarchies; Rise of urban centres; Trade routes; Economic growth; Introduction of coinage; Spread of Jainism and Buddism; Rise of Magadha and Nandas.

Iranian and Mecedonian invasions and their impact.

7. Mauryan Empire :

Foundation of the Mauryan Empire, Chandragupta, Kautilya and Arthashastra; Ashoka; Concept of Dharma; Edicts; Polity, Administration, Economy; Art, architecture and sculpture; External contacts; Religion; Spread of religion; Literature.

Disintegration of the empire; sungas and Kanvas.

8. Post-Mauryan Period (Indo-Greeks, Sakas, Kushanas, Western Kshatrapas) :

Contact with outside world; growth of urban centres, economy, coinage, development of religions, Mahayana, social conditions, art, architecture, culture, literature and science.

9. Early State and Society in Eastern India, Deccan and South India:

Kharavela, The Satavahanas, Tamil States of the Sangam Age; Administration, Economy, land grants, coinage, trade guilds and urban centres; Buddhist centres; Sangam literature and culture; Art and architecture.

10. Guptas, Vakatakas and Vardhanas:

Polity and administration, Economic conditions, Coinage of the Guptas, Land grants, Decline of urban centres, Indian feudalism, Caste system, Position of women, Education and educational

institutions; Nalanda, Vikramshila and Vallabhi, Literature, scientific literature, art and architecture.

11. Regional States during Gupta Era:

The Kadambas, Pallavas, Chalukyas of Badami; Polity and Administration, Trade guilds, Literature; growth of Vaishnava and Saiva religions. Tamil Bhakit movement, Shankaracharya; Vedanta; Institutions of temple and temple architecture; Palas, Senas, Rashtrakutas, Paramaras, Polity and administration; Cultural aspects. Arab conquest of Sind; Alberuni, The Chaluky as of Kalyana, Cholas, Hoysalas, Pandyas; Polity and Administration; Local Government; Growth of art and architecture, religious sects, Institution of temple and Mathas, Agraharas, education and literature, economy and society.

12. Themes in Early Indian Cultural History:

Languages and texts, major stages in the evolution of art and architecture, major philosophical thinkers and schools, ideas in Science and Mathematics.

13. Early Medieval India, 750-1200:

- Polity: Major political developments in Northern India and the peninsula, origin and the rise of Rajputs.
- The Cholas: administration, village economy and society "Indian Feudalism".
- Agrarian economy and urban settlements.
- Trade and commerce.
- Society: the status of the Brahman and the new social order.
- Condition of women.
- Indian science and technology.

14. Cultural Traditions in India, 750-1200:

- Philosophy: Skankaracharya and Vedanta, Ramanuja and Vishishtadvaita, Madhva and Brahma-Mimansa.
- Religion: Forms and features of religion, Tamil devotional cult, growth of Bhakti, Islam and its arrival in India, Sufism.
- Literature: Literature in Sanskrit, growth of Tamil literature, literature in the newly developing languages, Kalhan's Rajtarangini, Alberuni's India.
- Art and Architecture: Temple architecture, sculpture, painting.

15. The Thirteenth Century:

- Establishment of the Delhi Sultanate: The Ghurian invasions - factors behind Ghurian success.
- Economic, Social and cultural consequences.
- Foundation of Delhi Sultanate and early Turkish Sultans.
- Consolidation: The rule of Iltutmish and Balban.

16. The Fourteenth Century:

- "The Khalji Revolution".

— Alauddin Khalji: Conquests and territorial expansion, agrarian and economic measure.

— Muhammad Tughluq: Major projects, agrarian measures, bureaucracy of Muhammad Tughluq.

— Firuz Tugluq: Agrarian measures, achievements in civil engineering and public works, decline of the Sultanate, foreign contacts and Ibn Battuta's account.

17. Society, Culture and Economy in the Thirteenth and Fourteenth Centuries:

— Society: composition of rural society, ruling classes, town dwellers, women, religious classes, caste and slavery under the Sultanate, Bhakti movement, Sufi movement.

— Culture: Persian literature, literature in the regional languages of North India, literaute in the languages of South India, Sultanate architecture and new structural forms, painting, evolution of a composite culture.

— Economy: Agricultural Production, rise of urban economy and non-agricultural production, trade and commerce.

18. The Fifteenth and Early Sixteenth Century-Political Developments and Economy:

— Rise of Provincial Dynasties : Bengal, Kashmir (Zainul Abedin), Gujarat.

— Malwa, Bahmanids.

— The Vijayanagara Empire.

— Lodis.

— Mughal Empire, first phase : Babur, Humayun.

— The Sur Empire : Sher Shah's administration.

— Portuguese colonial enterprise, Bhakti and Sufi Movements.

19. The Fifteenth and Early Sixteenth Century- Society and culture:

— Regional cultures specificities.

— Literary traditions.

— Provincial architectural.

— Society, culture, literature and the arts in Vijayanagara Empire.

20. Akbar:

— Conquests and consolidation of empire.

— Establishment of *jagir* and *mansab* systems.

— Rajput policy.

— Evolution of religious and social outlook. Theory of *Sulh-i-kul* and religious policy.

— Court patronage of art and technology.

21. Mughal Empire in the Seventeenth Century:

— Major administrative policies of Jahangir, Shahjahan and Aurangzeb.

— The Empire and the Zamindars.

— Religious policies of Jahangir, Shahjahan and Aurangzeb.

— Nature of the Mughal State.

— Late Seventeenth Century crisis and the revolts.

— The Ahom kingdom.

— Shivaji and the early Maratha Kingdom.

22. Economy and society, in the 16th and 17th Centuries:

— Population Agricultural and craft production.

— Towns, commerce with Europe through Dutch, English and French companies : a trade revolution.

— Indian mercantile classes. Banking, insurance and credit systems.

— Conditions of peasants, Condition of Women.

— Evolution of the Sikh community and the Khalsa Panth.

23. Culture during Mughal Empire:

— Persian histories and other literature.

— Hindi and religious literatures.

— Mughal architecture.

— Mughal painting.

— Provincial architecture and painting.

— Classical music.

— Science and technology.

24. The Eighteenth Century:

— Factors for the decline of the Mughal Empire.

— The regional principalities: Nizam's Deccan, Bengal, Awadh.

— Maratha ascendancy under the Peshwas.

— The Maratha fiscal and financial system.

— Emergence of Afghan power Battle of Panipat, 1761.

— State of, political, cultural and economic, on eve of the British conquest.

PAPER-II

1. European Penetration into India:

The Early European Settlements; The Portuguese and the Dutch; The English and the French East India Companies; Their struggle for supremacy; Carnatic Wars; Bengal-The conflict between the English and the Nawabs of Bengal; Siraj and the English; The Battle of Plassey; Significance of Plassey.

2. British Expansion in India:

Bengal-Mir Jafar and Mir Kasim; The Battle of Buxar; Mysore; The Marathas; The three Anglo-Maratha Wars; The Punjab.

3. Early Structure of the British Raj:

The Early administrative structure; From diarchy to direct contol; The Regulating Act (1773); The Pitt's India Act (1784); The Charter Act (1833); The Voice of free trade and the changing character of British colonial rule; The English utilitarian and India.

4. **Economic Impact of British Colonial Rule:**

(a) Land revenue settlements in British India; The Permanent Settlement; Ryotwari Settlement; Mahalwari Settlement; Economic impact of the revenue arrangements; Commercialization of agriculture; Rise of landless agrarian labourers; Impoverishment of the rural society.

(b) Dislocation of traditional trade and commerce; De-industrialisation; Decline of traditional crafts; Drain of wealth; Economic transformation of India; Railroad and communication network including telegraph and postal services; Famine and poverty in the rural interior; European business enterprise and its limitations.

5. **Social and Cultural Developments:**

The state of indigenous education, its dislocation; Orientalist-Anglicist controversy, The introduction of western education in India; The rise of press, literature and public opinion; The rise of modern vernacular literature; Progress of Science; Christian missionary activities in India.

6. **Social and Religious Reform Movements in Bengal and Other Areas:**

Ram Mohan Roy, The Brahmo Movement; Devendranath Tagore; Iswarchandra Vidyasagar; The Young Bengal Movement; Dayanada Saraswati; The social reform movements in India including Sati, widow remarriage, child marriage etc.; The contribution of Indian renaissance to the growth of modern India; Islamic revivalism-the Feraizi and Wahabi Movements.

7. **Indian Response to British Rule:**

Peasant movement and tribal uprisings in the 18th and 19th centuries including the Rangpur Dhing (1783), the Kol Rebellion (1832), the Mopla Rebellion in Malabar (1841-1920), the Santal Hul (1855), Indigo Rebellion (1859-60), Deccan Uprising (1875) and the Munda Ulgulan (1899-1900); The Great Revolt of 1857 —Origin, character, casuses of failure, the consequences; The shift in the character of peasant uprisings in the post-1857 period; the peasant movements of the 1920s and 1930s.

8. Factors leading to the birth of Indian Nationalism; Politics of Association; The Foundation of the Indian National Congress; The Safety-valve thesis relating to the birth of the Congress; Programme and objectives of Early Congress; the social composition of early Congress leadership; the Moderates and Extremists; The Partition of Bengal (1905); The Swadeshi Movement in Bengal; the economic and political aspects of Swadeshi Movement; The beginning of revolutionary extremism in India.

9. Rise of Gandhi; Character of Gandhian nationalism; Gandhi's popular appeal; Rowlatt Satyagraha; the Khilafat Movement; the Non-cooperation Movement; National politics from the end of the Non-cooperation movement to the beginning of the Civil Disobedience Movement; the two phases of the Civil Disobedience Movement; Simon Commission; The Nehru Report; the Round Table Conferences; Nationalism and the Peasant Movements; Nationalism and Working class movements; Women and Indian youth and students in Indian politics (1885-1947); the election of 1937 and the formation of ministries; Cripps Mission; the Quit India Movement; the Wavell Plan; The Cabinet Mission.

10. Constitutional Developments in the Colonial India between 1858 and 1935.

11. Other strands in the National Movement.

    The Revolutionaries: Bengal, the Punjab, Maharashtra, U.P. the Madras Presidency, Outside India.

    The Left; The Left within the Congress: Jawaharlal Nehru, Subhas Chandra Bose, the Congress Socialist Party; the Communist Party of India, other left parties.

12. Politics of Separatism; the Muslim League; the Hindu Mahasabha; Communalism and the politics of partition; Transfer of power; Independence.

13. Consolidation as a Nation; Nehru's Foreign Policy; India and her neighbours (1947-1964); The linguistic reorganisation of States (1935-1947); Regionalism and regional inequality; Integration of Princely States; Princes in electoral politics; the Question of National Language.

14. Caste and Ethnicity after 1947; Backward Castes and Tribes in post-colonial electoral politics; Dalit movements.

15. Economic development and political change; Land reforms; the politics of planning and rural reconstruction; Ecology and environmental policy in post-colonial India; Progress of Science.

16. **Enlightenment and Modern ideas:**

(i) Major Ideas of Enlightenment : Kant, Rousseau.

(ii) Spread of Enlightenment in the colonies.

(iii) Rise of socialist ideas (up to Marx); spread of Marxian Socialism.

17. **Origins of Modern Politics :**

(i) European States System.

(ii) American Revolution and the Constitution.

(iii) French Revolution and Aftermath, 1789-1815.

(iv) American Civil War with reference to Abraham Lincoln and the abolition of slavery.

(v) British Democratic politics, 1815-1850 : Parliamentary Reformers, Free Traders, Chartists.

18. **Industrialization :**

(i) English Industrial Revolution : Causes and Impact on Society.

(ii) Industrialization in other countries : USA, Germany, Russia, Japan.

(iii) Industrialization and Globalization.

19. **Nation-State System :**

(i) Rise of Nationalism in 19th century.

(ii) Nationalism : State-building in Germany and Italy.

(iii) Disintegration of Empires in the face of the emergence of nationalities across the World.

20. **Imperialism and Colonialism :**

(i) South and South-East Asia.

(ii) Latin America and South Africa.

(iii) Australia.

(iv) Imperialism and free trade: Rise of neo-imperialism.

21. Revolution and Counter-Revolution :

(i) 19th Century European revolutions.

(ii) The Russian Revolution of 1917-1921.

(iii) Fascist Counter-Revolution, Italy and Germany.

(iv) The Chinese Revolution of 1949.

22. World Wars :

(i) 1st and 2nd World Wars as Total Wars : Societal implications.

(ii) World War I : Causes and Consequences.

(iii) World War II : Causes and Consequences.

23. The World after World War II:

(i) Emergence of Two power blocs.

(ii) Emergence of Third World and non-alignment.

(iii) UNO and the global disputes.

24 . Liberation from Colonial Rule :

(i) Latin America-Bolivar.

(ii) Arab World-Egypt.

(iii) Africa-Apartheid to Democracy.

(iv)South-East Asia-Vietnam.

25. Decolonization and Underdevelopment :

(i) Factors constraining Development ; Latin America, Africa.

26. Unification of Europe :

(i) Post War Foundations ; NATO and European Community.

(ii) Consolidation and Expansion of European Community

(iii) European Union.

27. Disintegration of Soviet Union and the Rise of the Unipolar World :

(i) Factors leading to the collapse of Soviet Communism and Soviet Union, 1985-1991.

(ii) Political Changes in East Europe 1989-2001.

(iii) End of the Cold War and US Ascendancy in the World as the lone superpower.

LAW

PAPER-I

Constitutional and administrative Law :

1. Constitution and Constitutionalism:The distinctive features of the Constitution.
2. Fundamental Rights—Public interest litigation; Legal Aid; Legal services authority.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD
(AUTONOMOUS)
DEPARTMENT OF HISTORY
B.A. (HISTORY) SYLLABUS Semester - I
History of India (From Earliest Times to c.700 CE)

Module-I: Definitions - Nature and Scope of History - History and Its Relationship with other Social Sciences - Geographical Features of India – Sources of Indian History: Pre History – Paleolithic, Mesolithic, Neolithic, Chalcolithic and Megalithic Cultures.

Module-II: Indus Valley Civilization - Its Features & Decline; Early Vedic and Later Vedic Civilizations – Vedic Literature – Society – Economy - Polity – Religion.

Module-III: Rise of New Religious Movements – Charvakas, Lokayathas, Jainism and Buddhism; Mahajanapadas - Rise of Magadha; Alexander's Invasion and Its Impact.

Module-IV: Foundation of the Mauryan Dynasty; Ashoka and His Dharma – Polity – Administration - Society – Economy – Religion – Literature - Art and Architecture; Disintegration of the Mauryan Empire; Post-Mauryan Kingdoms - Indo-Greeks - Kushanas and Kanishka - Society – Economy – Literature – Art and Architecture; The Satavahanas; Sangam Age – Literary Development.

Module-V: Gupta Empire: A Brief Political Survey - Polity and Administration, Social and Economic Conditions, Agriculture and Land Grants - Feudalism, Caste System, Position of Women, Education, Literature, Science and Technology, Art and Architecture - Harshavardana and His Achievements.

Chairman, Board of Studies
Department of History
Osmania University, Hyderabad-7, A.P.

HEAD
Department of History
Osmania University
Hyderabad, Telangana State

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD

Autonomous

Department of history

Semester – II/ Module – II (5 Credits)

HISTORY OF INDIA (c.700-1526 CE) – II

SYLLABUS

Module –I

Rise of Regional States: Pallavas, Chalukyas of Badami, Rashtrakutas, Cholas; Local Self Government under Cholas; Society, Economy, Literature, Arts and Architecture; Bhakti Movement in South India: Shiva Nayanars and vaishnava Alwars.

Module – II

Arab Conquest of Sind, Ghaznavids and Ghoris; Foundation od Delhi Sultanate: Slave, Khalijis,Tughlaqs, Sayyids and Lodis – Polity, Administration , Society and Economy – Art and Architecture – Growth of Education and Literature - Religious Conditions.

Module – III

Bhakti and Sufi Movements and their Impact on Society and Culture - Emergence of Composite Culture.

Module – IV

Kakatiyas – Polity – Administration – Society and Economy - Literature and Reigion – Art and Architecture – Yadavas – Hoysalas and Pandyas – Brief History.

Module – V

Vijayanagara – Polity - Administration – Society and Economy – Religion -Art and Achitecture – Language and Literature – Bahamanis and their Contribution to the Deccan Culture.

Recommended Books:

- A.L.Basham, The Wonder that was India, Rupa & Co., New Delhi, 2021.
- Irfan Habib, Medieval India – I OUP, Delhi, 1999.

Chairman, Board of Studies
Department of History

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD
(AUTONOMOUS)
DEPARTMENT OF HISTORY
B.A. (HISTORY) SYLLABUS SEMESTER - III
History of India (1526-1857 CE)

Module-I: Establishment of Mughal Dynasty - Sources – Shershah Sur and His Reforms - Brief Survey of Political History of Mughals – Akbar, Shah Jahan and Aurangzeb -Polity - Administration – Society – Economy – Technological Developments - Religion – Hindu-Muslim Relations – Emergence of Composite Culture – Education – Language and Literature – Art and Architecture - Disintegration of Mughal Empire.

Module-II: Rise of Regional Powers - Marathas – Shivaji his Military Achievements, and his Administration – The Rise of Peshwas – and their role in Maratha History - The Third Battle of Panipat – The Rise of Sikhs. – Ranjit Singh – Rise of Princeley States – Hyderabad – Avad - Junagarh – Mysore – Kashmir.

Module-III: Advent of European Powers - Portuguese, Dutch, English and French, Anglo-French Rivalry - Expansion and Consolidation of British Power – Wellesley's Subsidiary Alliance – Dalhousie's Doctrine of Lapse.

Module-IV: Three Stages of Colonialism – Mercantilism - Free Trade Policies – Finance Capital - Land Revenue Settlements – Cornwallis and Permanent Revenue Settlement; Thomas Munroe and Ryotwari; Mahalwari System – Changes in the Agrarian Economy and Condition of Peasantry – Famines.

Module-V: Decline of Rural Cottage Industries and Urban Handicrafts - Growth of Railways, Roads, Communication – Modern Industries – Coal Mines, Textiles, Iron and Steel, etc. - Anti-Colonial Upsurge - 1857 Revolt – Nature, Causes and Results.

Chairman, Board of Studies
Department of History
Osmania University, Hyderabad-7, A.P.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD
(AUTONOMOUS)
DEPARTMENT OF HISTORY
B.A. (HISTORY) SYLLABUS Semester – IV
History of India (1858-1964 CE)(2020-2021)

Module-I: Queen's Proclamation – Beginning of Colonial Rule – Introduction of Western Education – Role of Christian Missionaries – Press, Communication and Emergence of Middle Classes - Lytton and Rippon: Impact of their Policies.

Module-II: Socio-Religions Reform Movements – Brahma Samaj - Arya Samaj - Theosophical Society - Ramakrishna Mission - Aligarh Movement; Anti-Caste Movements - Jyotibha Phule - Narayana Guru - Periyar Ramaswamy Naicker and Dr. B.R. Ambedkar.

Module-III: Factors for the Rise of Nationalism – Formation of Indian National Congress – Three Phases of Freedom Struggle: Moderate Phase, Extremist Phase and Gandhian Era - Non-Cooperation, Civil Disobedience and Quit Indian Movement; Indian National Army and Subhash Chandra Bose.

Module-IV: Revolutionary Movement: Gadhar Party – Bhagath Singh – Chandra Sekhar Azad and Others; Left-Wing Movement – Rise of Socialist and Communist Parties - Peasant and Workers Movements.

Module-V: Emergence of Communal Politics and Mohd. Ali Jinnah – Prelude to Partition of India - Sardar Vallabhai Patel and Integration of Princely States into Indian Union – Republic of India – Jawaharlal Nehru and His Policies.

HEAD
Department of History
Osmania University
Hyderabad, Telangana State

Chairman, Board of Studies
Department of History
Osmania University, Hyderabad-7. T.S.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) BEGUMPET, HYDERABAD
SEMESTER –III/Paper-III
DEPARTMENT OF HISTORY 2018-19

History of India (1526-1857 CE)

Discipline Specific Course (DSC) -
syllabus

Max.90 hrs
20hrs

Module-I: Establishment of Mughal Dynasty - Sources – Shershah Sur and His Reforms - Brief Survey of Political History of Mughals – Akbar, Shah Jahan and Aurangzeb - Polity - Administration – Society – Economy – Technological Developments - Religion – Hindu-Muslim Relations – Emergence of Composite Culture – Education – Language and Literature – Art and Architecture - Disintegration of Mughal Empire.

15hrs

Module-II: Rise of Regional Powers - Marathas – Shivaji and His Administration – Peshwas - Sikhs.

20hrs

Module-III: Advent of European Powers - Portuguese, Dutch, English and French, Anglo-French Rivalry - Expansion and Consolidation of British Power – Wellesley's Subsidiary Alliance – Dalhousie's Doctrine of Lapse.

20hrs

Module-IV: Three Stages of Colonialism – Mercantilism - Free Trade Policies – Finance Capital - Land Revenue Settlements – Cornwallis and Permanent Revenue Settlement; Thomas Munroe and Ryotwari; Mahalwari System – Changes in the Agrarian Economy and Condition of Peasantry – Famines.

15hrs

Module-V: Decline of Rural Cottage Industries and Urban Handicrafts - Growth of Railways, Roads, Communication – Modern Industries – Coal Mines, Textiles, Iron and Steel, etc. - Anti-Colonial Upsurge - 1857 Revolt – Nature, Causes and Results.

TELANGANA STATE
B.A. (HISTORY) SYLLABUS
Semester - IV
History of India (1858-1964 CE)
Discipline Specific Course - Paper - IV

Module-I: Queen's Proclamation – Beginning of Colonial Rule – Introduction of Western Education – Role of Christian Missionaries – Press, Communication and Emergence of Middle Classes - Lytton and Rippon: Impact of their Policies.

Module-II: Socio-Religions Reform Movements – Brahma Samaj - Arya Samaj - Theosophical Society - Ramakrishna Mission - Aligarh Movement; Anti-Caste Movements - Jyotibha Phule - Narayana Guru - Periyar Ramaswamy Naicker and Dr. B.R. Ambedkar.

Module-III: Factors for the Rise of Nationalism – Formation of Indian National Congress – Three Phases of Freedom Struggle: Moderate Phase, Extremist Phase and Gandhian Era - Non-Cooperation, Civil Disobedience and Quit Indian Movement; Indian National Army and Subhash Chandra Bose.

Module-IV: Revolutionary Movement: Gadhar Party – Bhagath Singh – Chandra Sekhar Azad and Others; Left-Wing Movement – Rise of Socialist and Communist Parties - Peasant and Workers Movements.

Module-V: Emergence of Communal Politics and Mohd. Ali Jinnah – Prelude to Partition of India - Sardar Vallabhai Patel and Integration of Princely States into Indian Union – Republic of India – Jawaharlal Nehru and His Policies.

Recommended Books:

A.R. Desai, *Social Background of Indian Nationalism*, Popular Prakashan Pvt. Ltd., Mumbai, 2002.
Bipan Chandra (et.al.), *India's Struggle for Independence*, Penguin Books, Kolkata, 2001.
Bipan Chandra, *A History of Modern India.*
Kenneth Jones, *Social and Religious Reform Movements in India.*
R.C. Majumdar (ed.), *A History and Culture of India People*, Bharatiya Vidya Bhavan Series (Relevant Vols.).
R.C. Majumdar, H.C. Raychaudhuri & K. Datta, *An Advanced History of India*, Macmillan, Madras, 1995.
S. Gopal, *Jawaharlal Nehru – A Biography.*
Sumit Sarkar, *Modern India (1885-1947)*, Macmillan India Ltd., Madras, 1995.
Tarachand, *A History of the Freedom Movement in India*, Four Volumes.
V.D. Mahajan, *Modern Indian History.*

Telugu:

B. Vijaya Bharati, *Mahatma Jyothirao Phule* (Translation), Hyderabad Book Trust, 2004.
Bhoopati Laxminarayana Rao, *Bharatadesa Swathantra Charitra* (Part – 3), (Translation), Telugu Academy, 2005.
Bipan Chandra, *Adhunika Bharatadesa Charitra* (Translation Sahavasi), Hyderabad Book Trust.
J. Durga Prasad and Others, *Bharatadesa Charitra (upto 1526-1964 A.D.)*, Telugu Academy, 2006.
V. Rama Krishna Reddy, *Bharatadesa Charitralo Mukhya Ghattalu*, Telugu Academy, 2005.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) BEGUMPET, HYDERABAD

B.A. (HISTORY) SYLLABUS

Semester - V

World History (1453-1815 CE)

Discipline Specific Course – Paper – V

(CBCS - 2018-2019)

Max Hrs 90 hrs

Hrs 20

Module-I: Fall of Constantinople (1453 C.E.) – Beginning of Modern Age in Europe – Geographical Discoveries and Scientific Inventions and their impact on Society – Rise of New Ideas – Spirit of Humanism – Renaissance – Meaning-Causes and Results – Impact of Renaissance on Europe.

Hrs 25

Module-II: Reformation Movement – Causes – Martin Luther, John Calvin and Zwingli; Counter Reformation Movement and Ignatius Loyola – Results of Reformation and Counter Reformation.

Hrs 20

Module-III: Emergence of Nation States – Causes – Spain – Charles V; England – Henry VIII - Glorious Revolution (1688); France under Bourbons – Louis XIV; Era of Enlightened Despotism – Peter the Great and his Policies – Frederick the Great and his Achievements.

Hrs 25

Module-IV: End of Feudalism – Industrial Revolution – Causes for Industrialization in England and Europe – Textile Industry – Working Class Movement – American War of Independence (1776) – French Revolution (1789) – Causes, Course, Results and its Impact. Factors for the Rise of Napoleon – Domestic and Foreign Policies – Fall of Napoleon.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) BEGUMPET, HYDERABAD

Semester - V

History of Telangana (From Earliest Times to 1724 CE)

Discipline Specific Elective - Paper - I (A)

(CBCS - 2018-2019)

20hr

Module-I: Sources – Archaeological and Literary Sources - Geographical Features of Telangana - Pre History – The Age of Satavahanas – Origin – Administration - Society and Economy – Religion - Language & Literature - Art & Architecture

20hr

Module-II: Post-Satavahana Period - Ikshvakus – Vishnukundins – A Brief Political History – Society – Economy – Religion - Language & Literature - Art & Architecture – Origin and Early History of Chalukyas of Badami and their Contribution to Culture - Chalukyas of Vemulavada & Mudigonda - Political History – Society – Economy – Religion - Language & Literature - Art & Architecture.

25hr

Module-III: Kakatiyas – Origin and Early History – Ganapatideva, Rudramadevi and Prataparudra - Administration - Society – Economy – Language & Literature - Art & Architecture – Sammakka-Sarakka Revolt - Post-Kakatiya Political Developments – Musunuri Nayakas, Recherla Rulers – Their Contribution to Culture.

25hr

Module-IV: Qutb Shahis of Golconda – Origin and Political History – Society – Economy - Agriculture – Irrigation – Trade & Commerce – Religion – Language & Literature

– Art & Architecture – Political Conditions in Telangana from 1687 to 1724 – Life and Times of Sarvai Papanna.

Calendar work

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) BEGUMPET, HYDERABAD

Semester - VI

World History (1815-1950 CE)

Discipline Specific Course - Paper - VI

(CBCS - 2018-2019)

max = 90 hrs

25 hr

Module-I: Congress of Vienna (1815) – Principles and Impact; Metternich and his System – 1830 and 1848 French Revolutions: Unification of Italy – Role of Joseph Mazzini, Count Cavour and Garibaldi; Unification of Germany – Role of Bismarck; Significance of the Unification Movements.

25hr

Module-II: Factors responsible for the outbreak of First World War (1914-18) – Results – Treaty of Versailles – Its Provisions and Consequences; Russian Revolution (1917) – Causes – The role of Lenin – Results; League of Nations (1920) – Its Achievements and Failures.

20hr

Module-III: Europe between World Wars: Turkey under Mustafa Kamal Pasha - The Great Economic Depression and its Impact - Mussolini and the Rise of Fascism in Italy - Hitler and Nazism in Germany - Militarism in Japan.

20hr

Module-IV: Second World War – Causes and Results; Establishment of United Nations Organization (1945) – Its Aims and Achievements; Cold War and Its Impact; Colonization of Asia - India and China under Colonial Rule, Role of Gandhi in Indian National Movement (1920-1947); Sun-Yat-Sen and His Ideas; Role of Mao-Tse-Tung in Chinese Revolution – 1949.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS) BEGUMPET, HYDERABAD

Semester - VI

History of Telangana (1724-2014 CE)

Discipline Specific Elective - Paper - II (A)

(CBCS - 2018-2019)

Module-I:. Foundation of Asaf Jahi Dynasty – Nizam-ul-Mulk to Mir Mahaboob Ali Khan – Nizam-British Relations – Salarjung Reforms - Modernization of Hyderabad – 1857 Revolt and Adivasi Rebellion – Ramji Gond – Rekapalli Revolt - The Rule of Mir Osman Ali Khan – Agriculture, Irrigation, Modern Industries and Economic Development – Coal Mines, Railways, Roads, Posts and Telegraph – Educational Reforms – Osmania University – Public Health.

Module-II: Social, Cultural and Political Awakening in Telangana – Press, Journalism and Library Movements – Arya Samaj and Its Activities – Ittehad-ul-Muslimeen – Bhagya Reddy Verma and Dalit Movements - The Role of Andhra Maha Sabha – Hyderabad State Congress – Political Developments in Hyderabad State – Administrative and Constitutional Reforms – Mulki-Non-Mulki Issue 1930 – Vandemataram Movement – Communist Party and Its Activities – Andhra Mahila Sabha and Women's Movement.

Module-III: Anti-Nizam and Anti-Feudal Struggles – Telangana Peasants Armed Struggle 1946-51 – Revolt by Kumaram Bheem – Razakars and Their Activities – Police Action, 1948 – Formation of Popular Ministry in 1952 – Assertion of Mulki Identity and the City College Incident 1952 – Merger of Telangana and the Formation of Andhra Pradesh 1956.

Module-IV: Discrimination, Dissent and Protest – Violation of Gentlemen's Agreement – Agitation for Separate Telangana State: Formation of Telangana Praja Samithi – Role of Intellectuals, Students and Employees in 1969 Movement – Second Phase Movement for Separate Telangana – Formation of Various Associations – Telangana Aikhya Vedika – Telangana Jana Sabha - Telangana Rashtra Samithi 2001 - Role of Osmania and Kakatiya University Students and Others - Formation of Telangana Political Joint Action Committee and Its Role in the Movement - Mass Mobilization – Sakala Janula Samme – Million March – Sagara Haram, Chalo Assembly – Sri Krishna Committee and Its Recommendations – December 2009 Declaration and Later Developments - The Formation of Telangana State, June 2014.

(2) Kambaramayanam : Kumbakarunan Vadhai Padalam.

Part 3 : Devotional Literature

(1) Tiruvasagam : Neetthal Vinnappam

(2) Tiruppavai : (Full Text).

Section B

Modern Literature

Part 1 : Poetry

(1) Bharathiar : Kannan Pattu

(2) Bharathidasan : Kudumba Vilakku

(3) Naa. Kamarasan : Karappu Malarkal

Prose

(1) Mu. Varadharajanar : Aramum Arasiyalum

(2) C. N. Annadurai : Ye! Thazhntha Tamilagame.

Part 2 : Novel, Short Story and Drama

(1) Akilon ; Chittairappavai

(2) Jayakanthan : Gurupeedam

(3) Cho : Yaurkkum Vetkamillai

Part 3 : Folk Literature

(1) Muthuppattan kathai Edited by Na. Vanamamalai, (Publication : Madurai Kamaraj University).

(2) Malaiyaruvi, Edited by Ki. Va Jagannathan (Publication : Saraswathi Mahal, Thanjavur).

TELUGU

PAPER I

Answer must be written in Telugu

Section A : Language

1. Place of Telugu among Dravidian languages and its antiquity—Etymological History of Telugu,Tenugu and Andhra.
2. Major linguistic changes in phonological, morphological, grammatical and syntactical levels, from Proto-Dravidian to old Telugu and from old Telugu to Modern Telugu.
3. Evolution of spoken Telugu when compared to classical Telugu-Formal and functional view of Telugu language.
4. Influence of other languages and its impact on Telugu.
5. Modernization of Telugu language :
   (a) Linguistic and literary movements and their role in modernization of Telugu.
   (b) Role of media in modernization of Telugu (News-papers, Radio, TV etc.)
   (c) Problems of terminology and mechanisms in coining new terms in Telugu in various

discourses including scientific and technical.

6. Dialects of Telugu—Regional and social variations and problems of Standardization.
7. Syntax—Major divisions of Telugu sentences—simple, complex and compound sentences—Noun and verb predications—Processes of nominalization and relativization—Direct and indirect reporting-conversion processes.
8. Translation—Problems of translation, cultural, social and idiomatic—Methods of translation—Approaches to translation—Literary and other kinds of translation—Various uses of translation.

Section B : Literature

1. Literature in Pre-Nannaya Period—Marga and Desi poetry.
2. Nannaya Period—Historical and literary background of Andhra Mahabharata.
3. Saiva poets and their contribution—Dwipada, Sataka, Ragada, Udaharana.
4. Tikkana and his place in Telugu literature.
5. Errana and his literary works—Nachana Somana and his new approach to poetry.
6. Srinatha and Potana—Their works and contribution.
7. Bhakti poets in Telugu literature—Tallapaka Annamayya, ramadasu, tyagayya.
8. Evolution of prabandhas—Kavya and prabandha.
9. Southern school of Telugu literature-raghunatha Nayaka, chemakura vankatakavi and women poets-Literary forms like yakshagana, prose and padakavita.
10. Modern Telugu Literature and literary forms—Novel, Short Story, Drama, Playlet and poetic forms.
11. Literary Movements : Reformation, Nationalism, Neo-classisicism, Romanticism and Progressive, Revolutionary movements.
12. Digambarakavulu, feminist and dalit Literature.
13. Main divisions of folk literature—Performing folk arts.

PAPER II

Answer must be written in Telugu

This paper will require first hand reading of the prescribed texts and will be designed to test the candidate's critical ability, which will be in relation to the following approaches :—

(i) Aesthetic approach—Rassa, Dhawani, Vakroti and Auchitya—Formal and Structural-Imagery and Symbolism.

(ii) Sociological, Historical, Ideological, Psychological approaches.

Section A

1. Nannaya-Dushyanta Chritra (Adiparva 4th Canto verses 5—109).
2. Tikkana-Sri Krishna Rayabaramu (Udyoga parva-3rd Canto verses 1—144).
3. Srinath-Guna Nidhi Katha (Kasikhandam, 4th Canto, verses 76—133).

4. Pingali Surana-sugatri Salinulakatha (Kalapurno-dayamu 4 Canto verses, 60—142).
5. Molla-Ramayanamu (Balakanda including avatarika).
6. Kasula Purushothama Kavi—Andhra Nayaka Satakamu.

Section B

7. Gurajada Appa Rao—Animutyalu (Short stories).
8. Viswanatha Satyanarayana—Andhra prasasti.
9. Devulapalli Krishna Sastry—Krishnapaksham (excluding Uravsi and Pravasam).
10. Sri Sri-Maha prastanam.
11. Jashuva-Gabbilam (Part I).
12. C. Narayana Reddy—Karpuravasanta rayalu.
13. Kanuparti Varalakshmamma—Sarada lekhalu (Part I).
14. Atreya—N.G.O.
15. Racha Konda Viswanatha Sastry—Alpajaeevi.

URDU

PAPER I

Answer must be written in Urdu

Section A

Development of Urdu Language

(a) Development of Indo-Aryan
  (i) Old Indo-Aryan
  (ii) Middle Indo-Aryan
  (iii) New Indo-Aryan.

(b) Western Hindi and its dialects Brij Bhasha Khadi Boli, Haryanavi, Kannauji, Bundeli—Theories about the origin of Urdu language.

(c) Dakhani Urdu—origin and development, its significant linguistic features.

(d) Social and Cultural roots of Urdu language— and its distinctive features.

Script, Phonology, Morphology, Vocabulary.

Section B

(a) Genres and their development :
  (i) Poetry: Ghazal, Masnavi, Qasida, Marsia, Rubai Jadid Nazm.
  (ii) Prose : Novel, Short Story, Dastan, Drama, Inshaiya, Khutoot, Biography.

(b) Significant feaures of : (i) Deccani, Delhi and Lucknow schools, (ii) Sir Syed movement, Romantic movement, Progressive movement, Modernism.

(c) Literary Criticism and its development with reference to Hali, Shibli, Kaleemuddin Ahmad,

పాఠ్యప్రణాళిక :: 2018-19 :: మొదటి సంవత్సరం

మొదటి-సెమిస్టర్

I. 1. శకుంతలోపాఖ్యానం

2. సుభాషితములు

II. 3. కాసులు

4. 'ప్ర'పంచపదులు

III. 5. మామిడిపండు

IV. 6. వ్యాకరణం

సంధులు, సమాసాలు

సంధులు: సవర్ణదీర్ఘసంధి

గుణ సంధి

వృద్ధి సంధి

యణాదేశ సంధి
త్రికసంధి

గసడదవాదేశ సంధి

సమాసాలు: షష్ఠీ తత్పురుష

రూపకం

సంభావనా పూర్వపద కర్మధారయం

బహువ్రీహి

ద్వంద్వం

ద్విగు

రెండవ సెమిస్టర్

I. 1. గొడగూచి కథ

2. హనుమత్ సందేశము

II. 3. జయభేరి

4. అంతర్నాదము

III. 5. వెంకన్న

IV. 6. రుద్రమదేవి

పాఠ్యప్రణాళిక :: 2018-19 :: రెండవ సంవత్సరం

మూడవ-సెమిస్టర్

I. 1. ధర్మజుని వాక్చాతుర్యం

2. గుణనిధి కథ

II. 3. దేవరకొండ దుర్గం

4. గురుదక్షిణ

III. 5. సి.పి. బ్రౌన్ సాహిత్య సేవ

IV. 6. ఛందస్సు - అలంకారాలు

ఉత్పలమాల	ఉపమ
చంపకమాల	శ్లేష
ఆటవెలది	అర్థాంతరన్యాసం
తేటగీతి	వ్యాజస్తుతి

నాల్గవ సెమిస్టర్

I. 1. నారదుని గాన మాత్సర్యం

2. నారసింహ శతకం

II. 3. నరుడ నేను నరుడ నేను

4. ఆర్తగీతం

III. 5. కొండమల్లెలు

6. చలిచీమలు

(c) Mricchakatikam—Sudraka

(d) Mudraraksasam—Visakhadatta

(e) Uttararamacaritam—Bhavbhuti

(f) Ratnavali—Sriharshavardhana

(g) Venisamharam—Bhattanarayana

Group 4 Short notes in Sanskrit on the following :—

(a) Meghadutam—Kalidasa

(b) Nitisatakam—Bhartrhari

(c) Pancatantra—

(d) Rajatarangini—Kalhana

(e) Harsacaritam—Banabhatta

(f) Amarukasatakam—Amaruka

(g) Gitagovindam—Jayadeva.

Section B

This section will require first hand reading of the following selected texts :— (Questions from Groups 1 & 2 are to be answered in Sanskrit only) Questions from Groups 3 and 4 are to be answered either in Sanskrit or in the Medium opted by the candidate.

Group 1 (a) Raghuvamsam—CantoI, Verses 1 to 10

(b) Kumarasambhavam—Canto I, Verses1 to 10

(c) Kiratarjuniyaue—Canto I, Verses 1 to 10

Group 2 (a) Isavasyopanisad—Verses—1, 2, 4, 6, 7, 15 and 18

(b) Bhagavatgita II Chapter Verses13 to 25

(c) Sundarakandam of Valmiki Canto15, Verses 15 to 30 (Geeta Press Edition)

Group 3 (a) Meghadutam—Verses 1 to 10

(b) Nitisatakam—Verses 1 to 10 (Edited by D.D. Kosambi Bharatiya Vidya Bhavan Publication)

(c) Kadambari—Sukanasopadesa (only)

Group 4 (a) Svapnavasavadattam Act VI

(b) Abhijnansakuntalam Act IV Verses 15 to 30 (M.R. Kale Edition)

(c) Uttararamacaritam Act I Verses 31 to 47 (M.R. Kale Edition).

SANTHALI

PAPER I

(Answers must be written in Santhali)

Section A

Part I—History of Santhali Language

(Novelist)	Pavittar Papi	
	Ek Mian Do Talwaran	
(c) Gurbaksh Singh	Zindagi-di-Ras	
(Essayist)	Nawan Shivala	
	Merian Abhul Yadaan.	
Balraj Sahni	Mera Roosi Safarnama	
(Travelogue)	Mera Pakistani Safarnama	
(d) Balwant Gargi	Loha Kutt	
(Dramatist)	Dhuni-di-Agg	
	Sultan Razia	
Sant Singh Sekhon	Sahityarth	
(Critic)	Parsidh Punjabi Kavi	
	Punjabi Kav Shiromani.	

SANSKRIT

PAPER-I

There will be three questions as indicated in the Question Paper which must be answered in Sanskrit. The Remaining questions must be answered either in Sanskrit or in the medium of examination opted by the candidate.

Section A

1. Significant features of the grammar, with particular stress on Sanjna, Sandhi, Karaka, Samasa, Kartari and Karmani vacyas (voice usages) (to be answered in Sanskrit).

2.(a) Main characteristics of Vedic Sanskrit language

(b) Prominent feature of classical Sanskrit language

(c) Contribution of Sanskrit to linguistic studies

3. General Knowledge of :—

(a) Literary history of Sanskrit

(b) Principal trends of literary criticism

(c) Ramayana

(d) Mahabharata

(e) The origin and development of literary geners of :

Mahakavya

Rupaka (drama)

Katha

Akhyayika

Campu

Khandakavya

Muktaka Kavya.

Section B

4. Essential of Indian Culture with stress on :

(a) Purusārthas

(b) Samskāras

(c) Varnāsramavyavasthā

(d) Arts and fine arts

(e) Technical Sciences.

5. Trends of Indian Philosophy

(a) Mīmansā

(b) Vedānta

(c) Nyaya

(d) Vaisesika

(e) Sānkhya

(f) Yoga

(g) Bauddha

(h) Jaina

(i) Carvāka

6. Short Essay (in Sanskrit)

7. Unseen passage with the questions (to be answered in Sanskrit).

PAPER-II

Question from Group 4 is to be answered in Sanskrit only. Questions from Groups 1, 2 and 3 are to be answered either in Sanskrit or in the medium opted by the candidate.

Section A

General study of the following groups :—

Group 1

(a) Raghuvamsam—Kalidasa

(b) Kumarasambhavam—Kalidasa

(c) Kiratarjuniyam—Bharavi

(d) Sisupalavadham—Magha

(e) Naisadhiyacaritam—Sriharsa

(f) Kadambari—Banabhatta

(g) Dasakumaracaritam—Dandin

(h) Sivarajyodayam—S.B. Varnekar

Group 2

(a) Isāvāsyopanisad

(b) Bhagavadgitā

(c) Sundarakanda of Valmiki's Ramayana

(d) Arthasastra of Kautilya

Group 3

(a) Svapanavasavadattam—Bhasa

(b) Abhijnanasakuntalam—Kalidasa

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

18-19

DEPARTMENT OF SANSKRIT

Units of MODULE –I SEMESTER-I 2018-2019

COURSE CODE :SAN101

Selected from the text book "Saraswatisushama-I" as prescribed by Osmania university.

Unit - 1

1.Mudabhishektum varada tvamarhasi - Valmiki

(6th canto of Ayodhya kanda , Srimadramayanam)

Objectives : Study of the poet, srimadramayanam, essay & annotations

2. Himalayo nama nagadhirajah- Kalidasa

Objectives: Study of the poet, works, word to word meaning with translation, essay and annotations

Unit - 2

3.Dharmabaddho Dauvarikah–

Ambikadattavyasah

(Selected from Shivarajavijayah)

Objectives: Study of the poet, works, essay & annotations

4.Kritaghne nasty nishkritih - Vishnusharma

(Selected from Panchatantra)

Objectives, study of the poet, work, essay & annotations

Unit – 3

5.Avantu bharataprajah svatantrabharataprabham - Sri Bhashyam Vijayasarathi

Objectives: Study of the poet, works, essay & annotations

6.Esha dharma sanatanah – Subhashitani

Objectives: Study of Subhashitas for practical exam

Unit – 4

7.AjantaSabdah - from prescribed text

8.Samskrutasambhashanabhyasah - Nirdaritasamvadah

Unit – 5

9.Sandhayah - from prescribed text

10.Samskrutasambhashanabhyasah - Nirdaritasamvadah

SYLLABUS

Units of MODULE –II SEMESTER-I 2018-2019

COURSE CODE :SAN201

Selected from the text book "Saraswatisushama-I" as prescribed by Osmania university.

Unit - 1

1.Sastuprasthasya mahattvam - Vedavyasah

(90th adhyaya of Ashvamedhikaparva , Mahabharatam)

Objectives : Study about the poet, Mahabharatam, essay & annotations

2. Buddhasyah vairagyodayah- Ashvaghoshah

Objectives: Study about the poet, works, word to word meaning with translation, essay and annotations

Unit - 2

3.Vaijnanaika (Brihat) Samhita– Pullela SriRamachandrudu

(Selected from Vaijnanikasamhita)

Objectives: Study about the poet, works, essay & annotations

4.Na Gangadattah punareti kupam Vishnusharma

(Selected from Panchatantra)

Objectives, study about the poet, work, essay & annotations

Unit – 3

5.Daivasurasampadvibhagayogah – Vedavyasa

Objectives: Study about Bhagavadgita, essay & annotations

Unit – 4

6.Dhatavah - from prescribed text

Unit – 5

7.Samasah - from prescribed text

SYLLABUS

Units of MODULE –III SEMESTER-III 2018-2019

COURSE CODE :SAN301

Selected from the text book "Saraswatisushama-II" as prescribed by Osmania university.

Unit – 1

1.Pravaratatam Prakritihitaya parthivah - Kalidasa

7th Act of Abhijnanashakuntalam

Objectives : Study about the poet, Abhijnanashakuntalam, word to word meaning with translation, essay & annotations

Unit - 2

2.Sudrakavaishampayanayoh sambhashanam – Banabhatta

Selected from Kadambari

Objectives: Study about the poet, works, essay & annotations

3.Ramadasah - Sannidhanam Suryanarayana Shastri

Objectives, study of the poet, works, essay & annotations

Unit – 3

4.Shishyanushasanam - Taittiriyopanishat

Objectives: Study about Upanishads, essay & annotations

5.Brahmashaktirgariyasi – Kenopanishat

Objectives: Study about Upanishads, essay & annotations

Unit – 4

6.**Mahakavishastrakaravibhagah** - from prescribed text

7.Alankarah - from prescribed text

Unit – 5

8.Halantasabdarupani - Nidaritasabdah

Units of MODULE –IV SEMESTER-IV 2018-2019

COURSE CODE :SAN401

Selected from the text book "Saraswatisushama-II" as prescribed by Osmania university.

Unit – 1

1. Chitrapatadarshanam - Bhavabhuti

Ist Act of Uttararamacaritam

Objectives: Study of the poet, his works, selected verses translation essay and annotations

2. Vivekananda vijaye Ashtamonkah – Sridharabhaskaravarnekarah

Objectives: Study of the Poet, his works, essay & annotations

Unit – 2

3.Vishrutacaritam - Dandin

Objectives: Study of the Poet, his works, essay & annotations

4.Dhruvopakhyanam - P.V.Kane

Objectives: Study of the Poet, his works, essay & annotations

Unit – 3

5. Dakarakatha - Brihadaranyakopanishat

6.Nachiketopakhyanam - Kathopanishat

Objectives: Study of Upanishads, essay and annotations

Unit – 4

7.Mahakavishastrakaravibhagah - from prescribed text

8.Alankarah - from prescribed text

Unit - 5

9. Krudantaupani - Nirdaritapratyayah

From prescribed grammar part of the text

10.Samskrutasambhashanabhyasah - Nirdaritasamvadah

(iv) Saurashtrani Rasdhar-Part 1—ZAVERCHAND MEGHANI

(v) Manvini Bhavai—PANNALAL PATEL

(vi) Dhvani—RAJENDRA SHAH

2. **Adhunik yug**

(vii) Saptapadi—UMASHANKAR JOSHI

(viii) Janantike—SURESH JOSHI

(ix) Ashwatthama—SITANSHU YASHASCHANDRA.

HINDI

PAPER I

(Answers must be written in Hindi)

Section A

1. History of Hindi Language and Nagari Lipi

I. Grammatical and applied forms of Apbhransh, Awahatta & Arambhik Hindi.

II. Development of Braj and Awadhi as Literary language during medieval period.

III. Early form of Khari-boli in Siddha-Nath Sahitya, Khusero, Sant Sahitaya, Rahim etc. and Dakhni Hindi.

IV. Development of Khari-boli and Nagari Lipi during 19th Century.

V. Standardisation of Hindi Bhasha & Nagari Lipi.

VI. Development of Hindi as a National Language during freedom movement.

VII. The development of Hindi as a National Language of Union of India.

VIII. Scientific & Technical Development of Hindi Language.

IX. Prominent dialects of Hindi and their inter-relationship.

X. Salient features of Nagari Lipi and the efforts for its reform & Standard form of Hindi.

XI. Grammatical structure of Standard Hindi.

Section B

2. History of Hindi Literature

I. The relevance and importance of Hindi literature and tradition of writing History of Hindi Literature.

II. Literary trends of the following four periods of history of Hindi Literature.

A : Adikal—Sidh, Nath and Raso Sahitya.
Prominent poets—Chandvardai, Khusaro, Hemchandra, Vidyapati.

B : Bhaktikal—Sant Kavyadhara, Sufi Kavyadhara, Krishna Bhaktidhara and Ram Bhaktidhara.

Prominent Poets—Kabir, Jayasi, Sur & Tulsi.

C : Ritikal—Ritikavya, Ritibaddhkavya & Riti Mukta Kavya. Prominent Poets—Keshav, Bihari, Padmakar and Ghananand.

D : Adhunik Kal—

a. Renaissance, the development of Prose, Bharatendu Mandal.

b. Prominent Writers—Bharatendu, Bal Krishna Bhatt & Pratap Narain Mishra.

c. Prominent trends of modern Hindi Poetry: Chhayavad, Pragativad, Prayogvad, Nai Kavita, Navgeet and Contemporary poetry and Janvadi Kavita.

Prominent Poets—Maithili Sharan Gupta, Prasad, Nirala, Mahadevi, Dinkar, Agyeya, Muktibodh, Nagarjun.

3. Katha Sahitya

B

A : Upanyas & Realism

B : The origin and development of Hindi Novels.

C : ProminentNovelists—Premchand, Jain-endra, Yashpal, Renu and Bhism Sahani.

D : The origin and development of Hindi short story.

E : Prominent Short Story Writers—Premchand, Prasad, Agyeya, Mohan Rakesh & Krishna Sobti.

4. Drama & Theatre

A : The Origin & Development of Hindi Drama.

B : Prominent Dramatists—Bharatendu, Prasad, Jagdish Chandra Mathur, Ram Kumar Verma, Mohan Rakesh.

C : The development of Hindi Theatre.

5. Criticism

A : The origin and development of Hindi criticism : Saiddhantik, Vyavharik, Pragativadi. Manovishleshanvadi & Nai Alochana.

B : Prominent critics—Ramchandra Shukla, Hajari Prasad Dwivedi, Ram Vilas Sharma & Nagendra.

6. The other form of Hindi prose—Lalit Nibandh,Rekhachitra, Sansmaran, Yatra-vrittant.

PAPER II

(Answers must be written in Hindi)

The paper will require first-hand reading of the prescribed texts and will test the critical ability of the candidates.

Section A

10 sakhis

1. Kabir : Kabir Granthawali, Ed. Shyam Sundar Das (First hundred Sakhis)
2. Soordas : Bhramar Geetsar, Ed. Ramchandra Shukla (First hundred Padas) 3 padas
3. Tulsidas : Ramcharit Manas (Sundar Kand) Kavitawali (Uttarkand) 10 dohas
4. Jayasi : Padmawat Ed. Shyam Sundar Das (Sinhal Dwip Khand & Nagmativiyog Khand)
5. Bihari : Bihari Ratnakar Ed. Jagnnath Prasad Ratnakar (First 100 Dohas) 10 Dohas
6. Maithili Sharan Gupta : Bharat Bharati one poem

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

7. Prasad : Kamayani (Chinta and Shraddha Sarg)
8. Nirala : Rag-Virag, Ed. Ram Vilas Sharma (Ram Ki Shakti Pooja & Kukurmutta)
9. Dinkar : Kurukshetra
10. Agyeya : Angan Ke Par Dwar (Asadhya Veena)
11. Muktiboth : Brahm Rakhashas
12. Nagarjun : Badal Ko Ghirte Dekha Hai, Akal Ke Bad, Harijan Gatha.

Section B

1. Bharatendu : Bharat Durdasha
2. Mohan Rakesh : Ashadh Ka Ek Din
3. Ramchandra : Chintamani (Part I) (KavitaKya Shukla Hai, ShraddhaAurBhakti)
4. Dr. Satyendra : Nibandh Nilaya—Bal Krishna Bhatt, Premchand, Gulab Rai, Hajari Prasad Dwivedi, Ram Vilas Sharma, Agyeya, Kuber Nath Rai.
5. Premchand : Godan, Premchand ki Sarvashreshtha Kahaniyan, Ed. Amrit Rai/Manjusha—Prem Chand ki Sarvashreshtha Kahaniyan. Ed. Amrit Rai.
6. Prasad : Skandgupta
7. Yashpal : Divya
8. Phaniswar Nath : Maila Anchal
   Renu
9. Mannu Bhandari : Mahabhoj
10. Rajendra Yadav : Ek Dunia Samanantar (All Stories)

KANNADA

PAPER-I

(Answers must be written in Kannada)

Section A

A. **History of Kannada Language**

What is Language ? General characteristics of Language. Dravidian Family of Languages and its specific features. Antiquity of Kannada Language. Different phases of its Development.

Dialects of Kannada Language : Regional and Social. Various aspects of developments of Kannada Language: phonological and Semantic changes. Language borrowing.

B. **History of Kannada Literature**

Ancient Kannada literature : Influence and Trends, Poets for study : Specified poets from Pampa to Ratnakara Varni are to be studied in the light of contents, form and expression : Pampa, Janna, Nagachandra.

Medieval Kannada literature : Influence and Trends.

Vachana Literature : Basavanna, Akka Mahadevi.

GOVERNMENT DEGREE COLLEGE FOR WOMEN

BEGUMPET, HYDERABAD

AUTONOMOUS

NAAC ACCREDITED 'B'

Syllabus for B.A., B.Com., B.Sc., I Semester

Subject : Second language Hindi

I. गद्य दर्पण

1. उत्साह - रामचंद्र शुक्ल
2. चरित्र-संगठन - बाबू गुलाब राय
3. बाजार दर्शन - जैनेंद्र कुमार
4. भाभी - महादेवी वर्मा
5. भारत में संस्कृति संगम - रामधारी सिंह दिनकर

II. कथा सिंधु (उपवाचक)

1. सद्गति - प्रेमचंद
2. छोटा जादूगर - जयशंकर प्रसाद
3. प्रायश्चित्त - [illegible] भगवती चरण वर्मा
4. पर्दा - यशपाल
5. चीफ़ की दावत - भीष्म साहनी

III. शब्दों से वाक्य बनाइए।

वाच्य बदलिए।

काल परिवर्तन कीजिए।

IV. प्रशासनिक शब्दावली का

अंग्रेजी से हिंदी में अनुवाद कीजिए।

पदनाम का

हिंदी से अंग्रेजी में अनुवाद कीजिए।

Internal Assessment porsion

वस्तुनिष्ठ प्रश्न

रिक्त स्थानों की पूर्ति

दीर्घ प्रश्न, व्याकरण - लिंग, वचन, कारक, वाक्य शुद्ध कीजिए

(गद्य दर्पण और कथा सिंधु में से)

P. JYOTHI SHEELA NAYAK
CHAIRPERSON
BOARD OF STUDIES
Department of Hindi
University,
007. T.S. India.

DEAN,
Faculty of Arts
B.R. AMBEDKAR OPEN UNIVERSITY
HYDERABAD - 500 481

D. PARVATI
Assistant Professor
Dept. of Hindi, Telangana University
Dichpally, Nizamabad-503 322. (T.S.)

GOVERNMENT DEGREE COLLEGE FOR WOMEN

BEGUMPET, HYDERABAD

AUTONOMOUS

NAAC ACCREDITED 'B'

Syllabus for B.A., B.Com., B.Sc., Ist Year II Semester

Subject : Second language Hindi

I. Prose-गद्य दर्पण

1. धरती का स्वर्ग - विष्णु प्रभाकर
2. अण्डे के छिलके - मोहन राकेश
3. राजनीति का बँटवारा - हरिशंकर परसाई
4. स्वामी विवेकानंद - वंशीधर विद्यालंकार
5. पर्यावरण और हम - राजीव गर्ग

II. Non-detail

1. डिप्टी कलेक्टरी - अमरकांत
2. हँसू या रोऊँ - विनायक राव विद्यालंकार
3. वापसी - उषा प्रियंवदा
4. सेवा - ममता कालिया
5. सिलिया - सुशीला टाकभौरे

पत्र लेखन

विलोम शब्द

संधि विच्छेद

Internal Assessment (From prose & Non detail)

(गद्य दर्पण और कथा सिंधु में से)

वस्तु निष्ठ प्रश्न

दीर्घ प्रश्न

रिक्त स्थानों की पूर्ति कीजिए।

विलोम शब्द, संधि-विच्छेद

Prof. SHEELA MISRA
CHAIRPERSON
BOARD OF STUDIES
Department of Hindi
Osmania University,
Hyderabad-500 007. T.S. India

DEAN
Faculty of Arts
Dr. B.R. AMBEDKAR OPEN UNIVERSITY
HYDERABAD – 500 482

Dr. PARVATI
Assistant Professor
Dept. of Hindi, Telangana University
Nizamabad-503 322. (T.S.)

Government Degree College for Women (Autonomous)
Begumpet, Hyderabad - 16
Affiliated to Osmania University, Re-Accredited with 'B' Grade by NAAC

SYALLABUS FOR

B.A., B.Com., B.Sc., Third Semester Hindi Second Language

Osmania University W.ef. 2018-2019

First Unit - KAVYA NIDHI

1. Kabeer Das — Kabeer ke dohe
2. Soor Das — Baal Leela
3. Tulasi Das — Tulasi Das ke dohe

Second Unit - KAVYA NIDHI

1. Maithilisharan Gupt — Navayuvakon se
2. Ayodhya singh Upadhyaya 'Harioudh' — Phool aur kaanta
3. Jai Shankar Prasad — Bharat

Third Unit - KAVYA NIDHI

1. Sumitranandan Pant — Jeewan ka adhikar
2. Subhadra kumari Chauhan — Mera nayaa Bachpan

Fourth Unit

Hindi Sahitya ka Itihas : Main tendencies of the following ages :

1) Aadi kaal : Naamkaran, Paristhitiyaan, Pravrittiyaan
2) Bhakti kaal : Naamkaran, Paristhitiyaan, Pravrittiyaan

} In semester examinatio questions will be on Pravi

Hindi Sahitya ka Itihas : Brief study of the following authors and poets -

Chand Bardaai
Kabeer Das
Soor Das
Tulasi Das
Jai Shankar Prasad
Sumitranandan Pant
Bharatendu Harishchandra
Maithilisharan Gupt
Ramdhari singh 'Dinkar'

Fifth Unit

General Essay on Socio-political and Literary subjects :

Sahitya aur Samaaj
Vidyaarthi aur Rajneeti
Vigyaan : Vardaan yaa abhishaap
Samaaj mein naari kaa sthaan
Adhunik Shikshaa aur Naari
Shikshaa par Bhoomandalikaran kaa prabhaav
Jeewan mein swachchataa kaa mahatva

Translation from English or Telugu to Hindi : Kept for Internal Assessment

-: Reference books :-

- Hindi Sahitya kaa Ithihas - Professor T. Mohan Singh
- Hindi Sahitya kaa Sankshipt Ithihas - Dr. Vidyasagar Dayal
- Hindi Sahitya kaa Sankshipt Ithihas - Dr. Tej Narayan Jaiswal
- Hindi Sahitya kaa Subodh Ithihas - Gulab Rai

DEAN, Faculty of Arts, B.R. AMBEDKAR OPEN UNIVERSITY, HYDERABAD - 500 482

Prof. SHEELA MISRA
CHAIRPERSON
BOARD OF STUDIES
Department of Hindi
Osmania University
Hyderabad-500 007. T.S. India

DR. PARVATI

Government Degree College for Women (Auto) ...
Begumpet, Hyderabad -16
Affiliated to Osmania University, Re-Accredited with 'B' Grade by NAAC

SYALLABUS FOR

B.A., B.Com., B.Sc., Fourth Semester Hindi Second Language

Osmania University W.ef. 2018-2019

First Unit - KAVYA NIDHI

Meera ke pad
Raheem ke dohe
Bihari ke dohe

Second Unit - KAVYA NIDHI

Bhagwan Buddh ke prati
Ve muskaate phool nahin
Kalam aur Talwaar

Third Unit - KAVYA NIDHI

To kyon baith gayaa hai path par
Anubhav paripakva

Fourth Unit

Hindi Sahitya ka Itihas : Main tendencies of the following ages :
Shringaar Kaal : Naamkaran, Paristhitiyaan, Pravrittiyaan } In semester examination Questions will be on Prarrittiyaan
Aadhunik Kaal :
Bhartendu Yug, Dwivedi Yug, Chchyaawaad, Pragatiwaad, Prayogwaad.
Hindi Gadya kaa vikaas, Hindi Kahaani, Upanyaas aur Naatak.

Brief study of the following authors and poets :

Meera Bai
Maithilisharan Gupt — Raheem — Bihaari
Jaishankar Prasad — Premchand — Nirala
Mahadevi Varma — Harivansh Rai Bachchan — Agyeya

Fifth Unit

Essays on General topics :
Bhrashtaachaar aur Anushaasan
Nai Shiksha neeti
Bharat mein Beroazgaari ki samasyaa
Paryaavaran aur Pradooshan
Bharat mein badhati huyi jan sankhyaa
Bhartiya sanskriti

Recommendation : - अति उत्तम उपयोगी - Kant...

Prof. SHEELA MISRA
CHAIRPERSON
BOARD OF STUDIES
Department of Hindi
Osmania University
Hyderabad-500 007

DEAN,
Faculty of Arts
Dr. B.R. AMBEDKAR OPEN UNIVERSITY
HYDERABAD - 500 481

Dr. PARVATI
Assistant Professor
Dept. of Hindi, Telangana University
Dichpally, Nizamabad-503322

2018-19

Concept of core competence, Strategic flexibility; Reinventing strategy; Strategy and structure; chief Executive and Board; turnaround management; Management of strategic change; Strategic alliances, Mergers and Acquisitions; Strategy and corporate evolution in the Indian context.

6. International Business :

International Business Environment : Changing composition of trade in goods and services; India's Foreign Trade: Policy and trends; Financing of International trade; Regional Economic Cooperation; FTAs; Internationalisation of service firms; International production; Operation Management in International companies; International Taxation; Global competitiveness and technological developments; Global E-Business; Designing global organisational structure and control; Multicultural management; Global business strategy; Global marketing strategies; Export Management; Export-Import procedures; Joint Ventures; Foreign Investment: Foreign direct investment and foreign portfolio investment; Cross-border Mergers and Acquisitions; Foreign Exchange Risk Exposure Management; World Financial Markets and International Banking; External Debt Management; Country Risk Analysis.

MATHEMATICS

PAPER I

(1) Linear Algebra :

Vector spaces over R and C, linear dependence and independence, subspaces, bases, dimensions, Linear transformations, rank and nullity, matrix of a linear transformation.

Algebra of Matrices; Row and column reduction, Echelon form, congruence's and similarity; Rankof a matrix; Inverse of a matrix; Solution of system of linear equations; Eigenvalues and eigenvectors, characteristic polynomial, Cayley-Hamilton theorem, Symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal and unitary matrices and their eigenvalues.

(2) Calculus :

Real numbers, functions of a real variable, limits, continuity, differentiability, mean-value theorem, Taylor's theorem with remainders, indeterminate forms, maxima and minima, asymptotes; Curve tracing; Functions of two or three variables; Limits, continuity, partial derivatives, maxima and minima, Lagrange's method of multipliers, Jacobian.

Riemann's definition of definite integrals; Indefinite integrals; Infinite and improper integral; Double and triple integrals (evaluation techniques only); Areas, surface and volumes.

(3) Analytic Geometry :

Cartesian and polar coordinates in three dimensions, second degree equations in three variables, reduction to Canonical forms; straight lines, shortest distance between two skew lines, Plane, sphere, cone, cylinder, paraboloid, ellipsoid, hyperboloid of one and two sheets and their properties.

(4) Ordinary Differential Equations :

Formulation of differential equations; Equations of first order and first degree, integrating factor; Orthogonal trajectory; Equations of first order but not of first degree, Clairaut's equation, singular solution.

Second and higher order liner equations with constant coefficients, complementary function, particular integral and general solution.

Section order linear equations with variable coefficients, Euler-Cauchy equation;

Determination of complete solution when one solution is known using method of variation of parameters.

Laplace and Inverse Laplace transforms and their properties, Laplace transforms of elementary functions. Application to initial value problems for 2nd order linear equations with constant coefficients.

(5) Dynamics and Statics :

Rectilinear motion, simple harmonic motion, motion in a plane, projectiles; Constrained motion; Work and energy, conservation of energy; Kepler's laws, orbits under central forces.

Equilibrium of a system of particles; Work and potential energy, friction, Common catenary; Principle of virtual work; Stability of equilibrium, equilibrium of forces in three dimensions.

(6) Vector Analysis :

Scalar and vector fields, differentiation of vector field of a scalar variable; Gradient, divergence and curl in cartesian and cylindricai coordinates; Higher order derivatives; Vector identities and vector equation.

Application to geometry : Curves in space, curvature and torsion; Serret-Furenet's formulae.

Gauss and Stokes' theorems, Green's indentities.

PAPER II

(1) Algebra :

Groups, subgroups, cyclic groups, cosets, Lagrange's Theorem, normal subgroups, quotient groups, homomorphism of groups, basic isomorphism theorems, permutation groups, Cayley's theorem.

Rings, subrings and ideals, homomorphisms of rings; Integral domains, principal ideal domains, Euclidean domains and unique factorization domains; Fields, quotient fields.

(2) Real Analysis :

Real number system as an ordered field with least upper bound property; Sequences, limit of a sequence, Cauchy sequence, completeness of real line; Series and its convergence, absolute and conditional convergence of series of real and complex terms, rearrangement of series. Continuity and uniform continuity of functions, properties of continuous functions on compact sets.

Riemann integral, improper integrals; Fundamental theorems of integral calculus.

Uniform convergence, continuity, differentiability and integrability for sequences and series of functions; Partial derivatives of functions of several (two or three) variables, maxima and minima.

(3) Complex Analysis :

Analytic function, Cauchy-Riemann equations, Cauchy's theorem, Cauchy's integral formula, power series, representation of an analytic function, Taylor's series; Singularities; Laurent's series; Cauchy's residue theorem; Contour integration.

(4) Linear Programming :

Linear programming problems, basic solution, basic feasible solution and optimal solution; Graphical method and simplex method of solutions; Duality.

Transportation and assignment problems.

(5) Partial Differential Equations :

Family of surfaces in three dimensions and formulation of partial differential equations; Solution of quasilinear partial differential equations of the first order, Cauchy's method of characteristics; Linear partial differential equations of the second order with constant coefficients, canonical form; Equation of a vibrating string, heat equation, Laplace equation and their solutions.

(6) Numerical Analysis and Computer Programming :

Numerical methods: Solution of algebraic and transcendental equations of one variable by bisection, Regula-Falsi and Newton-Raphson methods, solution of system of linear equations by Gaussian Elimination and Gauss-Jorden (direct), Gauss-Seidel (iterative) methods. Newton's (forward and backward) and interpolation, Lagrange's interpolation.

Numerical integration: Trapezoidal rule, Simpson's rule, Gaussian quadrature formula.

Numerical solution of ordinary differential equations : Eular and Runga Kutta methods.

Computer Programming : Binary system; Arithmetic and logical operations on numbers; Octal and Hexadecimal Systems; Conversion to and from decimal Systems; Algebra of binary numbers.

Elements of computer systems and concept of memory; Basic logic gates and truth tables, Boolean algebra, normal forms.

Representation of unsigned integers, signed integers and reals, double precision reals and long integers.

Algorithms and flow charts for solving numerical analysis problems.

(7) Mechanics and Fluid Dynamics :

Generalised coordinates; D'Alembert's principle and Lagrange's equations; Hamilton equations; Moment of inertia; Motion of rigid bodies in two dimensions.

Equation of continuity; Euler's equation of motion for inviscid flow; Stream-lines, path of a particle; Potential flow; Two-dimensional and axisymmetric motion; Sources and sinks, vortex motion; Navier-Stokes equation for a viscous fluid.

MECHANICAL ENGINEERING

PAPER I

1. Mechanics :

1.1 Mechanics of Rigid Bodies :

Equations of equilibrium in space and its application; first and second moments of area; simple problems on friction; kinematics of particles for plane motion; elementary particle dynamics.

1.2 Mechanics of Deformable Bodies :

Generalized Hooke's law and its application; design problems on axial stress, shear stress and bearing stress; material properties for dynamic loading; bending shear and stresses in beams; determination of principle stresses and strains-analytical and graphical; compound and combined stresses; bi-axial stresses-thin walled pressure vessel; material behaviour and design factors for dynamic load; design of circular shafts for bending and torsional load only; deflection of beam for statically determinate problems; theories of failure.

2.Engineering Materials :

2018-19

2.1 Differential Calculus

DSC-1A **BS:10**

Theory: 4 credits and Practicals: 1 credits
Theory: 4 hours /week and Practicals: 2 hours /week

Objective: The course is aimed at exposing the students to some basic notions in differential calculus.
Outcome: By the time students completes the course they realize wide ranging applications of the subject.

Unit- I

Successive differentiation- Expansions of Functions- Mean value theorems

Unit- II

Indeterminate forms - Curvature and Evolutes

Unit- III

Partial differentiation - Homogeneous functions- Total derivative.

Unit- IV

Maxima and Minima of functions of two variables – Lagrange's Method of multipliers –Asymptotes- Envelopes.

Text:

- Shanti Narayan and Mittal, *Differential Calculus*

References:

- William Anthony Granville, Percey F Smith and William Raymond Longley; *Elements of the differential and integral calculus*
- Joseph Edwards , *Differential calculus for beginners* 80-100
- Smith and Minton. *Calculus* —— 1450 – (1)
- Elis Pine, *How to Enjoy Calculus*
- Hari Kishan. *Differential Calculus* — 350

2.2 Differential Equations

DSC-1B **BS:204**

Theory: 4 credits and Practicals: 1 credits
Theory: 4 hours /week and Practicals: 2 hours /week

Objective: The main aim of this course is to introduce the students to the techniques of solving differential equations and to train to apply their skills in solving some of the problems of engineering and science.
Outcome: After learning the course the students will be equipped with the various tools to solve few types differential equations that arise in several branches of science.

Unit- I

Differential Equations of first order and first degree: Exact differential equations - Integrating Factors - Change in variables - Total Differential Equations - Simultaneous Total Differential Equations - Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$. Differential Equations first order but not of first degree: Equations Solvable for y - Equations Solvable for x - Equations that do not contain x (or y)- Clairaut's equation.

Unit- II

Higher order linear differential equations: Solution of homogeneous linear differential equations with constant coefficients - Solution of non-homogeneous differential equations $P(D)y = Q(x)$ with constant coefficients by means of polynomial operators when $Q(x) = be^{ax}, b\sin ax/b\cos ax, bx^k, Ve^{ax}$.

Unit- III

Method of undetermined coefficients - Method of variation of parameters - Linear differential equations with non constant coefficients - The Cauchy - Euler Equation.

Unit- IV

Partial Differential equations- Formation and solution- Equations easily integrable - Linear equations of first order - Non linear equations of first order - Charpit's method - Homogeneous linear partial differential equations with constant coefficient - Non homogeneous linear partial differential equations - Separation of variables.

Text:

- Zafar Ahsan, *Differential Equations and Their Applications*

2.3 Logic and Sets

SEC-1A

BS:301

Credits: 2
Theory : 2 hours/week

Objective: Students learn some concepts in set theory and logic.
Outcome: After the completion of the course students appreciate its importance in the development of computer science.

Unit- I

Basic Connectives and truth tables - Logical equivalence : Laws of Logic - Logical Implication : Rules Inference : The Use of Quantifiers - Quantifiers, Definitions, and proofs of Theorems.

Unit- II

Sets and Subsets - Set Operations and the Laws of Set Theory - Counting and Venn Diagrams - A First Word on Probability - The axioms of Probability - Conditional Probability: Independence - Discrete Random variables .

Text:

- Ralph P Grimaldi, *Discrete and Combinatorial Mathematics* (5e)

References:

- P R Halmos. *Naive Set Theory*
- E Kamke . *Theory of Sets*

2.5 Real Analysis

DSC-1C **BS:304**

Theory: 4 credits and Practicals: 1 credits
Theory: 4 hours /week and Practicals: 2 hours /week

Objective: The course is aimed at exposing the students to the foundations of analysis which will be useful in understanding various physical phenomena.
Outcome: After the completion of the course students will be in a position to appreciate beauty and applicability of the course.

Unit- I

Sequences: Limits of Sequences- A Discussion about Proofs-Limit Theorems for Sequences-Monotone Sequences and Cauchy Sequences.

Unit- II

Subsequences-Lim sup's and Liin inf's-Series-Alternating Series and Integral Tests .

Unit- III

Sequences and Series of Functions: Power Series-Uniform Convergence-More on Uniform Convergence-Differentiation and Integration of Power Series (Theorems in this section without Proofs).

Unit- IV

Integration : The Riemann Integral - Properties of Riemann Integral-Fundamental Theorem of Calculus.

Text:

- Kenneth A Ross, *Elementary Analysis-The Theory of Calculus*

References:

- William F. Trench, *Introduction to Real Analysis*
- Lee Larson , *Introduction to Real Analysis I*
- Shanti Narayan and Mittal, *Mathematical Analysis*
- Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner; *Elementary Real analysis*
- Sudhir R., Ghorpade, Balmohan V., Limaye; *A Course in Calculus and Real Analysis*

2.6 Transportation and Game Theory

SEC-2C **BS:401**

Credits: 2
Theory: 2 hours /week

Objective: Students learn Transportation problem, assignment problem Games with mixed strategies.
Outcome: Students come to know about nice applications of Operations Research.

Unit- I

The Transportation and Assignment Problems : The Transportation Problem - A Streamlined Simplex Method for the Transportation Problem - The Assignment Problem.

Unit- II

Game Theory: The Formulation of Two-Person, Zero-Sum Games - Solving Simple Games—A Prototype Example - Games with Mixed Strategies - Graphical Solution Procedure - Solving by Linear Programming - Extensions.

Text:

- Frederick S Hillier and Gerald J Lieberman, *An Elementary Introduction to Operations Research (9e)*

References:

- Hamdy A Taha , *Operations Research :An introduction*
- Gupta and Kapur , *Operations Research*

2.8 Algebra

DSC-1D **BS:404**

Theory: 4 credits and Practicals: 1 credits
Theory: 4 hours /week and Practicals: 2 hours /week

Objective: The course is aimed at exposing the students to learn some basic algebraic structures like groups, rings etc.

Outcome: On successful completion of the course students will be able to recognise algebraic structures that arise in matrix algebra, linear algebra and will be able to apply the skills learnt in understanding various such subjects.

Unit- I

Groups: Definition and Examples of Groups- Elementary Properties of Groups-Finite Groups; Subgroups -Terminology and Notation -Subgroup Tests - Examples of Subgroups Cyclic Groups: Properties of Cyclic Groups - Classification of Subgroups Cyclic Groups-Permutation Groups: Definition and Notation -Cycle Notation-Properties of Permutations -A Check Digit Scheme Based on D_5.

Unit- II

Isomorphisms ; Motivation- Definition and Examples -Cayley's Theorem Properties of Isomorphisms -Automorphisms-Cosets and Lagrange's Theorem Properties of Cosets 138 - Lagrange's Theorem and Consequences-An Application of Cosets to Permutation Groups -The Rotation Group of a Cube and a Soccer Ball -Normal Subgroups and Factor Groups ; Normal Subgroups-Factor Groups -Applications of Factor Groups -Group Homomorphisms - Definition and Examples -Properties of Homomorphisms -The First Isomorphism Theorem.

Unit- III

Introduction to Rings: Motivation and Definition -Examples of Rings -Properties of Rings -Subrings -Integral Domains : Definition and Examples -Characteristics of a Ring -Ideals and Factor Rings: Ideals -Factor Rings -Prime Ideals and Maximal Ideals.

Unit- IV

Ring Homomorphisms: Definition and Examples-Properties of Ring- Homomorphisms -The Field of Quotients Polynomial Rings: Notation and Terminology.

Text:

- Joseph A Gallian, *Contemporary Abstract algebra (9th edition)*

Semester —

Paper – V

2.12 Linear Algebra

DSC-1E **BS:503**

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: The students are exposed to various concepts like vector spaces , bases , dimension, Eigen values etc.
Outcome: After completion this course students appreciate its interdisciplinary nature.

Unit- I

Vector Spaces : Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems -The Dimension of a Vector Space

Unit- II

Rank-Change of Basis - Eigenvalues and Eigenvectors - The Characteristic Equation

Unit- III

Diagonalization -Eigenvectors and Linear Transformations -Complex Eigenvalues - Applications to Differential Equations -Orthogonality and Least Squares : Inner Product, Length, and Orthogonality -Orthogonal Sets.

Text:

- David C Lay, *Linear Algebra and its Applications* 4e

References:

- S Lang, *Introduction to Linear Algebra*
- Gilbert Strang , *Linear Algebra and its Applications*
- Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; *Linear Algebra*
- Kuldeep Singh; *Linear Algebra*
- Sheldon Axler; *Linear Algebra Done Right*

2.13 Solid Geometry

DSE-1E/A **BS:506**

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: Students learn to describe some of the surfaces by using analytical geometry.
Outcome: Students understand the beautiful interplay between algebra and geometry.

Unit- I

Sphere: Definition-The Sphere Through Four Given Points-Equations of a Circle- Intersection of a Sphere and a Line-Equation of a Tangent Plane-Angle of Intersection of Two Spheres-Radical Plane.

Unit- II

Cones and Cylinders: Definition-Condition that the General Equation of second degree Represents a Cone-Cone and a Plane through its Vertex -Intersection of a Line with a Cone- The Right Circular Cone-The Cylinder- The Right Circular Cylinder.

Unit- III

The Conicoid: The General Equation of the Second Degree-Intersection of Line with a Conicoid-Plane of contact-Enveloping Cone and Cylinder.

Text:

- Shanti Narayan and P K Mittal, *Analytical Solid Geometry* (17e)

References:

- Khaleel Ahmed, *Analytical Solid Geometry*
- S L Loney , *Solid Geometry*
- Smith and Minton, *Calculus*

2.14 Integral Calculus

DSE-1E/B **BS:506**

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: Techniques of multiple integrals will be taught.
Outcome: Students will come to know about its applications in finding areas and volumes of some solids.

Unit- I

Areas and Volumes: Double Integrals-Double Integrals over a Rectangle-Double Integrals over General Regions in the Plane-Changing the order of Integration

Unit- II

Triple Integrals: The Integrals over a Box- Elementary Regions in Space-Triple Integrals in General

Unit- III

Change of Variables: Coordinate Transformations-Change of Variables in Triple Integrals.

Text:

- Susan Jane Colley, *Vector Calculus*(4e)

References:

- Smith and Minton, *Calculus*
- Shanti Narayan and Mittal , *Integral calculus*
- Ulrich L. Rohde , G. C. Jain , Ajay K. Poddar and A. K. Ghosh; *Introduction to Integral Calculus*

2.18 Numerical Analysis

BS:603

DSC-1F

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: Students will be made to understand some methods of numerical analysis.
Outcome: Students realise the importance of the subject in solving some problems of algebra and calculus.

Unit- I

Solutions of Equations in One Variable : The Bisection Method - Fixed-Point Iteration - Newton's Method and Its Extensions - Error Analysis for Iterative Methods - Accelerating Convergence - Zeros of Polynomials and Müller's Method - Survey of Methods and Software.

Unit- II

Interpolation and Polynomial Approximation: Interpolation and the Lagrange Polynomial - Data Approximation and Neville's Method - Divided Differences - Hermite Interpolation - Cubic Spline Interpolation.

Unit- III

Numerical Differentiation and Integration: Numerical Differentiation - Richardson's Extrapolation - Elements of Numerical Integration- Composite Numerical Integration - Romberg Integration - Adaptive Quadrature Methods - Gaussian Quadrature.

Text:

- Richard L. Burden and J. Douglas Faires,*Numerical Analysis* (9e)

References:

- M K Jain, S R K Iyengar and R k Jain, *Numerical Methods for Scientific and Engineering computation*
- B.Bradie , *A Friendly introduction to Numerical Analysis*

2.19 Complex Analysis

DSE-1F/A **BS:606**

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: Analytic Functions, contour integration and calculus of residues will be introduced to the students.
Outcome: Students realise calculus of residues is one of the power tools in solvng some problems, like improper and definite integrals, effortlessly.

Unit- I

Regions in the Complex Plane - Analytic Functions - Functions of a Complex Variable - Mappings - Mappings by the Exponential Function - Limits - Theorems on Limits - Limits Involving the Point at Infinity - Continuity - Derivatives - Differentiation Formulas - Cauchy-Riemann Equations - Sufficient Conditions for Differentiability - Polar Coordinates-Harmonic Functions.
Elementary Functions: The Exponential Function - The Logarithmic Function - Brandies and Derivatives of Logarithms - Some Identities Involving Logarithms Complex Exponents - Trigonometric Functions - Hyperbolic Functions.

Unit- II

Integrals: Derivatives of Functions $w(t)$ - Definite Integrals of Functions $w(t)$ - Contours - Contour Integrals - Some Examples - Examples with Branch Cuts - Upper Bounds for Moduli of Contour Integrals -Antiderivatives.

Unit- III

Cauchy-Goursat Theorem - Proof of the Theorem - Simply Connected Domains - Multiply Connected Domains - Cauchy Integral Formula - An Extension of the Cauchy Integral Formula - Some Consequences of the Extension - Liouville's Theorem and the Fundamental Theorem of Algebra- Maximum Modulus Principle.

Text:

- James Ward Brown and Ruel V. Churchill, *Complex Variables and Applications* (8e)

References:

- Joseph Bak and Donald J Newman, *Complex analysis*
- Lars V Ahlfors , *Complex Analysis*
- S.Lang, *Complex Analysis*
- B Choudary, *The Elements Complex Analysis*

2.20 Vector Calculus

BS:606

DSE-1F/B

Theory: 3 credits and Practicals: 1 credits
Theory: 3 hours /week and Practicals: 2 hours /week

Objective: Concepts like gradient, divergence, curl and their physical relevance will be taught.
Outcome: Students realize the way vector calculus is used to addresses some of the problems of physics.

Unit- I

Line Integrals: Introductory Example : Work done against a Force-Evaluation of Line IntegralsConservative Vector Fields-Surface Integrals: Introductory Example : Flow Through a PipeEvaluation of Surface Integrals.

Unit- II

Volume Integrals: Evaluation of Volume integrals
Gradient, Divergence and Curl: Partial differentiation and Taylor series-Partial differentiationTaylor series in more than one variable-Gradient of a scalar field-Gradients, conservative fields and potentials-Physical applications of the gradient.

Unit- III

Divergence of a vector field -Physical interpretation of divergence-Laplacian of a scalar field-Curl of a vector field-Physical interpretation of curl-Relation between curl and rotation-Curl and conservative vector fields.

Text:

- P.C. Matthews, *Vector Calculus*

References:

- G.B. Thomas and R.L. Finney, *Calculus*
- H. Anton, I. Bivens and S. Davis ; *Calculus*
- Smith and Minton, *Calculus*

2018-19
P.S

15. Nyaya—Vaiesesika : Theory of Categories; Theory of Appearance; Theory of Pramana; Self, Liberation; God; Proofs for the Existence of God; Theory of Causation; Atomistic Theory of Creation.
16. Samkhya; Prakrit; Purusa; Causation; Liberation.
17. Yoga; Citta; Cittavrtti; Klesas; Samadhi; Kaivalya.
18. Mimamsa: Theory of Knowlegde.
19. Schools of Vedanta : Brahman; Isvara; Atman; Jiva; Jagat; Maya; Avida; Adhyasa; Moksa; Aprthaksiddhi; Pancavidhabheda.
20. Aurobindo: Evolution, Involution; Integral Yoga.

PAPER-II

Socio-Political Philosophy

1. Social and Political Ideals : Equality, Justice, Liberty.
2. Sovereignty : Austin, Bodin, Laski, Kautilya.
3. Individual and State : Rights; Duties and Accountability.
4. Forms of Government : Monarchy; Theocracy and Democracy.
5. Political Ideologies: Anarchism; Marxism and Socialism.
6. Humanism; Secularism; Multi-culturalism.
7. Crime and Punishment : Corruption, Mass Violence, Genocide, Capital Punishment.
8. Development and Social Progress.
9. Gender Discrimination : Female Foeticide, Land and Property Rights; Empowerment.
10. Caste Discrimination : Gandhi and Ambedkar.

Philosophy of Religion

1. Notions of God : Attributes; Relation to Man and the World. (Indian and Western).
2. Proofs for the Existence of God and their Critique (Indian and Western).
3. Problem of Evil.
4. Soul : Immortality; Rebirth and Liberation.
5. Reason, Revelation and Faith.
6. Religious Experience : Nature and Object (Indian and Western).
7. Religion without God.
8. Religion and Morality.
9. Religious Pluralism and the Problem of Absolute Truth.
10. Nature of Religious Language : Analogical and Symbolic; Cognitivist and Non-cognitive.

PHYSICS

PAPER-I

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

1. (a) **Mechanics of Particles :**

Laws of motion; conservation of energy and momentum, applications to rotating frames, centripetal and Coriolis accelerations; Motion under a central force; Conservation of angular momentum, Kepler's laws; Fields and potentials; Gravitational field and potential due to spherical bodies, Gauss and Poisson equations, gravitational self-energy; Two-body problem; Reduced mass; Rutherford scattering; Centre of mass and laboratory reference frames.

(b) Mechanics of Rigid Bodies :

System of particles; Centre of mass, angular momentum, equations of motion; Conservation theorems for energy, momentum and angular momentum; Elastic and inelastic collisions; Rigid Body; Degrees of freedom, Euler's theorem, angular velocity, angular momentum, moments of inertia, theorems of parallel and perpendicular axes, equation of motion for rotation; Molecular rotations (as rigid bodies); Di and tri-atomic molecules; Precessional motion; top, gyroscope.

(c) Mechanics of Continuous Media :

Elasticity, Hooke's law and elastic constants of isotropic solids and their inter-relation; Streamline (Laminar) flow, viscosity, Poiseuille's equation, Bernoulli's equation, Stokes' law and applications.

(d) Special Relativity :

Michelson-Morely experiment and its implications; Lorentz transformations length contraction, time dilation, addition of relativistic velocities, aberration and Doppler effect, mass-energy relation, simple applications to a decay process. Four dimensional momentum vector; Covariance of equations of physics.

2. Waves and Optics :

(a) Waves :

Simple harmonic motion, damped oscillation, forced oscillation and resonance; Beats; Stationary waves in a string; Pulses and wave packets; Phase and group velocities; Reflection and refraction from Huygens' principle.

(b) Geometrial Optics :

Laws of reflection and refraction from Fermat's principle; Matrix method in paraxial optic-thin lens formula, nodal planes, system of two thin lenses, chromatic and spherical aberrations.

(c) Interference :

Interference of light -Young's experiment, Newton's rings, interference by thin films, Michelson interferometer; Multiple beam interference and Fabry Perot interferometer.

(d) Diffraction :

Fraunhofer diffraction - single slit, double slit, diffraction grating, resolving power; Diffraction by a circular aperture and the Airy pattern; Fresnel diffraction: half-period zones and zone plates, circular aperture.

(e) Polarisation and Modern Optics :

Production and detection of linearly and circularly polarized light; Double refraction,

quarter wave plate; Optical activity; Principles of fibre optics, attenuation; Pulse dispersion in step index and parabolic index fibres; Material dispersion, single mode fibers; Lasers-Einstein A and B coefficients. Ruby and He-Ne lasers. Characteristics of laser light-spatial and temporal coherence; Focusing of laser beams. Three-level scheme for laser operation; Holography and simple applications.

3. Electricity and Magnetism :

(a) Electrostatics and Magnetostatics :

Laplace and Poisson equations in electrostatics and their applications; Energy of a system of charges, multipole expansion of scalar potential; Method of images and its applications. Potential and field due to a dipole, force and torque on a dipole in an external field; Dielectrics, polarisation. Solutions to boundary-value problems-conducting and dielectric spheres in a uniform electric field; Magnetic shell, uniformly magnetised sphere; Ferromagnetic materials, hysteresis, energy loss.

(b) Current Electricity :

Kirchhoff's laws and their applications. Biot-Savart law, Ampere's law, Faraday's law, Lenz' law. Self-and mutual- inductances; Mean and rms values in AC circuits; DC and AC circuits with R, L and C components; Series and parallel resonance; Quality factor; Principle of transformer.

4. Electromagnetic Waves and Blackbody Radiation :

Displacement current and Maxwell's equations; Wave equations in vacuum, Poynting theorem; Vector and scalar potentials; Electromagnetic field tensor, covariance of Maxwell's equations; Wave equations in isotropic dielectrics, reflection and refraction at the boundary of two dielectrics; Fresnel's relations; Total internal reflection; Normal and anomalous dispersion; Rayleigh scattering; Blackbody radiation and Planck 's radiation law- Stefan-Boltzmann law, Wien's displacement law and Rayleigh-Jeans law.

5. Thermal and Statistical Physics :

(a) Thermodynamics :

Laws of thermodynamics, reversible and irreversible processes, entropy; Isothermal, adiabatic, isobaric, isochoric processes and entropy changes; Otto and Diesel engines, Gibbs' phase rule and chemical potential; Van der Waals equation of state of a real gas, critical constants; Maxwell-Boltzmann distribution of molecular velocities, transport phenomena, equipartition and virial theorems; Dulong-Petit, Einstein, and Debye's theories of specific heat of solids; Maxwell relations and application; Clausius-Clapeyron equation. Adiabatic demagnetisation, Joule-Kelvin effect and liquefaction of gases.

(b) Statistical Physics :

Macro and micro states, statistical distributions, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Distributions, applications to specific heat of gases and blackbody radiation; Concept of negative temperatures.

PAPER-II

1. Quantum Mechanics :

Wave-particle duality; Schroedinger equation and expectation values; Uncertainty principle;

Solutions of the one-dimensional Schroedinger equation for free particle (Gaussian wave-packet), particle in a box, particle in a finite well, linear harmonic oscillator; Reflection and transmission by a step potential and by a rectangular barrier; Particle in a three dimensional box, density of states, free electron theory of metals; Angular momentum; Hydrogen atom; Spin half particles, properties of Pauli spin matrices.

2. **Atomic and Molecular Physics :**

Stern-Gerlach experiment, electron spin, fine structure of hydrozen atom; L-S coupling, J-J coupling; Spectroscopic notation of atomic states; Zeeman effect; Franck-Condon principle and applications; Elementary theory of rotational, vibrational and electronic spectra of diatomic molecules; Raman effect and molecular structure; Laser Raman spectroscopy; Importance of neutral hydrogen atom, molecular hydrogen and molecular hydrogen ion in astronomy. Fluorescence and Phosphorescence; Elementary theory and applications of NMR and EPR; Elementary ideas about Lamb shift and its significance.

3. **Nuclear and Particle Physics :**

Basic nuclear properties-size, binding energy, angular momentum, parity, magnetic moment; Semi-empirical mass formula and applications. Mass parabolas; Ground state of a deuteron, magnetic moment and non-central forces; Meson theory of nuclear forces; Salient features of nuclear forces; Shell model of the nucleus - success and limitations; Violation of parity in beta decay; Gamma decay and internal conversion; Elementary ideas about Mossbauer spectroscopy; Q-value of nuclear reactions; Nuclear fission and fusion, energy production in stars. Nuclear reactors.

Classification of elementary particles and their interactions; Conservation laws; Quark structure of hadrons : Field quanta of electroweak and strong interactions; Elementary ideas about unification of forces; Physics of neutrinos.

4. Solid State Physics, Devices and Electronics :

Crystalline and amorphous structure of matter; Different crystal systems, space groups; Methods of determination of crystal structure; X-ray diffraction, scanning and transmission electron microscopies; Band theory of solids—conductors, insulators and semi-conductors; Thermal properties of solids, specific heat, Debye theory; Magnetism: dia, para and ferromagnetism; Elements of super-conductivity, Meissner effect, Josephson junctions and applications; Elementary ideas about high temperature super-conductivity.

Intrinsic and extrinsic semi-conductors- p-n-p and n-p-n transistors; Amplifiers and oscillators. Op-amps; FET, JFET and MOSFET; Digital electronics-Boolean identities, De Morgan's laws, Logic gates and truth tables. Simple logic circuits; Thermistors, solar cells; Fundamentals of microprocessors and digital computers.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

PAPER- I

Political Theory and Indian Politics :

1. Political Theory: meaning and approaches.
2. Theories of state : Liberal, Neo-liberal, Marxist, Pluiralist, post-colonial and Feminist.

2018 – 19
PS

B.Sc. (Physics)Semester I-Theory Syllabus 56hrs
Paper – I:Mechanics

(W.E.F the academic year 2016-2017)
(CBCS)

Unit – I

1. Vector Analysis (14)

Scalar and vector fields, gradient of a scalar field and its physical significance.Divergence and curl of a vector field and related problems.Vector integration, line, surface and volume integrals.Stokes, Gauss and Greens theorems-simple applications.

Unit – II

2. Mechanics of Particles (07)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section,

3. Mechanics of rigid bodies (07)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor.Euler's equation, precession of a top, Gyroscope,

Unit – III

4. Centralforces (14)

Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

Unit – IV

5. Special theory of relativity (14)

Galilean relativity, absolute frames, Michelson-Morley experiment. Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation.Concept of four vector formalism.

NOTE: Problems should be solved at the end of every chapter of all units.

B.Sc. (Physics)Semester II-Theory Syllabus — 56 hrs
Paper – II :Waves and Oscillations

(W.E.F the academic year 2016-2017)
(CBCS)

Unit – I

1. Fundamentals of vibrations (14)

Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus , compound pendulum, measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures

Unit – II

2. Damped and forced oscillations (14)

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance. Coupled Oscillators.

Unit – III

3. Vibrating Strings (14)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverse impedance

Unit – IV

4. Vibrations of bars (14)

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

NOTE: Problems should be solved at the end of every chapter of all units.

B.Sc. Semester III-Theory Syllabus 56hrs

Subject: Physics Paper – III :Thermodynamics

(W.E.F the academic year 2017-2018)

Unit – I

1. **Kinetic theory of gases: (6)**

   Introduction – Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.

2. **Thermodynamics: (8)**

   Basics of thermodynamics-Kelvin's and Claussius statements – Thermodynamic scale of temperature – Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature-Entropy (T-S) diagram – Change of entropy of a perfect gas-change of entropy when ice changes into steam.

Unit – II

3. **Thermodynamic potentials and Maxwell's equations: (7)**

   Thermodynamic potentials – Derivation of Maxwell's thermodynamic relations – Clausius-Clayperon's equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas.Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.

4. **Low temperature Physics: (7)**

   Joule Kelvin effect – liquefaction of gas using porous plug experiment. Joule expansion – Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza's method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type.

Unit – III

5. **Quantum theory of radiation: (14)**

   Black body-Ferry's black body – distribution of energy in the spectrum of Black body – Wein's displacement law, Wein's law, Rayleigh-Jean's law – Quantum theory of radiation - Planck's law – deduction of Wein'sdistribution law, Rayleigh-Jeans law, Stefan's law from Planck's law.

Measurement of radiation using pyrometers – Disappearing filament optical pyrometer – experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

Unit – IV

6. Statistical Mechanics: (14)

Introduction, postulates of statistical mechanics.Phase space, concept of ensembles and some known ensembles ,classical and quantum statistics and their differences, concept of probability, Maxwell-Boltzmann's distribution law -Molecular energies in an ideal gas-Maxwell-Boltzmann's velocity distribution law, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws, Application of B-E distribution to Photons-planks radiation formula, Application of Fermi-Dirac statistics to white dwarfs and Neutron stars.

Textbooks

1. **Fundamentals of Physics**. Halliday/Resnick/Walker.*C. Wiley India Edition 2007.*
2. **Second Year Physics** – *Telugu Academy.*
3. **Modern Physics** by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) *S. Chand & Co.*
4. **Heat and Thermodynamics** by Mark W.Zemansky 5th edition McGraw - Hill
5. **Heat and Thermodynamics** by D.S. Mathur.

Reference Books

1. **Modern Physics** by G. Aruldhas and P. Rajagopal. *Eastern Economy Education.*
2. Berkeley Physics Course. Volume-5. **Statistical Physics** by F. Reif. *The McGraw-Hill Companies.*
3. **An Introduction to Thermal Physics** by Daniel V. Schroeder.*Pearson Education Low Price Edition.*
4. **Thermodynamics** by R.C. Srivastava, Subit K. Saha&Abhay K. *Jain Eastern Economy Edition.*
5. **Modern Engineering Physics** by A.S. Vasudeva. *S.Chand& Co. Publications.*
6. **Feyman's Lectures on Physics** Vol. 1,2,3& 4. *Narosa Publications.*
7. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*

8 .B.B. Laud **"Introduction to statistics Mechanics"**(Macmillan 1981)

9. F.Reif: **"Statistical Physics "**(Mcgraw-Hill,1998)

10.K.Haung: "**Statistical Physics "**(Wiley Eastern 1988)

B.Sc. Semester IV-Theory Syllabus 56hrs

Subject :(Physics) Paper – IV :Optics

(W.E.F the academic year 2017-2018)

Unit I

1 Interference: (14)

Principle of superposition – coherence – temporal coherence and spatial coherence – conditions for Interference of light

Interference by division of wave front: Fresnel's biprism – determination of wave length of light. Determination of thickness of a transparent material using Biprism – change of phase on reflection – Lloyd's mirror experiment.

Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non reflecting films – interference by a plane parallel film illuminated by a point source – Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire-Newton's rings in reflected light with and without contact between lens and glass plate, Newton's rings in transmitted light (Haidinger Fringes) – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light, Difference in wavelength of sodium D_1,D_2 lines and thickness of a thin transparent plate.

Unit I1:

2 Diffraction: (14)

Introduction – Distinction between Fresnel and Fraunhoffer diffraction Fraunhoffer diffraction:- Diffraction due to single slit and circular aperture – Limit of resolution – Fraunhoffer diffraction due to double slit – Fraunhoffer diffraction pattern with N slits (diffraction grating)

Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating.

Fresnel diffraction-Fresnel's half period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – diffraction at a straight edge – difference between interference and diffraction.

Unit III:

3 Polarization (14)

Polarized light : Methods of Polarization, Polarization by reflection, refraction, Double refraction, selective absorption , scattering of light – Brewsters law – Malus law – Nicol prism polarizer and analyzer – Refraction of plane wave incident on negative and positive crystals (Huygen's explanation) – Quarter wave plate, Half wave plate – Babinet's compensator – Optical activity, analysis of light by Laurent's half shade polarimeter.

Unit IV:

4 Aberrations and Fiber Optics : (14)

Introduction – Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration – the achromatic doublet – Removal of chromatic aberration of a separated doublet.

Fiber Optics : Introduction – Optical fibers –Principles of fiber communication – Step and graded index fibers – Rays and modes in an optical fiber – Fiber material – Types of optical fibers and advantages of fiber communication.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1. **Optics** by AjoyGhatak. *The McGraw-Hill companies.*
2. **Optics** by Subramaniyam and Brijlal. *S. Chand & Co.*
3. **Fundamentals of Physics**. Halliday/Resnick/Walker.*C. Wiley India Edition 2007.*
4. **Optics and Spectroscopy**. R. Murugeshan and Kiruthiga Siva Prasath. *S. Chand & Co.*
5. **Second Year Physics** – *Telugu Academy.*

Reference Books

1. **Modern Engineering Physics** by A.S. Vasudeva. *S.Chand& Co. Publications.*
2. **Feyman's Lectures on Physics** Vol. 1,2,3& 4. *Narosa Publications.*
3. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*
4. K. Ghatak, **Physical Optics'**
5. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay,1988)
6. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
7. Smith and Thomson: 'Optics' (John Wiley and sons)

B.Sc. Semester V-Theory Syllabus

42 hrs

Subject :(Physics) Paper – V :Electromagnetism

(DSE- Compulsory)

(W.E.F the academic year 2018-2019)

Unit I :

Electrostatics (11hrs)

Electric Field:- Concept of electric field lines and electric flux, Gauss's law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field E, irrotational field. Electric Potential:- Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field.Calculation of potential from electric field for a spherical charge distribution.

Unit II :

Magnetostatics(12hrs)

Concept of magnetic field B and magnetic flux, Biot-Savart's law, B due to a straight current carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B, solenoidal field. Integral form of Ampere's law, applications of Ampere's law: field due to straight, circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance.Magnetic force between two current carrying conductors.Magnetic field intensity. Ballistic Galvanometer:- Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance.

Unit III:

Electromagnetic Induction (9hrs)

Faraday's laws of induction (differential and integral form), Lenz's law, self and mutual Induction. Continuity equation, modification of Ampere's law, displacement current. Maxwell equations

Unit IV :

Electromagnetic waves (10hrs)

Maxwell's equations in vacuum and dielectric medium, boundary conditions, plane wave equation: transverse nature of EM waves, velocity of light in vacuum and in medium, polarization, reflection and transmission. Polarization of EM waves, Brewster's angle, description of linear, circular and elliptical polarization.

Text Books

1. Fundamentals of electricity and magnetism By Arthur F. Kip (McGraw-Hill, 1968)
2. Electricity and magnetism by J.H.Fewkes& John Yarwood. Vol.I (Oxford Univ. Press, 1991).
3. Introduction to Electrodynamics, 3rd edition, by David J. Griffiths, (Benjamin Cummings,1998).

Reference Books

4. Electricity and magnetism By Edward M. Purcell (McGraw-Hill Education, 1986)
5. Electricity and magnetism. By D C Tayal (Himalaya Publishing House,1988)
6. Electromagnetics by Joseph A.Edminister 2nd ed.(New Delhi: Tata McGraw Hill, 2006).

Subject :(Physics)

B.Sc. Semester V-Theory Syllabus

(DSE- Elective-I)

42hrs

Paper-VI-A – Solid State Physics

Unit-I(11hrs)

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors.Lattice with a Basis – Central and Non-Central Elements.Unit Cell.Miller Indices.Types of Lattices, Reciprocal Lattice.Brillouin Zones.Diffraction of X-rays by Crystals.Bragg's Law.Atomic and Geometrical Factor.

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons.Qualitative Description of the Phonon Spectrum in Solids.Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T3 law

Unit-II(11hrs)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia–and Paramagnetic Domains.Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains.Discussion of B-H Curve.Hysteresis and Energy Loss.

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom.Depolarization Field.Electric Susceptibility.Polarizability.ClausiusMosotti Equation.Classical Theory of Electric Polarizability.

Unit-III(10 hrs)

Elementary band theory: Kronig Penny model. Band Gap.Brillouin zones, effective mass of electron. Conductor, Semiconductor (P and N type) and insulator.Conductivity of Semiconductor, mobility, Hall Effect,Electric Conductivity by four probe method& Hall coefficient.

UNIT IV(10hrs)

Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion.Three-Level and Four-Level Lasers.Ruby Laser and He-Ne Laser.

Superconductivity: Experimental Results. Critical Temperature.Critical magnetic field.Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect.Idea of BCS theory.D.C and A.C Josepson effects.

Text Books:

1. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
2. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
3. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
4. Solid State Physics – S. O. Pillai (New Age Publication)
5. Modern Physics by R.Murugesham

B.Sc. Semester V-Theory Syllabus

Subject :(Physics) **(DSE- Elective-I)** **42 hrs**

Paper-VI-B –QUANTUM MECHANICS AND APPLICATIONS

Unit-I (11hrs)

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions.Normalization.Linearity and Superposition Principles.Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum.Wave Function of a Free Particle.

Unit II(11 hrs)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle.

Unit-III(10 hrs)

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimensionacross a step potential & rectangular potential barrier.

Unit-IV(10hrs)

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization.Electron Spin and Spin Angular Momentum.Larmor's Theorem. Spin Magnetic Moment. SternGerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Lectures)

Text Books:

1. A Text book of Quantum Mechanics, P. M.Mathews and K.Venkatesan, 2nd Ed., 2010, McGraw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.

B.Sc. Semester VI-Theory Syllabus

Subject :(Physics) **(DSC- Compulsory)** **42hrs**

Paper-VII–MODERN PHYSICS

UNIT-I (11hrs)

Atomic Spectra and Models Inadequacy of classical physics:

Brief Review of Black body Radiation , Photoelectric effect, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohr's model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld'sModification of Bohr's Theory.

UNIT-II(11hrs)

Wave Particle Duality de Broglie hypothesis. Experimental confirmation of matter wave, Davisson Germer Experiment. velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets ,Gaussian Wave Packet , spatial distribution of wave packet, Localization of wave packet in time. Time development of a wave Packet; Wave Particle Duality, Complementarity . Heisenberg Uncertainty Principle,Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Time independent and time dependent Schrodinger wave equation.Estimation of ground state energy of harmonic oscillator and hydrogen atom, non-existence of electron in the nucleus.Uncertainty and Complementarities.

UNIT-III(9hrs)

Nuclear Physics Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

Unit IV(11hrs)

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus. Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions), Classification of Elementary Particles

B.Sc. Semester VI-Theory Syllabus

Subject :(Physics) (DSE- Elective-II) **42 hrs**

Paper-VIII-A :Basic Electronics

Unit-I: (10hrs)

Network Elements and Network Theorems

Passive elements, Power sources, Active Elements, Network Models: T and π Transformations, Superposition theorem,Thevenin's Theorem, Norton's theorem. Reciprocity Theorem and Maximum power transfer theorem (Simple problems).

Two-port Networks – Introduction- Z-parameters, Y-parameters, h-parameters and ABCD-parameters (Simple problems).

Unit – II: (10hrs)

Band theory of P-N junction

1. Energy band in solids (band theory), valence band, conduction band and forbidden energy gap solids, Insulators, semi conductors and, pure or intrinsic semiconductors and impurity or extrinsic semi-conductors. N-type extrinsic semi-conductors, P-type extrinsic semi-conductors, Fermi level, continuity equation.

2. Diodes: P-N junction diode, Bridge rectifier. Zener diode & its Characteristics.Zener diode as voltage regulator.

Unit-III: (11hrs)

1. Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations – transistor as an amplifier -RC coupled amplifier. (Qualitative analysis)

2. Feedback Concept & Oscillators: Feedback, General theory of feedback–Concepts of a Oscillators, Barkhausen's criteria, Phase shift Oscillator.

Unit-IV: (11hrs)

1. Digital Electronics

Binary number system, converting Binary to Decimal and vice versa.Binary addition and subtraction (1's and 2's complement methods).Hexadecimal number system.Conversion from Binary to Hexadecimal – vice versa and Decimal to Hexadecimal vice versa.

B.Sc. Semester VI-Theory Syllabus **42 hrs**

Subject :(Physics) **(DSE- Elective-II)**

Paper-VIII-B :Physics of Semiconductor Devices

Unit-I: (11hrs)

Semiconductor Physics: Conductors, Semiconductors, forbidden orbits, energy levels, crystals and covalent bonds, free electrons and holes, recombination and life-time, energy bands. Intrinsic Semiconductor- intrinsic carrier concentration, density of electrons in conduction band, fermi-level, mass action law. Carrier transport phenomena- mobility, resistivity, diffusivity, Einstein's relation, current density equation. Extrinsic semiconductor-n-type semiconductor, p-type semiconductor, energy band diagram of extrinsic semiconductor. Hall effect- mobility and Hall angle, experiment arrangement for the study of Hall effect, significance of Hall effect.

Unit – II: (11hrs)

P-N junction-Depletion layer, Energy level diagram of p-n junction, Band structure of an open circuited p-n junction, Biasing of p-n junction, effect of barrier potential on forward bias, reverse leakage current, reverse breakdown, P-n junction under various conditions-thermal equilibrium, forward and reverse bias, current-voltage characteristics. Derivation of ideal diode equation of p-n junction, diode model and its approximations.Forward and reverse resistance of diode.Dynamic characteristic of diode.

Unit-III: (10hrs)

Special diodes-Zener diode, Light –emitting diode (LED), Photo-diode, Schottky diode, Backward diodes and Tunnel diode.
Transistors- Bipolar junction transistor (BJT), transistor characteristics, transistor equation in active region, field effect transistor (FET), Phototransistor and MOSFETTs.

Unit-IV: (10 hrs)

Control devices- Shockley Diode, Silicon Controlled Rectifier (SCR), Silicon Controlled Switch (SCS), Unijunction transistor (UJT), Solar Cells, Opto-couplers.

Textbooks

1. A First Course in Electronics- Anwar A. Khan&Kanchan K. Dey, PHI
2. Physics of Semiconductor Devices- S. M. Sze
3. Physics of Semiconductors- Streetman

Solutions of the one-dimensional Schroedinger equation for free particle (Gaussian wave-packet), particle in a box, particle in a finite well, linear harmonic oscillator; Reflection and transmission by a step potential and by a rectangular barrier; Particle in a three dimensional box, density of states, free electron theory of metals; Angular momentum; Hydrogen atom; Spin half particles, properties of Pauli spin matrices.

2. **Atomic and Molecular Physics :**

Stern-Gerlach experiment, electron spin, fine structure of hydrozen atom; L-S coupling, J-J coupling; Spectroscopic notation of atomic states; Zeeman effect; Franck-Condon principle and applications; Elementary theory of rotational, vibrational and electronic spectra of diatomic molecules; Raman effect and molecular structure; Laser Raman spectroscopy; Importance of neutral hydrogen atom, molecular hydrogen and molecular hydrogen ion in astronomy. Fluorescence and Phosphorescence; Elementary theory and applications of NMR and EPR; Elementary ideas about Lamb shift and its significance.

3. **Nuclear and Particle Physics :**

Basic nuclear properties-size, binding energy, angular momentum, parity, magnetic moment; Semi-empirical mass formula and applications. Mass parabolas; Ground state of a deuteron, magnetic moment and non-central forces; Meson theory of nuclear forces; Salient features of nuclear forces; Shell model of the nucleus - success and limitations; Violation of parity in beta decay; Gamma decay and internal conversion; Elementary ideas about Mossbauer spectroscopy; Q-value of nuclear reactions; Nuclear fission and fusion, energy production in stars. Nuclear reactors.

Classification of elementary particles and their interactions; Conservation laws; Quark structure of hadrons : Field quanta of electroweak and strong interactions; Elementary ideas about unification of forces; Physics of neutrinos.

4. **Solid State Physics, Devices and Electronics :**

Crystalline and amorphous structure of matter; Different crystal systems, space groups; Methods of determination of crystal structure; X-ray diffraction, scanning and transmission electron microscopies; Band theory of solids—conductors, insulators and semi-conductors; Thermal properties of solids, specific heat, Debye theory; Magnetism: dia, para and ferromagnetism; Elements of super-conductivity, Meissner effect, Josephson junctions and applications; Elementary ideas about high temperature super-conductivity.

Intrinsic and extrinsic semi-conductors- p-n-p and n-p-n transistors; Amplifiers and oscillators. Op-amps; FET, JFET and MOSFET; Digital electronics-Boolean identities, De Morgan's laws, Logic gates and truth tables. Simple logic circuits; Thermistors, solar cells; Fundamentals of microprocessors and digital computers.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

PAPER- I

Political Theory and Indian Politics :

1. Political Theory: meaning and approaches.
2. Theories of state : Liberal, Neo-liberal, Marxist, Pluiralist, post-colonial and Feminist.

3. Justice : Conceptions of justice with special reference to Rawl's theory of justice and its communitarian critiques.
4. Equality : Social, political and economic; relationship between equality and freedom; Affirmative action.
5. Rights : Meaning and theories; different kinds of rights; Concept of Human Rights.
6. Democracy : Classical and contemporary theories; different models of democracy—representative, participatory and deliberative.
7. Concept of power : hegemony, ideology and legitimacy.
8. Political Ideologies : Liberalism, Socialism, Marxism, Fascism, Gandhism and Feminism.
9. Indian Political Thought: *Dharamshastra, Arthashastra* and Buddhist Traditions; Sir Syed Ahmed Khan, Sri Aurobindo, M. K. Gandhi, B. R. Ambedkar, M. N. Roy.
10. Western Political Thought : Plato, Aristotle, Machiavelli, Hobbes, Locke, John S. Mill, Marx, Gramsci, Hannah Arendt.

Indian Government and Politics

1. **Indian Nationalism :**
   (a) Political Strategies of India's Freedom Struggle : Constitutionalism to mass Satyagraha, Non-cooperation, Civil Disobedience; Militant and Revolutionary Movements, Peasant and Workers Movements.
   (b) Perspectives on Indian National Movement; Liberal, Socialist and Marxist; Radical Humanist and Dalit.
2. Making of the Indian Constitution : Legacies of the British rule; different social and political perspectives.
3. Salient Features of the Indian Constitution : The Preamble, Fundamental Rights and Duties, Directive Principles; Parliamentary System and Amendment Procedures; Judicial Review and Basic Structure doctrine.
4. (a) Principal Organs of the Union Government : Envisaged role and actual working of the Executive, Legislature and Supreme Court.
   (b) Principal Organs of the State Government : Envisaged role and actual working of the Executive, Legislature and High Courts.
5. Grassroots Democracy : Panchayati Raj and Municipal Government; Significance of 73rd and 74th Amendments; Grassroot movements.
6. Statutory Institutions/Commissions : Election Commission, Comptroller and Auditor General, Finance Commission, Union Public Service Commission, National Commission for Scheduled Castes, National Commission for Scheduled Tribes, National Commission for Women; National Human Rights Commission, National Commission for Minorities, National Backward Classes Commission.
7. Federalism : Constitutional provisions; changing nature of centre-state relations; integrationist tendencies and regional aspirations; inter-state disputes.
8. Planning and Economic development : Nehruvian and Gandhian perspectives; Role of

planning and public sector; Green Revolution, land reforms and agrarian relations; liberalization and economic reforms.

9. Caste, Religion and Ethnicity in Indian Politics.
10. Party System : National and regional political parties, ideological and social bases of parties; Patterns of coalition politics; Pressure groups, trends in electoral behaviour; changing socio-economic profile of Legislators.
11. Social Movement : Civil liberties and human rights movements; women's movements; environmentalist movements.

PAPER-II

Comparative Politics and International Relations

Comparative Political Analysis and International Politics :

1. Comparative Politics : Nature and major approaches; Political economy and political sociology perspectives; Limitations of the comparative method.
2. State in Comparative Perspective : Characteristics and changing nature of the State in capitalist and socialist economies, and advanced industrial and developing societies.
3. Politics of Representation and Participation : Political parties, pressure groups and social movements in advanced industrial and developing societies.
4. Globalisation : Responses from developed and developing societies.
5. Approaches to the Study of International Relations : Idealist, Realist, Marxist, Functionalist and Systems theory.
6. Key Concepts in International Relations : National interest, security and power; Balance of power and deterrence; Transational actors and collective security; World capitalist economy and globalisation.
7. Changing International Political Order :
   (a) Rise of super powers; Strategic and ideological Bipolarity, arms race and cold war; Nuclear threat;
   (b) Non-aligned Movement : Aims and achievements.
   (c) Collapse of the Soviet Union; Unipolarity and American hegemony; Relevance of non-alignment in the contemporary world.
8. Evolution of the International Economic System : From Brettonwoods to WTO; Socialist economies and the CMEA (Council for Mutual Economic Assistance); Third World demand for new international economic order; Globalisation of the world economy.
9. United Nations : Envisaged role and actual record; Specialized UN agencies—aims and functioning; need for UN reforms.
10. Regionalisation of World Politics : EU, ASEAN, APEC, AARC, NAFTA.
11. Contemporary Global Concerns : Democracy, human rights, environment, gender justice terrorism, nuclear proliferation.

India and the World

1. Indian Foreign Policy : Determinants of foreign policy; the institutions of policy-making;

Continuity and change.

2. India's Contribution to the Non-Alignment Movement Different phases; Current role.
3. India and South Asia :
   (a) Regional Co-operation : SAARC-past performance and future prospects.
   (b) South Asia as a Free Trade Area.
   (c) India's "Look East" policy.
   (d) Impediments to regional co-operation : River water disputes; illegal cross border migration; Ethnic conflicts and insurgencies; Border disputes.
4. India and the Global South : Relations with Africa and Latin America; Leadership role in the demand for NIEO and WTO negotiations.
5. India and the Global Centres of Power : USA, EU, Japan, China and Russia.
6. India and the UN System: Role in UN Peace-keeping; Demand for Permanent Seat in the Security Council.
7. India and the Nuclear Question : Changing perceptions and policy.
8. Recent developments in Indian Foreign Policy : India's position on the recent crises in Afghanistan, Iraq and West Asia, growing relations with US and Isreal; Vision of a new world order.

PSYCHOLOGY

PAPER-I

Foundations of Psychology

1. **Introduction** : Definition of Psychology; Historical antecedents of Psychology and trends in the 21st centrury; Psychology and scientific methods; Psychology in relation to other social sciences and natural sciences; Application of Psychology to societal problems.

2. **Methods of Psychology** : Types of research : Descriptive, evaluative, diagnostic and prognostic; Methods of Research : Survey, observation, case-study and experiments; Characteristics of experimental design and non-experimental designs; quasi-experimental designs; Focussed group discussions, brain storming, grounded theory approach.

3. **Research methods** : Major steps in psychological research (problem statement, hypothesis formulation, research design, sampling, tools of data collection, analysis and interpretation and report writing); Fundamental versus applied research; Methods of data collection (interview, observation, questionnaire and case study). Research Designs (Ex-post facto and experimental). Application of statistical techniques (t-test, two-way ANOVA, correlation and regression and factor analysis) item response theory.

4. **Development of Human Behaviour** : Growth and development; Principles of development, Role of genetic and environmental factors in determining human behaviour; Influence of cultural factors in socialization; Life span development—Characteristics, development tasks, promoting psychological well-being across major stages of the life span.

5. **Sensation, Attention and Perception** : Sensation: concepts of threshold, absolute and difference thresholds, signal-detection and vigilance; Factors influencing attention including set

GOVERNMENT DEGREE COLLEGE (W)

BEGUMPET, HYDERABAD

RE-ACCREDITED WITH "B" GRADE BY NAAC

POLITICAL SCIENCE

PAPER-III, V-SEMESTER, SYLLABUS-2018-19

MODULE: WESTERN POLITICAL THOUGHT

Duration:90Hrs

UNIT I: INTRODUCTION AND ANCIENT POLITICAL THOUGHT

20Hr

1.Political Thought : Nature , Methods and significance.
2.Plato: Theory of Justice and Ideal State.
3. Aristotle: Classification of Governments , Slavery and Theory of Revolutions.

UNIT-II: MEDIEVAL AND EARLY MODERN POLITICAL THOUGHT

15Hrs

1.Saint Thomas Acquinas : Views on Church- State, Slavery, Classification of governments and Theory of Law.
2. Church- State controversy.
3.Nicolo Machiavelli: Views on Human Nature, Religion, State Craft and suggestions to the Prince.

UNIT-III: SOCIAL CONTRACTUALISTS

20Hr

1.Thomas Hobbes: Views on Human Nature, State of Nature, Social Contract Theory, Individualism and Absolute Sovereignty.
2.John Lock: State of Nature, Human Nature and Social contract, Natural Rights and Limited Government.
3 . Jean Jacquies Rousseau: State of Nature, Human Nature , Social Contract, General Will and Popular Sovereignty.

UNIT-IV: UTILITARIANS 15Hrs

1. Jeremy Bentham: Principles of Utilitarianism.
2. J.S.Mill: Views on Bentham's Utilitarianism, Liberty, Representative Government and Women's Liberty.

UNIT-IV: MARXIST THINKERS 20Hrs

1.Karl Marx: Dialectical Materialism, Historical Materialism, Class Struggle, Surplus Value and communism.
2.Antonio Gramsci: Hegemony and Civil Society.

University Nominee
Board of studies

Department of Political Science
Osmania University
Hyderabad-500 007.

Members

1.

2.

Principal

GOVERNMENT DEGREE COLLEGE (W)

BEGUMPET, HYDERABAD

RE-ACCREDITED WITH "B" GRADE BY NAAC

POLITICAL SCIENCE

PAPER-III, VI-SEMESTER, SYLLABUS-2018-19

MODULE: INDIAN POLITICAL THOUGHT

Duration: 90 Hrs

UNIT-I: INTRODUCTION AND ANCIENT POLITICAL THOUHT

15Hrs

1. Sources, Concepts and Ancient Political Thought Western and Indian Political Thought comparison
2. Main sources and concepts of Indian Political Thought. Manu: Manusmruthi, Origin of the state, Varna Dharma, State and Society.

UNIT-II: ANCIENT AND MEDIEVALPOLITICAL THOUGHT

20 HrS

1. Kautilya: Arthasastra, Saptanga Theory, State Craft and Mandala Theory.
2. Gauthama Buddha: Dhamma and Sangha, Social and Political Ideas, Nature of the State, Powers and Functions.

UNIT-III: EGALITARIAN THINKERS

20Hrs

1. Jyothirao Phule: Critique of Brahmanism and Social revolution.
2. B.R.Ambedkar: Theory of Caste, Anhilation of Caste and State Socialism.

UNIT-IV: UNIVERSAL POLITICAL THINKERS

15Hrs

1. Swami Vivekananda: Social and Political Ideas . Ideal Society
2. Rabindranah Tagore: Critique of Nationalsim

UNIT-V: NATIONALIST POLITICAL THINKERS 20Hrs

1. Mohandas Karamchand Gandhi : Ahimsa, Satyagraha, Philosophical Anarchism, Theory of Trusteeship, Views on Economy and Grama swaraj.
2. Jawaharlal Nehru: Nationalism, Secularism and Economic, Social and political Democracy, Internationalism, Non-Alignment and panchasheel.

University Nominee
Board of studies

HEAD
Department of Political Science
Osmania University
Hyderabad-500 007.

Members

1.

2.

Principal

GOVERNMENT DEGREE COLLEGE (W)

BEGUMPET, HYDERABAD

RE-ACCREDITED WITH "B" GRADE BY NAAC

POLITICAL SCIENCE

PAPER-IV, V-SEMESTER, SYLLABUS-2018-19

MODULE: INTERNATIONAL RELATIONS-I

Duration: 90 Hours

UNIT-I: INTRODUCTION TO INTERNATIONAL RELATIONS

15HOURS

1. Introduction to International Relations: Evolution, Meaning, Definition, Nature, Scope and Significance.
2. Rise of Sovereign state system: Origin and Development of the Modern state system , Further growth of change in the state system, Main features of the nation-state system and factors responsible for the decline of state system.

20HOURS

UNIT-II: HISTORY OF INTERNATIONAL RELATONS

1.Colonialism: Rise of colonialism, Causes for the rise of colonialism, Phases and impact of colonialism.

2.The First World War: Nature ,causes and its impact on International Relations. Second World War, Nature , Causes and Consequences.

UNIT- III: POST WAR DEVELOPMENTS

20HOURS

1.Decolonisation: Causes of decolonization and its Impact. Emergence of Third world , Problems and Prospects.

2.Cold war: Definition , Causes, Phases and Impact.

UNIT-IV :CONCEPTS IN INTERNATIONAL RELATIONS

20HOURS

1.National power: Meaning , Definition and Elements. Super Power, Regional power,

2. Détente – Bipolarity- Unipolarity and Multipolarity. Peace and Security.

UNIT-V: INTERNATIONAL POLITICAL ECONOMY 15HOURS

1.Neo-colonialism: North-South Dialogue, South-South Cooperation.
2. IBRD, IMF , WTO and Globalisation .

University Nominee
Board of studies

HEAD
Department of Political Science
Osmania University
Hyderabad-500 007.

Members

1.

2.

Principal

GOVERNMENT DEGREE COLLEGE (W)

BEGUMPET, HYDERABAD

RE-ACCREDITED WITH "B" GRADE BY NAAC

POLITICAL SCIENCE

PAPER-IV, VI-SEMESTER, SYLLABUS-2018-19

MODULE: INTERNATIONAL RELATIONS-II

DURATION:90HOURS

UNIT-I: INTERNATIONAL AND REGIONAL ORGANISATIONS

25HOURS

1.United Nations Organisation: Objectives ,Structure, Achievements and Challenges , Need for reforms and Restructuring and Reforming of the UNO.

2.Regionalisation of world politics: European Union, ASEAN, and BRICS

UNIT-II: INTERNATIONAL SECURITY

15HOURS

1.Arms race, Arms Control and Disarmament : History of Arms control and disarmament and Agreements

3. Issues in Nuclear politics: NPT - India's Nuclear Policy

UNIT-III: FOREIGN POLICY

20HOURS

1.Foreign policy Determinants , Features of India's Foreign policy, Non-Alignment and its relevance.

2.Indias relation with Major powers USA, Russia

UNIT-IV: INDIA AND SOUTH ASIA

15 HOURS

1. SAARC. India's Look East Policy.

2.Impediments to regional co-operation: River water disputes; Illegal cross-border migration; ethnic conflicts and insurgencies border disputes.

UNIT-V : EMERGING AREAS IN INTERNATIONAL RELATIONS 15HOURS

1. Environment : Issues and Challenges. Multiculturalism
2. Terrorism: Causes, Types, Methods of terrorists and measures to Combat.

University Nominee
Board of studies

HEAD
Department of Political Science
Osmania University
Hyderabad-500 007.

Members

1.

2.

Principal

2018-19
ans

9. Psychological problem of social integration :

The concept of social integration. The problem of caste, class, religion and language conflicts and prejudice. Nature and manifestation of prejudice between the ingroup and outgroup. Casual factors of such conflicts and prejudices. Psychological strategies for handling the conflicts and prejudices. Measures to achieve social integration.

10. Application of Psychology in Information Technology and Mass Media :

The present scenario of information technology and the mass media boom and the role of psychologists. Selection and training of Psychology professionals to work in the field of IT and mass media. Distance learning through IT and mass media. Entrepreneurship through e-commerce. Multilevel marketing. Impact of TV and fostering value through IT and mass media. Psychological consequences of recent developments in Information Technology.

11. Psychology and Economic development :

Achievement motivation and economic development. Characteristics of entrepreneurial behaviour. Motivating and Training people for entrepreneurship and economic development; Consumer rights and consumer awareness, Government policies for promotion of entrepreneurship among youth including women entreprenures.

12. Application of Psychology to environment and related fields :

Environmental Psychology effects of noise, pollution and crowding. Population Psychology : Psychological consequence of population explosion and high population density. Motivating for small family norms. Impact of rapid scientific and technological growth on degradation of environment.

13. Application of psychology in other fields :

(a) Military Psychology

Devising psycological tests for defence personnel for use in selection, Training, counseling; training psychologists to work , with defence personnel in promoting positive health; Human engineering in defence.

(b) Sports Psychology

Psychological interventions in improving performance of athletes and sports. Persons participating in Individual and Team Games.

(c) Media influences on pro and anti-social behaviour.

(d) Psychology of Terrorism.

14. Psychology of Gender :

Issues of discrimination, Management of diversity; Glass ceiling effect, Self-fulfilling prophesy, Women and Indian society.

PUBLIC ADMINISTRATION

PAPER-I

Administration Theory

1. Introduction :

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

Meaning, scope and significance of Public Administration, Wilson's vision of Public Administration, Evolution of the discipline and its present status. New Public Administration, Public Choice approach; Challenges of liberalization, Privatisation, Globalisation; Good Governance: concept and application; New Public Management.

2. **Administrative Thought :**

Scientific Management and Scientific Management movement; Classical Theory; Weber's bureaucratic model its critique and post-Weberian Developments; Dynamic Administration (Mary Parker Follett); Human Relations School (Elton Mayo and others); Functions of the Executive (C.I. Barnard); Simon's decision-making theory; Participative Management (R. Likert, C. Argyris, D. McGregor.)

3. **Administrative Behaviour :**

Process and techniques of decision-making; Communication; Morale; Motivation Theories content, process and contemporary; Theories of Leadership: Traditional and Modem:

4. **Organisations :**

Theories systems, contingency; Structure and forms: Ministries and Departments, Corporations, Companies; Boards and Commissions; Ad hoc, and advisory bodies; Headquarters and Field relationships; Regulatory Authorities; Public-Private Partnerships.

5. **Accountability and Control :**

Concepts of accountability and control; Legislative, Executive and judicial control over administration; Citizen and Administration; Role of media, interest groups, voluntary organizations; Civil society; Citizen's Charters; Right to Information; Social audit.

6. **Administrative Law :**

Meaning, scope and significance; Dicey on Administrative law; Delegated legislation; Administrative Tribunals.

7. **Comparative Public Administration :**

Historical and sociological factors affecting administrative systems; Administration and politics in different countries; Current status of Comparative Public Administration; Ecology and administration; Riggsian models and their
critique.

8. **Development Dynamics :**

Concept of development; Changing profile of development administration; 'Anti-development thesis'; Bureaucracy and development; Strong state versus the market debate; Impact of liberalisation on administration in developing countries; Women and development the self-help group movement.

9. **Personnel Administration :**

Importance of human resource development; Recruitment, training, career advancement, position classification, discipline, performance appraisal, promotion, pray and service conditions; employer-employee relations, grievance redressal mechanism; Code of conduct; Administrative ethics.

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

10. **Public Policy :**

Models of policy-making and their critique; Processes of conceptualisation, planning, implementation, monitoring, evaluation and review and their limitations; State theories and public policy formulation.

11. **Techniques of Adminstrative Improvement :**

Organisation and methods, Work study and work management; e-governance and information technology; Management aid tools like network analysis, MIS, PERT, CPM.

12. **Financial Administration :**

Monetary and fiscal policies: Public borrowings and public debt Budgets types and forms; Budgetary process; Financial accountability; Accounts and audit.

PAPER-II

Indian Administration

1. **Evolution of Indian Administration :**

Kautilya Arthashastra; Mughal administration; Legacy of British rule in politics and administration Indianization of Public services, revenue administration, district Administration, local self Government.

2. **Philosophical and Constitutional framework of Government :**

Salient features and value premises; Constitutionalism; Political culture; Bureaucracy and democracy; Bureaucracy and development.

3. **Public Sector Undertakings :**

Public sector in modern India; Forms of Public Sector Undertakings; Problems of autonomy, accountability and control; Impact of liberalization and privatization.

4. **Union Government and Administration :**

Executive, Parliament, Judiciary-structure, functions, work processes; Recent trends; Intra-governmental relations; Cabinet Secretariat; Prime Minister's Office; Central Secretariat; Ministries and Departments; Boards; Commissions;
Attached offices; Field organizations.

5. **Plans and Priorities :**

Machinery of planning; Role, composition and functions of the Planning Commission and the National Development Council; 'Indicative' planning; Process of plan formulation at Union and State levels; Constitutional Amendments (1992) and decentralized planning for economic development and social justice.

6. **State Government and Administration :**

Union-State administrative, legislative and financial relations; Role of the Finance Commission; Governor; Chief Minister; Council of Ministers; Chief Secretary; State Secretariat; Directorates.

7. **District Administration since Independence :**

Government strives to have a workforce which reflects gender balance and women candidates are encouraged to apply.

Changing role of the Collector; Union-State-local relations; Imperatives of development management and law and order administration; District administration and democratic decentralization.

8. **Civil Services :**

Constitutional position; Structure, recruitment, training and capacity building; Good governance initiatives; Code of conduct and discipline; Staff associations; Political rights; Grievance redressal mechanism; Civil service neutrality; Civil service activism.

9. **Financial Management :**

Budget as a political instrument; Parliamentary control of public expenditure; Role of finance ministry in monetary and fiscal area; Accounting techniques; Audit; Role of Controller General of Accounts and Comptroller and Auditor
General of India.

10. **Administrative Reforms since Independence :**

Major concerns; Important Committees and Commissions; Reforms in financial management and human resource development; Problems of implementation.

11. **Rural Development :**

Institutions and agencies since Independence; Rural development programmes: foci and strategies; Decentralization and Panchayati Raj; 73rd Constitutional amendment.

12. **Urban Local Government :**

Municipal governance: main features, structures, finance and problem areas; 74th Constitutional Amendment; Global-local debate; New localism; Development dynamics, politics and administration with special reference to city
management.

13. **Law and Order Administration:**

British legacy; National Police Commission; Investigative agencies; Role of Central and State Agencies including para military forces in maintenance of law and order and countering insurgency and terrorism; Criminalisation of politics and administration; Police-public relations; Reforms in Police.

14. **Significant issues in Indian Administration:**

Values in public service; Regulatory Commissions; National Human Rights Commission; Problems of administration in coalition regimes; Citizen administration interface; Corruption and administration; Disaster management.

SOCIOLOGY

PAPER– I

FUNDAMENTALS OF SOCIOLOGY

1. **Sociology - The Discipline:**

(a) Modernity and social changes in Europe and emergence of Sociology.

(b) Scope of the subject and comparison with other social sciences.

2018-19

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD

Autonomous

DEPARTMENT OF PUBLIC ADMINISTRATION

SEMESTER-1/ MODULE - 1 (Credits)

BASICS OF PUBLIC ADMINISTRATION - I

SYLLABUS

UNIT-1 NATURE OF PUBLIC ADMINISTRATION

1. Meaning and Importance of Public Administration

Meaning of Administration and Public Administration, Definitions Nature - Integral view and Managerial view. Scope - POSDCORB view. Subject Matter view Importance of Public Administration in modern society, Importance of Public Administration in Developing Societies.

2. State and Evolution of Public Administration

Origin of the State - Administrative Organizations, Evolution of Modern Administration - Stages in the Evolution of Public Administration, Politics Administration Dichotomy,Principles of Administration, Era of Challenge, Crisis of Identity, Public Policy Perspective, Governance, E-governance.

UNIT-11 RELATIONSHIP WITH OTHER SOCIAL SCIENCES (20 HRS)

3. Public Administration and Law

Meaning, Definition of Law - Relationship of Public Administration with Law

4. Public Administration and Political Science

Meaning, Definition of Political Science, Dichotomy - Woodrow Wilson's Views, Interdependence.

5. Public Administration and Economics .

Meaning, Definition of Economics - Relationship of Public Administration with Economics.

6.Public Administration and Psychology

Meaning, Definition of Psychology - Relationship of Public Administration with Psychology

7. Public Administration and Sociology Meaning, Definition of Sociology - Relationship of Public Administration with Sociology

UNIT= II ORIENTAL AND CLASSICAL APPROACHES

8. Oriental Approach: Kautilya.

9. Classical Approach : Henry Fayol, Luther Gullick and Lyndall Urwick

Introduction and Contribution of Henry Fayol - Activities of an Industrial Undertaking, Elements of Administration, 14 Principles of Administration; Criticism; Introduction of Luther Gullick and Lyndall Urwicks Views on **Organizatio**n and Structure; Principles of Organization - Gullick and Urwick; Bases of Departmental Organization - 4 p's; Critical Evaluation

10. Scientific Management Approach: F.W.Taylor

Introduction, Meaning of Scientific Management, Principles, Techniques of Scientific Management, Criticism.

11.**Bureaucratic Approach : Max Weber and Karl Marx** Introduction of Max Weber, Meaning, Definition of Bureaucracy, factors responsible for the rise of Bureaucracy, Weber's Views on Authority - Traditional Authority, Charismatic Authority, Legal Rational AuthorityCharacteristics of Bureaucracy; Criticism: Introduction of Karl Marx; Karl Marx's Views on Bureaucracy.

UNIT-IV HUMAN RELATIONS AND BEHAVIOURAL APPROACHES

12. Human Relation Approach : Elton Mayo

Introduction of Elton Mayo - Initial Experiments, Hawthorne studies - Experiments - Illumination Experiment, Relay Assembly Test Room Experiment, Human Attitudes and Sentiments, Social Organization/Bank Wiring Experiment;

13. Chester Barnard and Herbert Simon's Decision-Making Theory

Introduction of Chester Barnard, Formal and Informal Organizations, Contribution - Satisfaction Equilibrium, Theory of Authority, Executive Functions: Criticism; Summary. Introduction of Simon, Simon's views on Classical Approach, Simon's Concept of Decision-Making, Stages of Decision-Making, Ends and Means, Rationality in Decision-Making; Criticism.

14.Socio Psychological Approach: Abraham Maslow, McGregor

Introduction, Maslow's Hierarchy of Needs - Physiological Needs, Security Needs. Social Needs, Esteem Needs, Self Actualization Needs; Criticism, douglas Mc. Gregor's Theory-X and Theory-Y, Managerial Assumption about Theory X and Theory-Y: Criticism, Summary

UNIT-V ECOLOGICAL AND SOCIAL JUSTICE APPROACHES

15 Administrative Ecology : F.W. Riggs

Introduction Meaning of Ecological Approach, Agraria-Industria Model: Fused-Prismatic Diffracted Model, Characteristics.

16.Social Justice Approach: B.R. Ambedkar

17. Jyothi Rao Phule

Bond of Studies
Chairman of Bos

University of Nominee

MeMbers

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD

Autonomous

DEPARTMENT OF PUBLIC ADMINISTRATION

SEMESTER - 1*1/ MO*DULE - II *(5* Credits)

DEVELOPMENT DYNAMICS AND EMERGING TRENDS - II

SYLLABUS

U

NIT - I COMPARATIVE AND DEVELOPMENT ADMINISTRATION

1.Comparative Administration

Introduction, Origin, Definition, Scope, Significance of Comparative Public Administration, Conclusion.

2. Development Administration

Introduction, Meaning and Definitions, Concept of Development Administration, **Attributes/Features** of Development Administration, Scope of Development *Adm*inistration, Challen*ges* to Development Administration, Conclusion.

UNIT -II EMERGING TRENDS-

4. N*ew Pu*blic Administration - Minnowbrook - 1

Intro*duc*tion - Rise and Growth of New Public Administration; The First MinnowBrook Confe*rence*-Goals/themes, Criticism.

5. N*ew* Public Administration - Minnowbrook - II

The Se*co*nd MinnowBrook Conference - Features, Similarities and Dissimilarities bet*we*en land JI

UNIT-11 MARKET TH*EO*RIES

7 Publ*ic* Cho*ice* Approach

*Intro*duction, The Background - Theoretical Traditions, Main Features or *Recommenda*tions of Public Choice Theory

8. *New* Public *M*anagement

*Intro*duction, Evolution, New Public Management - Components, Salient Features, NPM as Neo Taylorism, Entrepreneurial Government, Conclusion.

UNIT - IV EMERGING TRENDS

9. Public Policy and Governance

Public Policy - Introduction, Meaning, Characteristics of Public Policy Making, Growing Importance of Public Policy. Governance Introduction, Meaning Features of Good Governance,

10.Role of Public Services in the Emergence and Development of New State of Telangana

UNIT-V EMERGING TRENDS - III

11. Present Status of Public Administration in the context of Globalization

Introduction, Meaning of Globalization, Ideological Perspectives Implications for Public Administration, Changing Role of Public Administration,

12. Post Modern Public Administration

Introduction, Origin, Meaning and Concepts in Post Modernism, Post Modern Public Administration

Board of Studies
Chairman of Bos

University of Nominee

Members

independence of disturbances concept of structure and model for simultaneous equations, problem of identification-rank and order conditions of identifiability, two-stage least sauare method of estimation.

Present official statistical system in India relating to population, agriculture, industrial production, trade and prices, methods of collection of official statistics, their reliability and limitations, principal publications containing such statistics, various official agencies responsible for data collection and their main functions.

4. Demography and Psychometry :

Demographic data from census, registration, NSS other surveys, their limitations. and uses, definition, construction and uses of vital rates and ratios, measures of fertility, reproduction rates, morbidity rate, standardized death rate, complete and abridged life tables, construction of life tables from vital statistics and census returns, uses of life tables, logistic and other population growth curves, fitting a logistic curve, population projection, stable population, quasi-stable population, techniques in estimation of demographic parameters, standard classification by cause of death, health surveys and use of hospital statistics.

Methods of standardisation of scales and tests, Z-scores, standard scores, T-scores, percentile scores, intelligence quotient and its measurement and uses, validity and reliability of test scores and its determination, use of factor analysis and path analysis in psychometry.

ZOOLOGY

PAPER–I

1. Non-chordata and Chordata :

(a) Classification and relationship of various phyla up to subclasses: Acoelomate and Coelomate, Protostomes and Deuterostomes, Bilateria and Radiata; Status of Protista, Parazoa, Onychophora and Hemichordata; Symmetry.

(b) Protozoa: Locomotion, nutrition, reproduction, sex; General features and life history of *Paramaecium, Monocystis. Plasmodium* and *Leishmania.*

(c) Porifera: Skeleton, canal system and reproduction.

(d) Cnidaria: Polymorphism, defensive structures and their mechanism; coral reefs and their formation; metagenesis; general features and life history of *Obelia* and *Aurelia.*

(e) Platyhelminthes: Parasitic adaptation; general features and life history of Fasciola and Taenia and their-Pathogenic symptoms.

(f) Nemathelminthes: General features, life history, parasitic adaptation of Ascaris and *Wuchereria.*

(g) Annelida: Coelom and metamerism; modes of life in polychaetes; general features and life history of Nereis, earthworm and leach.

(h) Arthropoda: Larval forms and parasitism in Crustacea; vision and respiration in arthropods (Prawn, cockroach and scorpion); modification of mouth, parts in insects (cockroach, mosquito, housefly, honey bee and butterfly), metapmor phosis in insect and its hormonal regulation, socialbehaviour ofApis and termites.

(i) Molluscs: Feeding, respiration, locomotion, general features and life history of

Lamellidens, Pila and Sepia. Torsion and detorsion in gastropods.

(j) Echinodermata: Feeding, respiration, locomotion, larval forms, general features and life history of *Asterias*.

(k) Protochordata: Origin of chordates; general features and life history of *Branchiostoma* and *Herdmania*.

(l) Pisces: Respiration, locomotion and migration.

(m) Amphibia: Origin of tetrapods, parental care, paedomorphosis.

(n) Reptilia; Origin of reptiles, skull types, status of *Sphenodon* and crocodiles.

(o) Aves: Origin of birds, flight adaptation, migration.

(p) Mammalia: Origin of mammals, dentition, general features of egg laying mammals, pouchedmammals, aquatic mammals and primates, endocrine glands (pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) and their interrelationships.

(q) Comparative functional anatomy of various systems of vertebrates. (integument and its derivatives, endoskeleton, locomotory organs, digestive system,. respiratory system, circulatory system including heart and aortic arches, urinogenital system, brain and sense organs (eye and ear).

2. Ecology :

(a) Biosphere: concept of biosphere; biomes, Biogeochemical cycles, Human induced changes in atmosphere including green house effect, ecological succession, biomes and ecotones, community ecology.

(b) Concept of ecosystem; structure and function of ecosystem, types of ecosystem, ecological succession, ecological adaptation.

(c) Population; characteristics, population dynamics, population stabilization.

(d) Biodiversity and diversity conservation of natural resources.

(e) Wildlife of India.

(f) Remote sensing for sustainable development.

(g) Environmental biodegradation; pollution and its impact on biosphere and its prevention.

3. Ethology :

(a) Behaviour: Sensory filtering, responsiveness, sign stimuli, learning, and memory, instinct, habituation, conditioning, imprinting.

(b) Role of hormones in drive; role of pheromones in alarm spreading; crypsis, predator detection, predator tactics, social hierarchies in primates, social organization in insects;

(c) Orientation, navigation, homing; biological rhythms: biological clock, tidal, seasonal and circadian rhythms.

(d) Methods of studying animal behaviour including sexual conflict, selfishness, kinship and altruism.

4. Economic Zoology :

(a) Apiculture, sericulture, lac culture, carp culture, pearl culture, prawn culture, vermiculture.

(b) Major infectious and communicable diseases (malaria, filaria, tuberculosis, cholera and AIDS) their vectors, pathogens and prevention.

(c) Cattle and livestock diseases, their pathogen (helminths) and vectors (ticks, mites, Tabanus, Stomoxys).

(d) Pests of sugar cane (*Pyrilla perpusiella*), oil seed *(Achaeajanata)* and rice *(Sitophilus oryzae).*

(e) Transgenic animals.

(f) Medical biotechnology, human genetic disease and genetic counselling, gene therapy.

(g) Forensic biotechnology.

5. Biostatistics :

Designing of experiments; null hypothesis; correlation, regression, distribution and measure of central
tendency, chi square, student-test, F-test (one-way & two-way F-test).

6. Instrumentation methods :

(a) Spectrophotometer, phase contrast and fluorescence microscopy, radioactive tracer, ultra centrifuge, gel . electrophoresis, PCR, ELISA, FISH and chromosome painting.

(b) Electron microscopy (TEM, SEM).

PAPER II

1. Cell Biology :

(a) Structure and function of cell and its organelles (nucleus, plasma membrane, mitochondria, Golgi bodies, endoplasmic reticulum, ribosomes and lysosomes), cell division (mitosis and meiosis), mitotic spindle and mitotic apparatus, chromosome movement chromosome type ploytene and lambrush, organization of chromatin, heterochromatin, Cell cycle regulation.

(b) Nucleic acid topology, DNA motif, DNA replication, transcription, RNA processing, translation, protein foldings and transport.

2. Genetics :

(a) Modern concept of gene, split gene, genetic regulation, genetic, code.

(b) Sex chromosomes and their evolution, sex determination in Drosophila and human.

(c) Mendel's laws of inheritance, recombination, linkage, multiple alleles, genetics of blood groups, pedigree analysis, hereditary diseases in human.

(d) Mutations and mutagenesis.

(e) Recombinant DNA technology, plasmid, cosmid, artificial chromosomes as vectors, transgenics, DNA cloning and whole animal cloning (principles and methods).

(f) Gene regulation and expression in prokaryotes and eukaryotes.

(g) Signal molecules, cell death, defects in signaling pathway and consequences.

(h) RFLP, RAPD and AFLF and application of RFLP in DNA finger-printing, ribozyme technologies, human genome project, genomics and protomics.

3. Evolution :

(a) Theories of origin of life.

(b) Theories of evolution; Natural selection, role of mutation in evolution, evolutionary patterns, molecular drive, mimicry, variation, isolation and speciation.

(c) Evolution of horse, elephant and human using fossil data.

(d) Hardy-Weinberg Law.

(e) Continental drift and distribution of animals.

4. Systematics :

Zoological nomenclature, international code, cladistics, molecular taxonomy and biodiversity.

5. Biochemistry :

(a) Structure and role of carbohydrates, fats, fatty acids, cholesterol, proteins and amino-acids, nucleic acids. Bioenergetics.

(b) Glycolysis and Krebs cycle, oxidation and reduction, oxidative phosphorylation; energy conservation and release, ATP, cycl cyclic AMP-its structure and role.

(c) Hormone classification (steroid and peptide hormones), biosynthesis and functions.

(d) Enzymes: types and mechanisms of action.

(e) Vitamins and co-enzymes.

(f) Immunoglobulin and immunity.

6. Physiology (with special reference to mammals) :

(a) Composition and constituents of blood; blood groups and Rh factor in human; factors and mechanism of coagulation; iron metabolism, acid-base balance, thermo regulation, anticoagulants.

(b) Haemoglobin: Composition, types and role in transport of oxygen and carbon dioxide.

(c) Digestion and absorption: Role of salivary glands, liver, pancreas and intestinal glands.

(d) Excretion: nephron and regulation of urine formation; osmo-regulation and excretory product.

(e) Muscles: Types, mechanism of contraction of skeletal muscles, effects of exercise on muscles.

(f) Neuron: nerve impulse—its conduction and synaptic transmission; neurotransmitters.

(g) Vision, hearing and olfaction in human.

(h) Physiology of reproduction puberty and menopause in human.

7. Developmental Biology :

(a) Gametogenesis; spermatogenesis, composition of semen, in vitro and in vivo capacitation of mammalian sperm, Oogenesis, totipotency; fertilization, morphogenesis and morphogen;

blastogeneis, establishment of body axes formation, fate map, gestulation in frog and chick; genes in development in chick homeotic genes, development of eye and heart, placenta in mammals.

(b) Cell lineage, cell to cell interaction, Genetic and induced teratogenesis, role of thyroxine in control of metamorphosisin amphibia, paedogenesis and neoteny, cell death, aging.

(c) Developmental genes in human, in vitro fertilization; and embryo transfer; cloning.

(d) Stem cells: Sources, types and their use in human welfare.

(e) Biogenetic law.

APPENDIX-IIA

INSTRUCTIONS TO THE CANDIDATES FOR FILLING ONLINE APPLICATIONS

- Candidates are required to apply Online using the website www.upsconline.nic.in.
- Salient features of the system of Online Application Form are given hereunder:
- Detailed instructions for filling up online applications are available on the above mentioned website.
- Candidates will be required to complete the Online Application Form containing two stages viz. Part-I and Part-II as per the instructions available in the above mentioned site through drop down menus.
- The candidates are required to pay a fee of Rs.100/- Rupees One Hundred only) [excepting SC/ST/ Female/Persons with Benchmark Disability candidates who are exempted from payment of fee] either by depositing the money in any branch of State Bank of India by cash, or by using net banking facility of State Bank of India or by using any Visa/Master/RuPay Credit/ Debit Card.
- Before start filling up Online Application, a candidate must have his photograph and signature duly scanned in the .jpg format in such a manner that each file should not exceed 300 KB each and must not be less than 20 KB in size for the photograph and signature.
- The candidate should have details of one Photo ID viz. Aadhar Card/ Voter Card / PAN Card / Passport/ Driving License / Any other photo ID card issued by the State / Central Government. The details of this photo ID will have to be provided by the candidate while filling up the online application form. The candidates will have to upload a scanned copy of the Photo ID whose details have been provided in the online application by him/her. This photo ID will be used for all future references and the candidate is advised to carry this ID while appearing for the examination.
- The Online applications (Part I and II) can be filled from 4th March, 2021 to 24th March, 2021 till 18:00 Hrs.
- Applicants should avoid submitting multiple applications. However, if due to any unavoidable circumstances, any applicant submits multiple applications then he/she must ensure that the applications with higher RID is complete in all respects.
- In case of multiple applications, the applications with higher RID shall be entertained by the Commission and fee paid against one RID shall not be adjusted against any other RID.
- The applicants must ensure that while filling their Application Form, they are providing their

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER –I
Module –I /Core-I
Animal Diversity - Invertebrates

Periods: 60 **Max. Marks: 75**

UNIT – I **(15 Periods)**

1.1 Brief history of Invertebrates
- 1.1.1 Kingdom Animalia
- 1.1.2 Brief history of Invertebrates

1.2 Protozoa
- 1.2.1 General characters
- 1.2.2 Classification up to classes with examples
- 1.2.3 Type study - *Elphidium*
- 1.2.4 Life cycle of *Plasmodium*
- 1.2.5 Locomotion, Reproduction and Diseases

1.3 Porifera
- 1.3.1 General characters
- 1.3.2 Classification of Porifera up to classes with examples
- 1.3.3 Type study - *Sycon*
- 1.3.4 Canal system in sponges and Spicules

UNIT – II **(15 Periods)**

2.1. Cnidaria
- 2.1.1 General characters
- 2.1.2 Classification of Cnidaria up to classes with examples
- 2.1.3 Type study - *Obelia*
- 2.1.4 Polymorphism in hydrozoa
- 2.1.5 Corals and coral reef formation

2.2 Platyhelminthes
- 2.1.1 General characters
- 2.1.2 Classification of Platyhelminthes up to classes with examples
- 2.1.3 Type study- *Schistosoma*

2.3 Nemathelminthes
- 2.3.1 General characters
- 2.3.2 Classification of Nemathelminthes up to classes with examples
- 2.3.3 Type study - *Dracunculus*
- 2.3.4 Parasitic Adaptations in Helminthes

UNIT – III **(15 Periods)**

3.1 Annelida
- 3.1.1 General characters
- 3.1.2 Classification of Annelida up to classes with examples
- 3.1.3 Type study - *Hirudinaria granulosa*
- 3.1.4 Evolutionary significance of Coelome and Coelomoducts and metamerism

CHAIRPERSON
Board of Studies in Zoology
Osmania University, HYD-7.

3.2 Arthropoda

3.2.1 General characters

3.2.2 Classification of Arthropoda up to classes with examples

3.2.3 Type study - Prawn

3.2.4 Mouth parts of Insects

3.2.5 Insect metamorphosis

3.2.6 *Peripatus* - Structure and affinities

UNIT – IV **(15 Periods)**

4.1 Mollusca

4.1.1 General characters

4.1.2 Classification of Mollusca up to classes with examples

4.1.3 Type study - *Pila*

4.1.4 Pearl formation

4.1.5 Torsion and detorsion in gastropods

4.2 Echinodermata

4.2.1 General characters

4.2.2 Classification of Echinodermata up to classes with examples

4.2.3 Water vascular system in star fish

4.2.4 Echinoderm larvae and their significance

4.3 Hemichordata

4.3.1 General characters

4.3.2 Classification of Hemichordata up to classes with examples

4.3.3 *Balanoglossus* - Structure and affinities

Suggested Readings

1. **L.H. Hyman** *"The Invertebrates Vol I, II and V"* M.C. Graw Hill Company Ltd
2. **Kotpal, R.L. 1988 - 1992** Protozoa, Porifera, Coelenterata, Helminthes, Arthropoda, Mollusca, Echinodermata, Rastogi Publications, Meerut.
3. **E.L. Jordan and P.S. Verma** *"Invertebrate Zoology"* S. Chand and Company.
4. **R.D. Barnes** *"Invertebrate Zoology"* by: W.B. Saunders CO., 1986.
5. **Barrington, E.J.W.,** *"Invertebrate structure and Function"* by ELBS
6. **P.S. Dhami and J.K. Dhami.** Invertebrate Zoology, S. Chand and Co. New Delhi.
7. **Parker, T.J. and Haswell** *"A text book of Zoology"* by, W.A. Mac Millan Co. London
8. **Barnes, R.D. (1982).** *Invertebrate Zoology*, V Edition"

CHAIRPERSON
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER - II
Module - II (Core-II)
Ecology, Zoogeography and Animal Behavior

Periods: 60 **Max. Marks: 75**

UNIT - I **(15 Periods)**

1.1 Ecology - I

1.1.1 Ecosystem structure and functions
1.1.2 Types of Ecosystems - Aquatic and Terrestrial
1.1.3 Biogeochemical cycles - Nitrogen, Carbon, Phosphorus and Water
1.1.4 Energy flow in ecosystem
1.1.5 Food chains, Food web and ecological pyramids
1.1.6 Animal Associations - Mutualism, commensalism, parasitism, competition, predation

UNIT - II **(15 Periods)**

2.1 Ecology - II

2.1.1 Concept of Species, Population dynamics and Growth curves.
2.1.2 Community Structure and dynamics and Ecological Succession
2.1.3 Ecological Adaptations
2.1.4 Environmental Pollution - Sources, Effects and Control measures of Air, Water, Soil and Noise pollution.
2.1.5 Wildlife conservation - National parks and Sanctuaries of India, Endangered species
2.1.6 Biodiversity and hotspots of Biodiversity in India

UNIT - III **(15 Periods)**

3.1 Zoogeography

3.1.1 Zoogeographical regions - Palaearctic, Nearctic, Neotropical, Oriental, Australian and Ethiopian regions - their Climatic and faunal peculiarities
3.1.2 Wallace line, Discontinuous distribution
3.1.3 Continental Drift

UNIT - IV **(15 Periods)**

4.1 Animal Behaviour

4.1.1 Types of behaviour - Innate and Acquired, Instinctive and Motivated behaviour
4.1.2 Taxes, Reflexes, Tropisms
4.1.3 Physiology and phylogeny of learning, trial and error learning, Imprinting, habituation, Classical conditioning, Instrumental conditioning
4.1.5 Social behavior, Communication, Pheromones
4.1.6 Biological rhythms, Biological clocks, Circadian rhythms

Chairperson
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER –III
Module –III /Core-III
Animal Diversity- Vertebrates and Developmental Biology

Periods: 60 **Max. Marks: 75**

UNIT – I Chordates Characters and Classification up to orders **(15 Periods)**

1.1. Urochordata, Cephalochordata, Cyclostomata

1.1.1. Salient features of Urochordata , Retrogressive metamorphosis and its significance, and Cephalochordata.

1.1.2. General characters of Cyclostomata.

1.1.3. General characters of Fishes.

1.1.4. General characters and Classification of Amphibia up to orders with examples.

1.1.5. General characters and Classification of Reptiles up to orders with examples.

1.1.6 General characters and Classification of Aves up to orders with examples.

1.1.7. General characters and Classification of Mammalia up to orders with examples.

UNIT – II Chordate Modifications & Adaptations **(15 Periods)**

2.1. Fishes, Amphibians, Reptiles, Aves & Mammals

2.1.1. Types of Scales and Types of fins.

2.1.2. Migration in fishes.

2.1.3. Parental care in amphibian.

2.1.4 Migration in Birds.

2.1.5 Flight adaptation in Birds.

2.1.6 Dentition in mammals.

2.1.7 Aquatic adaptations in mammals.

UNIT – III Comparitive Anatomy of Vertebrates (Scoliodon, Rana, Calotes , Columbia) **(15 Periods)**

3.1.1. Digestive system in Vertebrates.

3.2.2. Respiratory system in Vertebrates.

3.2.3. Development of heart and aortic arches.

3.2.4. Structure of heart in Vertebrates.

3.2.5. Structure of Kidney in Vertebrates.

3.2.6 Nervous system-Brain.

3.2.7. Reproductive System in Vertebrates.

UNIT – IV **(15 Periods)**

4.1 **Developmental Biology and Embryology**

4.1.1. Gametogenesis (Spermatogenesis and Oogenesis)

4.1.2 Fertilization

4.1.3. Types of eggs

4.1.4. Types of cleavages

4.1.5. Formation of Foetal membrane in chick embryo and their functions

4.1.6. Types and functions of Placenta in mammals

4.1.7. Regeneration in Turbellaria and Lizards

CHAIRPERSON
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER - IV
Module - IV (Core IV)
Cell Biology, Genetics & Evolution

Periods: 60 **Max. Marks: 75**

UNIT – I **(15 Periods)**

1. Cell Biology

1.1. Cell theory, Differences of Prokaryotic and Eukaryotic cells
1.2. Structure and functions of plasma membrane Structure,composition of Plasma membrane, fluid mosaic model
1.3.Structure and functions of cell organelles - Endoplasmic reticulum, Golgi body, Ribosomes, Lysosomes ,Mitochondria and Nucleus
1.4. Chromosomes – Structure, types, giant chromosomes
1.5. Cell Division - Mitosis, Meiosis
1.6. Cell cycle and its regulation

UNIT – II **(15 Periods)**

2. Molecular Biology

2.1 DNA (Deoxyribo Nucleic Acid) - Structure
2.2 RNA (Ribo Nucleic Acid) - Structure, types
2.3 DNA Replication
2.4 Protein Synthesis – Transcription and Translation
2.5 Gene Expression – Genetic Code, operon concept Lac operon
2.6 Molecular Biology Techniques- Polymerase Chain Reaction.

UNIT – III **(15 Periods)**

3. Genetics

3.1 Mendels laws of Inheritance and Incomplete dominance,Co-dominance
3.2 Human Karyotyping and amniocentesis.
3.3.Sex determination and sex-linked inheritance
3.4. Chromosomal Mutations- Deletion, Duplication, Inversion, Translocation
3.5. Inborn errors of metabolism Alkaptonuria,Phenyl ketonuria,Glycogen,Storage disease
3.6.Chromosomal disorders-Down syndrome,Patau's syndrome,Klinefelter's syndrome and Turner's syndrome.

UNIT – IV **(15 Periods)**

4. Evolution

4.1. Theories of evolution – Lamarckism - Darwinism and Modern synthetic theory.
4.2. Evidences of Evolution and Hardy-Weinberg Law.
4.3. Forces of Evolution – mutation, gene flow, genetic drift, and natural selection
4.4. Isolation – Pre-mating and post mating isolating mechanisms
4.5. Speciation: Methods of speciation – Allopatric and sympatric
4.6. Causes and Role of Extinction in Evolution.

CHAIRPERSON
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER –V
DSC/Module –V /Core-V/PAPER-V
ANIMAL PHYSIOLOGY

Periods: 60 **Max. Marks: 75**

UNIT – I **(15 Periods)**

1.1 DIGESTION

1.1.1 Digestion definition and extra and intracellular digestion
1.1.2 Digestion of Carbohydrates, Proteins, Lipids and Cellulose
1.1.3 Absorption and Assimilation of digested food; role of Gastrointestinal hormones in digestion

1.2RESPIRATION

1.2.1 Definition of Respiration and Respiratory mechanisms – External, Internal and cellular
1.2.2 Respiratory Pigments; Transport of oxygen, Oxygen dissociation curves, Bohr's effect
1.2.3 Transport of CO_2, Chloride shift; Regulation of respiration – nervous and chemical

UNIT-II **(15 periods)**

2.1CIRCULATION

2.1.1 Types of circulation - Open and Closed circulation
2.1.2 Structure of Mammalian Heart, Types of hearts – Neurogenic and Myogenic, Heart function – Conduction and regulation of heart beat
2.1.3 Regulation of Heart rate – Tachycardia and Bradycardia, Blood Clotting mechanism

2.2 EXCRETION

2.2.1Classification of Animals on the basis of excretory products- Ammonotelic, Uricotelic, Ureotelic
2.2.2 Structure and function of Nephron.
2.2.3 Urine formation, Counter current mechanism.

UNIT – III **(15 periods)**

3.1. MUSCLE CONTRACTION

3.1.1 Types of Muscles
3.1.2 Ultra structure of skeletal muscle fibre
3.1.3 Sliding Filament theory, muscle contraction mechanism and energetics

3.2.NERVE IMPULSE

3.2.1 Structure of Neuron
3.2.2 Nerve impulse - Resting potential and Action potential and Conduction of Nerve impulse
3.2.3 Synapse, types of synapses and Synaptic transmission

UNIT – IV **(15 periods)**

4.1ENDOCRINE SYSTEM

4.1.1 Endocrine glands – Structure, secretions and functions of Pituitary, Thyroid, Parathyroid, Adrenal gland and Pancreas
4.1.2 Hormone action and concept of Secondary messengers
4.1.3 Male and Female Hormones, Hormonal control of Menstrual cycle in humans

4.2. HOMEOSTASIS AND ENZYMES

4.2.1 Concept and Mechanism of Homeostasis
4.2.2 Osmoregulation – Water and ionic regulation by freshwater, brackish water and marine animals
4.2.3 Enzymes: Definition, Classification, Inhibition and Regulation

CHAIR PERSON
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER –V
DSE/ PAPER-VI

Periods: 60 Max. Marks: 75

UNIT-I : Introduction of sericulture 15 (periods)

1.1. History of sericulture and present status of Sericulture industry in India.
1.2. Sericulture as agro industry –perspectives and prospects of Sericulture in India.
1.3. Geographical distribution of various species and economic races of silkworms- Mulberry, Tasar, Eri and Muga silkworm.
1.4. Types of silkworm host plants and their systematic position.

Unit-II: Biology of silkworms 15 (periods)

2.1. Morphology and anatomy of silkglands.
2.2. Properties and composition of silk.
2.3. Life cycle, external morphology and biology of Mulberry silkworm.
2.4. Internal morphology of silkworm- Digestive Respiratory, Nervous, Excretory and Reproductive systems.

Unit-III: Diseases of Silkworm 15 (periods)

3.1 Influence of biotic and abiotic factors on the incidence of diseases.
3.2 Diseases of Bombyx mori and Philosomia ricini- viral and bacterial, Preventive and control measures.
3.3. Diseases of Bombyx mori and Philosomia ricini- fungal and protozoan, Preventive and control measures.
3.4. Insect and vertebrate pests of silkworm and their management.

Unit-IV: Silkworm rearing 15 (periods)

4.1. Silkworm rearing house and rearing appliances.
4.2. Feeding and rearing methods of mulberry silkworms.
4.3 Mounting and harvesting of mulberry silk cocoons.
4.4 Commercial characters of cocoons and price fixation.

References

1. Handbook of sericulture – S.R. Ullal and M. N. Narasimhanna
2. An introduction to sericulture – G. Ganga, J. Sulochana Chetty
3. Manual of Sericulture – FAO Volumes

CHAIR-PERSON
Board of Studies in Zoology
Osmania University, HYD-7.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.
(AUTONOMOUS)
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2018-19
SEMESTER –VI
DSC/Module –VII /Core-VII/PAPER-VII
Immunology and Animal Biotechnology

Periods: 60 **Max. Marks: 75**

Unit I: Immunology- Basic concepts: Antigens and Antibodies

1.1. Basic concepts of Immunology. Cells , Primary and secondary organs of immune system

1.2. Types of immunity- innate and acquired

1.3. Basic properties of antigens, Structure function and types of antigen & antibodies. Antigen-antibody reactions. Monoclonal antibodies and their production

1.4. B and T -cell epitopes, Haptens, adjuvants. T cell and B cell activation.

Unit II: Working of an Immune system :

2.2. Structure and functions of Major histocompatibility complex.

2.3. Basic properties and functions of Cytokines, Interferons and Complement proteins.

2.4. Humoral and cell mediated immunity.

2.5. Types of Hyper sensitivity , concepts of autoimmunity and immunodeficiency.

UNIT III: Animal Biotechnology

3.1. Concept and scope of Animl Biotechnology

3.2. Cloning vectors – Plasmids, Cosmids , Lamda bacteriophage, YAC

3.3, Cloning – Cloning methods (cell, animal and gene cloning).

3.4. Animal cell culture- Equipment and materials for animal cell culture.

3.5. Applications of cell culture techniques.

CHAIR-PERSON
Board of Studies in Zoology
Osmania University, HYD-7.

UNIT IV: Animal Biotechnology and Genetically modified organisms

4.1. Recombinant DNA technology and its application.

4.2. Transgenesis- Methods of Transgenesis.

4.3 Production of transgenic animals and application of transgenic animals in biotechnology.

4.4. Stem cells- types and their applications.

4.5. Introduction to vaccines and types of vaccines.

Suggested Readings

- **Arthur C. Guyton MD** A Text Book of Medical Physiology, Eleventh ed., John E. Hall, Harcourt Asia Ltd
- **William F. Ganong** A Review of Medical Physiology, 22 ed, McGraw Hill, 2005
- **Sherwood, Klandrof, Yane**, Human Physiology, Thompson Brooks/Cpole, 2005
- **Knut Semidt-Nielson**, Animal Physiology 5th ed, Cambridge Low Price Edition
- **Richard A. Glodsby, Thomas J Kind, Barbara A. Osborne, Janis Kuby,**
- Immunology 5th ed. Freeman and C
- **Ivan Roitt, Immunology**, 4th ed, Johanthan Brostoff, Mosby, London.
- **Thomas C. Chung,** General Parasitology Hardcourt Brace and Co ltd. Asia. New Delhi
- **Gerard D. Schmidt and Larry S Roberts**, Foundations of Parasitology ,McGraw HillKmdt, T. **J., Goldsby, R. A., Osborne, B. A., Kuby, J. (2006).** VI Edition. Immunology. W H. Freeman and Company.
- **Delves, P. J. Martin, S. J., Burton, D. R., Roitt, I.M. (2006).** XI Edition. Roitt's Essential Immunology. Blackwell Publishing.

CHAIR PERSON
Board of Studies in Zoology
Osmania University, HYD-7.

Government Degree College for Women, Begumpet, Hyd.
Autonomous (CBCS)
B.Sc. III year Zoology syllabus. 2018-2019
Semester VI DSE- II(A)- PAPER- VIII
AQUATIC BIOLOGY

Max. Marks: 75

Periods: 60

(15 periods)

UNIT – I Aquatic Biomes

1.1 Brief introduction of the aquatic biomes
1.2 Freshwater ecosystem (lakes, wetlands, streams and rivers).
1.3 Estuaries, intertidal zones.
1.4 Oceanic pelagic zone, marine benthic zone.

(15 periods)

UNIT – II Fresh Water Biology

2.1 Coral reefs
2.2 Lakes: Origin and classification of lakes
2.3 Lake as an Ecosystem, Lake morphometry
2.4 Physico-chemical Characteristics of fresh water bodies: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity, dissolved gases (Oxygen, Carbon dioxide).

(15 periods)

UNIT – III Marine Biology

3.1 Nutrient Cycles and Lakes- Nitrogen, Sulphur and Phosphorous.
3.2 Streams: Different stages of stream development, Physico-chemical environment, adaptation of hill stream fishes.
3.3 Salinity and density of sea water, Continental shelf, Adaptation of deep sea organisms, Sea weeds.
3.4 Eutrophication

(15 periods)

UNIT – IV Management of Aquatic Resources

4.1 Aquatic pollution – Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills.
4.2 Management and conservation
4.3 Water pollution acts of India
4.4 Sewage treatment and water quality assessment – BOD and COD

References

1. Ecology – P. Odum
2. Ecology and environment – P D Sharma
3. Fundamentals of Ecology- P Odum and Gary W. Barrett

CHAIR PERSON
Board of Studies in Zoology
Osmania University, HYD-7.