

SCHEME OF EXAMINATION FOR
HONS. DEGREE STANDARD

SUBJECT	Duration	Maximum
	Marks.	
A. SCREENING TEST (OBJECTIVE TYPE).		
General Studies and Mental Ability	150 Questions.	2 1/2 Hrs. 150
B. MAIN EXAMINATION (CONVENTIONAL TYPE).		
a) Compulsory Subjects:		
1. Paper - Essay	3 Hrs.	150
2. Paper - General English	3 Hrs.	150
3. Paper - General Studies (Essay type)	3 Hrs.	150
b) Optional Subjects: (List of Optional Subjects is given in NB.:6) (Two Optional Subjects comprising two papers each)		
4. First Optional - Paper-I	3 Hrs.	150
5. First Optional - Paper-II	3 Hrs.	150
6. Second Optional - Paper-I	3 Hrs.	150
7. Second Optional - Paper-II	3 Hrs.	150
C. ORAL TEST (INTERVIEW).		115

N.B:- 1. Question Paper for Screening Test will be supplied in Telugu and English only as desired by the candidate in his/her application.

2. Screening Test is intended to shortlist the number of candidates to be admitted to Written Examination and the marks secured in this Test will not be counted for Ranking.

3. The number of candidates to be admitted to the Written Examination(Conventional Type) would be 50 times to the total number of vacancies available at material time irrespective of Communities.

4. The Paper of General English is a qualifying one and the standard of this paper is that of S.S.C. The marks secured in this paper are not counted for ranking.

5. The Papers under written examination except Paper-2 i.e., General English may be answered in English or Telugu or Urdu as chosen by the candidates. However, a candidate is not permitted to write part of the paper in one language and part of it in another language.

1. Political Science and Public Administration
2. Commerce and Public Administration
3. Anthropology and Sociology
4. Mathematics and Statistics
5. Agriculture and Animal Husbandry and Veterinary Science.
6. Of the Engineering Subjects not more than one subject is allowed to be offered.

SYLLABUS FOR SCREENING TEST.

PAPER-I

GENERAL STUDIES AND MENTAL ABILITY - 150 Marks - 150 Mts.

1. General Science - contemporary developments in science and technology and their implications including matters of everyday observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.
2. Current events of national and international importance.
3. History of India - emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on A.P. Indian National Movement.
4. World Geography and Geography of India with a focus on A.P.
5. Indian Polity and Economy - including the Country's political system, rural development, planning and economic reforms in India.
6. Mental ability - reasoning and inferences.

PAPER-II:

ONE OPTIONAL SUBJECT:- Candidate should choose ONE Optional Subject from the following:

- | | |
|---------------------------|---|
| 1. Psychology | 2. Physics |
| 3. English Literature | 4. Geology |
| 5. Sociology | 6. Statistics |
| 7. Commerce | 8. Agriculture |
| 9. Anthropology | 10. Chemistry |
| 11. Botany | 12. Economics |
| 13. Indian History | 14. Zoology |
| 15. Geography | 16. Political Science |
| 17. Public Administration | 18. Law |
| 19. Philosophy | 20. Mathematics |
| 21. Hindi Literature | 22. Telugu Literature |
| 23. Urdu Literature | 24. Animal Husbandry & Veterinary Science |
| 25. Social Work | 26. Home Science. |

OPTIONAL SUBJECTS :: SYLLABUS

PSYCHOLOGY

1. Psychology - Definition, Scope and Branches, Methods of Psychology, Introspection, observation, Interview. Experimental Methods Variable, Experimental Control, Methods of Establishing Experimental Control.
2. Concepts of Growth, Development and Maturity; Role of Heredity and environment in the development process, Mendelian theory and twin studies, General Principles of development and factors influencing development.
3. Sensation and perception, perception - Definition. Nature, Theories of perception, Atomistic approach, Gestalt point of view Early and Modern; Directive State Theory; Perceptual processes - Depth perception. Perceptual constancies, perceptual contrast.
4. Learning - Theories of learning - Thorndike's trial and error learning - Thorndike's laws of learning and their revision; Pavlov's theory of conditioned learning - experimental neurosis - Skinner's operant conditioning; Schedules of reinforcement instrumental Learning - Hull - Transfer of learning.
5. Remembering - Learning curve, Ebbinghaus, curve of retention - Measures of retention, efficient methods of learning.
6. Forgetting - Factors causing Forgetting - Emotional and Motivational, Social Interference from later activity.
7. Motivation, Role of Motivation in perception and learning - concept of Homeostasis McClelland's Theory of Achievement Motivation.
8. Thinking, Peripheral and central theories of thinking, problem solving, concept formation - Piaget's studies.
9. Personality - Definition - Trait approach - Typology - Psychoanalytical approach - Freud; personality disorders a comparison of psychoneurosis and psychosis.
10. Psychological testing, History of Mental testing Movement - requisites of a good psychological test; classification of psychological tests; Intelligence testing - Definition of intelligence; Spearman's two factor theory - Thurstone's Multifactor Theory, concept of I.Q. - Constancy of I.Q. Aptitude testing - Types of aptitude tests and their uses, interest inventories and their uses - Assessment of personality - Inventories - Projective tests.
11. Groups - Kinds of groups - Formation of groups - Mass Behaviour, Audience, Mobs, Crowds, Leadership - Types of leadership - Traits of leadership.

PHYSICS

1. Mechanics and properties of matter:
Circular Motion, Centripetal and Centrifugal forces and applications. Rotational motions, Kinetic energy of rotating bodies movement of inertia. Universal law of gravitation, determination of gravitational constant (G) moduli of elasticity and their determination.
2. Heat and Thermodynamics:
Temperature and its measurement, resistance and Thermo-electric Thermometers. Two specific heats of a gas and their determination Vander Walls equation, critical constants, liquification of gas, Joule Thomson effect, adiabatic demagnetisation Carnot cycle second law of Thermodynamics, entropy.
3. Optics:
Defects in image formation by lenses and mirrors, Spherical and chromatic aberration, achromatic combination of lenses Dispersion of light Spectrometer, Interference of light Young's experiment, Fresnel's biprism, diffraction of light diffraction grating, resolving power, polarisation, polarimeter.
4. Electricity and Magnetism:
Inverse Square Law in electricity and magnetism and their verification, electrometer, condensers and determination of their capacity Units of current, potential and resistance. Moving coil galvanometer

Ammeter and Voltmeters. Inductance power factor of an AC circuit. CR circuit transformer and its applications.

Modern Physics:

Planck's theory of radiation, photoelectric effect, discovery of X-rays, Thomsons discovery of electrons, atom models, Bhors theory of spectral lines, Discovery of a radioactivityneutron and building up of nucleus, binding energy, fission and fusion.

ENGLISH LITERATURE

PART-I:

1. Elizabethan Drama.
2. Age of Milton.
3. Restoration Drama.
4. Neo-Classical Age - Prose & Poetry.
5. Romantic Age - Wordsworth, Byron, Shelley and Keats.
6. Victorian Age - Tennyson, Browning Ruskin and Carylyle.
7. Post Victorian Age - Hardy Shaw and T.E.Eliot.

PART-II:

1. Literary Criticism - Dryden, Johnson, Coleridge and Mathew Arnold.
2. Literary Forms - Sonnot, Elegy, Ode Dramatic monologue, Novel and Essay.

GEOLOGY

1. PHYSICAL GEOLOGY:

1. Study of origin, structure and the age of the earth Geological action of Wind, rivers, glaciers, lakes and oceans, Earthquakes and Volcanoes continental Drift, Isostasy and Plate Tectonic Groundwater.

2. STRUCTURAL GEOLOGY:

Study of different types of folds, faults unconformities and joints.

3. STRATIGRAPHY:

Broad principles of stratigraphy, India Stratigraphy with special reference to Andhra Pradesh Chronological Sub-division of Geological record. Fossils - Their classification and mode of preservation. Study of major invertebrate and plant fossils.

4. PETROLOGY:

Origin, structure textures and classification of Igneous, Metamorphic and Sedimentary Rocks. Description of Major Indian rocks types with special reference to their occurrence in Andhra Pradesh.

5. MINEROLOGY AND CRYSTALOGRAPHY:

Broad classification of crystals. Elements of symmetry, study of crystals with reference to normal class of each system. Twinning Study of major groups of rock forming minerals with reference to their physical chemical and optical properties.

6. ECONOMIC GEOLOGY:

Principles of ore genises. Classificaion and Geology of Chief metallic and non-metallic minerals in India. Mineral wealth of Andhra Pradesh.

SOCIOLOGY

1. Nature of Society, Holism and Atomism the animal and human society - Language and human society.
2. Nature and scope of sociology - Methods of sociology sociology and the Social Science - Sociology and Philosophy.
3. The natural order and human society individual and society; theories of society; social contract theory; organisamic theory and group mind theory, Sociology and Ecology.
4. the Social system - Status and Role, Social stratification and Bases, Forms of stratification - Social differentiation.
5. Social interaction and social processes basis of social interaction, interests and Motivation - Forms of social processes associative and disassociative - Accommodation and Adjustment, Assimilation and Cooperation - Competition and Conflict.
6. Socialisation - Theories of Socialisation - Agencies of Socialisation - Social learning and imitation, rewards and punishment.
7. Nature and scope of social control means and agencies of social control - Social control and changing social situation.
8. Poverty and unemployment, social and moral hygiene prostitution and Alcoholism.
9. The concept of family joint family and its types - Advantages and disadvantages breakdown of joint family, causes and trends, Status of Woman-Child marriage, widow marriage, divorce, dowry, Sati and social seclusion - Law of Inheritance.
10. Basic Social Institution - Marriage, family and Kinship Economic Institutions and division of a labour.

STATISTICS

1. Empirical frequency distribution of one variable graphical and diagrammatic representation of data, collection and classification of data measures of central tendency measures of dispersion moments, Skewness and Kurtosis.

Statistical regularity of change phenomena, relative frequency interpretation of probability, probability on discrete sample space and their basic properties, addition theorem for probability conditional probability Bayes's theorem, stochastic independence, discrete random variable mathematical expectation, Binomial and Poisson distributions moment generating function.

2. Theoretical frequency distribution of one and two variables normal distribution and its properties, curve fitting of first and second degree polynomials, fitted by the method of least squares, correlation and regression.

Concept of a random sample, sampling distribution of sample mean and sample proportion for large sample, statistical hypothesis, concept of null-hypothesis types of errors, critical region, level of significance, the following tests of significance.

(i) Tests of population H, comparison of population means test for the significance of correlation based on t -test.

(ii) Comparison of population variance based on F-test.

(iii) Test for goodness of fit test for population variance χ^2 test of independence based on Chi-square test.

3. Principles of experimentation, completely randomized and randomized block designs.

4. Non-parametric tests, sign test, median test, Wilcoxon, Mann-Whitney test, run test for two sample problems, test of independence based on Spearman's Rank correlation coefficient.

Sampling, selection of a random sample, simple random sampling with and without replacement notion of stratified random sampling estimation of population mean total and variance.

Economic Statistics: Index numbers importance of index numbers and methods of their construction base shifting, splicing and deflation, Laspeyres's and Paasche's index numbers. Fisher's ideal index number of cost of living.

Time series and its main components, determination of trend by moving averages and curve fitting, determination of seasonal indices.

COMMERCE

ACCOUNTANCY:

1. Principles of double entry Book-keeping Journalising - Ledger Posting - Bank reconciliation Statement including overdraft.
2. Trial balance - Rectification of errors and suspense accounts.
3. Compilation of final accounts of Sole Traders and Partnerships.
4. Bills of exchange, consignments and Joint Ventures.
5. Account Current, average due date.
6. Single entry and self-balancing ledgers.
7. Royalties, hire purchase and instalment purchase.
8. Depreciation and Reserves.
9. Accounts of non-trading concerns.
10. Partnership accounts - Joint life policy, admission, retirement and death of a partner. Dissolution and conversion of partnership into a joint stock company.
11. Company accounts, share capital transactions including over-subscription, forfeiture and re-issue of forfeited shares - Business purchase - Issue and redemption - Profit prior to incorporation - Issue of Bonus shares - Final accounts.

BANKING:

- Role of Commercial Banks in a Developing Country - Meaning, purpose and achievements of Leed Bank Scheme.
- Role and functions of Central Bank.
- Banker and Customer - Nature of Relationship Handling of cheques; effect of forgery - When may or must a banker dishonour a cheque.
- Crossing and endorsement of Cheque - Types
- Special Types of Banker's Customers. Minor illiterate persons, Lunatics, Trustees, Joint Accounts, Clubs, Societies and Charitable Institutions.

EXPORT FINANCE:

- Letter of credit; Purchase of Export Bills Refinance facilities from Reserve Bank - Role of Export - Credit and Guarantee Corporation Ltd.

MERCANTIAL LAW:

1. LAW CONTRACTS:
 - (a) Offer - Acceptance - Consideration - Capacity to contract consensus adidem void, voidable and unforceable agreements - Discharge of contracts - Various modes - Determination of damages - Penalty and liquidated damages - quasi-Contracts.
 - (b) Special Contracts - Indemnity - Guarantee - Bailment - Agency.
2. SALE OF GOODS:
 - Sale and agreement to sell implied conditions and warranties - Consequences of breach rights and duties of buyer and seller - Rule of Caveaemtior, Position of unpaid vendor; passing of property.
3. ARBITRATION ACT:
 - Nature of arbitration agreement - Effect of Arbitration agreement - Matters excluded from the purview of Arbitration, Arbitration/Umpire. Appointment duties, powers remunerations. Arbitration with or without the intervention of Court.
4. INDUSTRIAL DISPUTES ACT:
 - (a) Meaning and definition of the terms industry, industrial dispute worker, appropriate Government, strike,lockout.
 - (b) Machinery for settlement of industrial disputes.
 - (c) Provisions regarding strikes, lockouts, lay off, retrenchment.

BUSINESS ADMINISTRATION:

1. Forms of Business Organisations:
(a) Sole trader, (b) Partnership, (c) Joint Hindu Family Firm, (d) Company, (e) Co-operative
- Comparative Evaluation of Business Organisations.
2. Company Management including Meetings and Resolutions.
3. Financial Planning - Methods of raising Finance - Institutions of Industrial Finance (a) IFC, (b) SFC and (c) ICICI.
4. Nature and Functions of Management - Scientific Management.
5. Methods of Remunerating Employees.
6. Insurance.
7. Channels of Distribution.
8. Salesmanship and Advertising.
9. Organisation of external trade.
10. Rationalisation.
11. Business Combinations.
12. Public Utilities.
13. Government and Business - Public Enterprise - Industrial Policy - Regional Development.

AGRICULTURE

INTRODUCTION TO AGRICULTURAL SCIENCES:

Importance of Agriculture and its products in the World and Indian Economy - Development of agriculture as a science in India - Geographical distribution of different crops - Major crops of India and Andhra Pradesh their acreage and production.

Meteorological elements and their measurements - Climate and weather - Monsoons and Agricultural seasons with special reference to Andhra Pradesh - Effect of weather elements on crops - Weather abnormalities.

SOIL AND TILLAGE:

Soils and their physical properties in relation to Crop Production - Texture, Structure aeration, temperature, soil humus, soil moisture, soil colour and soil depth - Tillage practices for different soil type and crop properties of ideal till - Preparation of seed bed implements used for seed bed - Preparation and intercultivation with special reference to Andhra Pradesh Scope of Mechanisation in Indian Agriculture.

SOIL FERTILITY AND ITS MANAGEMENT:

Concept of soil fertility, macro and micro plant nutrients, classification, their functions, occurrence, forms, availability and deficiency symptoms - Soil fertility evaluation and fertilizer recommendation for crops.

Definition, scope and meaning of soil fertility in relation to crop production - Soil fertility losses and its maintenance - Soil organic matter and C.N. ratios - Plant nutrients - Availability - Losses - Application and maintenance through organic manures and fertilisers - N.P. and K.fertilisers - green manuring - Composting - Use of other manurial resources. Special practices to maintain soil fertility - Crop rotation - crop mixtures - Multiple and relay cropping - Filling - Problem soils their reclamation and management.

Nitrogen assimilation and Nitrogen cycle - Sources of nitrogen - N fixation - Nitrogen fixing bacteria.

SOIL AND WATER CONSERVATION AND DRY LAND FARMING:

Soil erosion - Factors affecting erosion - Types of erosion - Methods of erosion control, agronomic, mechanical, forestry and agrastology - Distribution of rainfall and its importance in crop production - Dry land farming regions in India and Andhra Pradesh Technology for crop production in dry land farming.

IRRIGATION AND MANAGEMENT OF IRRIGATED SOILS:

Importance of irrigation - Area under irrigation in India and Andhra Pradesh - Climate - Soil plant - relations - Measurement of soil moisture - Consumptive use of water - water requirements of crops - Methods of irrigation - irrigation efficiencies - Measurement of irrigation water - Quality of irrigation water. Drainage and its importance in irrigation farming - Methods of drainage.

CROP PRODUCTION:

Principles of crop production - Concept of new plant types - Adaptation, distribution, area and production, varieties, soils, seasons, preparatory cultivation - Seeds and sowing, manures and fertilisers - Diseases and pests and their control. After cultivation Harvesting, processing and storage of the following crops.

Cereals: Rice, Sorghum, Wheat, Bajra, Ragi and Korra.

Pulses: Redgram, Greengram, Blackgram and Bengalgram.

Oilseeds Crops: Groundnut, Gingelly, Castor, Coconut, Sunflower, Safflower.

Fibre Crops: Cotton, Sunhomp and Gogu.

Sugar Crops: Sugar Cane.

Narcotic Crops: Tobacco.

Seasonal Spices: Chillies, Ginger, Turmeric and Coriander.

Fodder Crops: Important fodder crops and cultivated grasses of the State. Pasture management.

Horticultural Crops: Fruits and Vegetables.

WEED CONTROL:

Classification - Losses due to weeds - Principles of weed control - Crop-weed association - Methods of weed control - Weed control measures in major crops.

FARM MANAGEMENT:

Factors of Production - Land, Labour, Capital and Management - Recent trends in management of factors of production - Choice of farm enterprises - Types and systems of farming - Extensive and intensive cultivation - Farm records - Preparation of cropping schemes - Crop calendar - Cost of cultivation of important crops - Cultivation sheets and other farm records and accounts.

CYTOLOGY, GENETICS AND PLANT BREEDING:

1. Components of living cells and parts and their functions.
2. Mendelism - simple Mendelian ratios - modification F2 ratios.
3. Mutations, their induction and their utility in agriculture.
4. Reproductive systems and methods of breeding in relation to mode of reproduction.
5. Hybridization - Handling of hybrid material.
6. Hybridization in cross fertilized crops.
7. Utilization of heterosis.

ANTHROPOLOGY

1. Meaning and scope of Anthropology - The main division of Anthropology viz. Cultural Anthropology, Physical Anthropology, Palaeo Anthropology, Linguistic Anthropology and their contributions to the integrated study of man.

2. Concept of culture used in Anthropology - Structure of culture - Features of culture - Difference between culture and society.

3. Definition of tribe: Characteristic features of tribal societies - Features of food gathering, pastoral and food producing societies.

4. Outlines of Social Organisation of Tribal Societies - Major kin groups in tribal societies - Clan, Phratry, Moiety Dual Organization and its working - importance of Kinship in tribal societies - Indian Tribal Societies.

5. Marriage Rules: Exogamy, Endogamy, Preferential marriages - Marriage payments. Various types of acquiring a mate in tribal societies. Definition of family and its universality - Types of families and functions - Structure, features and significance of Hindu Joint Family, Changing Family System in India.

6. Salient features of tribal economic organisation - Concept of property in Tribal Societies - Types of property found in tribal societies. Rules relating to inheritance of property. Role of reciprocity and gift exchange in tribal economic organisation.

7. Forms of social control in tribal societies. Nature of Political Organization in Tribal Societies - Justice in tribal societies and role of Oaths and Ordeals.

8. Meaning of Applied Anthropology. Role of Anthropologist in tribal welfare administration - Relevance of Anthropology in Agricultural Development and health and family planning.

CHEMISTRY

INORGANIC CHEMISTRY:

1. RADIO ACTIVITY:

Composition of nucleus - Discovery of Radioactivity - Measurement of Radioactivity - Decay constant - Half Life - Average Life Radioactive equilibrium - Position of radioactive elements in the periodic table - Radioactive series - Determination of Avogadro's number - Age of minerals.

2. PERIODIC CLASSIFICATION OF ELEMENTS:

Significant development leading to the systemic classification of elements - Modern periodic tables - Periodic function of elements - Atomic volume - Atomic radio ionisation potential - Electronegativity.

3. HYDROGEN AND HYDRIDES:

Isotopes of hydrogen (heavy hydrogen - Heavy water - Tritium) ortho and para - hydrogen properties of molecular hydrogen, H₂.

Classification of hydrides - Ionic or salt like hydrides - Covalent hydrides - Metallic hydride or interstitial hydrides - structure of diborane.

4. S - BLOCK ELEMENTS:

Group-I - Alkali metals - Electronic configuration - Properties based on electronic configuration - Chemical properties - Solubility and hydration stability of carbonate and bicarbonate - halides - Principles of extraction of metals complex.

Group-II - Alkaline earth metals - Electronic Configuration General properties - Anomalous behaviour of beryllium - Chemical properties - Complex Principles of extraction of metals - Diagonal relationship.

5. P - BLOCK ELEMENTS:

Group-III - Electronic configuration - General properties - Electropositive character - Boron sesquioxide and other borates - The other Group-III oxides - Hydrides - Complex Principles of extraction of elements.

Group-IV - Metallic and non-metallic Character - differences between carbon, silicon and the remaining elements - General properties hydrides - halides - silicate - silicons - allotropy of carbon - graphite compounds.

Group-V - Electronic configuration and oxidation states - Bond type difference between nitrogen and other elements in the group - Ammonia liquid ammonia as a solvent - Oxides oxyacids of phosphorous.

Group-VI - Electronic structure and oxidation state - Differences between oxygen and other elements - Polymorphism - General properties of oxides and oxyacids of sulphur - oxyacids of selenium oxyhalides.

Group-VII - The halogen - Electronic structure and oxidation states general properties - Oxidizing power - reactivity of elements - Separation of the elements - Hydrogen halides.

6. INERT GAS ELEMENTS:

Occurrence - Isolation and uses of inert gas elements - Typical compounds of the noble gases.

7. D - BLOCK ELEMENTS:

Electronic Configuration - General properties - Trends in ionization potentials - Variable oxidation states - Magnetic properties - Colour-catalytic properties - Complex formation ability, interstitial compound formation (general treatment).

8. F - BLOCK ELEMENTS:

The lanthanide series - Electronic Structure - Lanthanide contraction effect on the neighbouring elements - Abundance.

Actinide Series: Position in the periodic table - physical and chemical characteristics of the elements - Further extension of the periodic table.

CO-ORDINATION COMPOUNDS:

Double Salts - and co-ordination compounds - Early theories of co-ordination compounds - Jaorgenses theory - Werner's co-ordination theory - Sidgwicks electronic interpretation. Effective atomic number concept - Introductory treatment theories of metal ligand bounding magnetic properties of co-ordination compounds with special reference to hydrates - Ammoniates, cyano complexes of Co Fe and Cr Detection of the complex formation - Factors effecting the stabilities of complex compounds - Uses of complexions in analysis.

10. Study of the following groups of elements (introductory) and their chief compounds:

- (a) Scadium - Yttrium - Lanthanum and Cerium
- (b) Titanium - Zirconium and hafnium
- (c) Vandium - Nioblum and Tantalum
- (d) Molybdenum and Tungsten
- (e) Thorium and Uranium

11. INDUSTRIALLY IMPORTANT COMPOUNDS:

Manufacture, properties and uses of the following:

Na_2CO_3 , NaOH , CO_2 , KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, NH_3 , HNO_3 and H_2SO_4 , Principles of extraction of metals impores of each metal extraction each metal from ore, properties of each metal and uses.

12. Metallurgy of iron, cast iron, wrought iron and steel, Mg, Al, Cu, Nil, Ag.

ORGANIC CHEMISTRY:

1. INTRODUCTION:

Classification and nomenclature of organic compounds - Structure and reactivity of organic compounds - Isomerism Cources.

2. ALKANES AND CYCLO ALKANES:

Isolation and fractionation of petroleum, cracking - methods of synthesis and reactions - beyers strain theory and confirmation of cyclo alkanes.

3. ALKENES AND ALKYNES:

Methods of synthesis and reactions - Mechanisms of electrophilic and free radical addition to double bond -1,4 addition to conjugated dienes - Synthetic applications of acetylene. Polymerisation.

4. ARENES:

Coal: Tar as a source of aromatic compounds - Structure of benzene and concept of aromatialy - Mechanism of electrophilic aromatic substitution - Orientation of substitution - Alky benzenes.

5. HALOGEN COMPOUNDS:

Methods of preparation of alkyl and aryl halides - Relative reactivity - Mechanism and nucleophilic substitution - Flourine compounds - Halo compounds as insecticides.

6. HYDROXY COMPOUNDS AND ETHERS:

Methods of preparation of alcohols and phenols - Manufacture of methanol, ethanol Phenol and glycerol - Reaction of hydroxy compounds, Oxidation of hydroxy compounds - Preparation of ethers and cleavage of the linkage.

7. CARBONYL COMPOUNDS:

Methods of preparation of aldehydes and Ketones - Addition and condensation reactions - Mechanism of nucleophilic addition - Carbanion additions - Oxidation and reduction.

8. CARBOXYLIC ACIDS AND THEIR DERIVATIVES:

Preparation and reactions of carboxylic acids Acidic nature - Mechanism of esterification and hydrolysis - Reactions of acid chlorides and hydrides and amides - Preparation and synthetic applications of ethyl acetate and diethyl malonate - Introductory treatment lipids.

9. STEREO CHEMISTRY:

Conformational isomerism of alkanes and cyclo-alkanes- cis trans isomerism of compounds contains C=C, C=N, and N=N Stereo specific reactions - Criteria for optical activity - enantiomers and diastereomers - Resolution of racemic mixtures.

10. NITROGEN COMPOUNDS:

Preparation reactions and methods of distinguishing aromatic and aliphatic amines - Nitrocompounds and alkyl nitrites - Reduction products of nitrobenzene - Cyanides and isocyanides.

11. AMINE, ACIDS, POLY PEPTIDES AND PROTEINS:

Preparation and characteristics of amino acids - natural and essential amino acids, formation of polypeptides - importance of Polypeptides and proteins.

12. CARBOHYDRATES:

Classification, Structure of glucose, fructose and lactose - Configuration and cyclic structure of glucose and fructose - Study of sucrose, maltose and cellobiose structure of starch and cellulose - Importance of cellulose derivatives.

13. ORGANO-METALLIC COMPOUNDS:

Reactivity of Carbon metal bond, synthetic uses of organomagnesium and Zinc compounds.

14. STRUCTURE DETERMINATION:

Purity - Physical properties - Detection and determination of Elements - Molecular weight determination - Empirical and molecular formula - Tests for functional groups - Use of U.V. and I.R. spectra in structure determination.

15. HETEROCYCLIC COMPOUNDS AND ALKALOIDS:

Methods of synthesis and properties of furan, thiophene pyrrole and pyridine - Isolation and structure determination of alkaloids - Piperine, nicotine, narcotine and quinine.

16. TERPENES:

Isolation and methods of structure determination - study of a cyclic and monocyclic monoterpenes - Citral, Terpenil, Camphore, Pinene.

17. DYES:

Colour and chemical constitution - Synthesis and application of azo and quinonoid dyes - Structure of indigo and alizarin.

PHYSICAL CHEMISTRY:

1. STRUCTURE OF THE ATOM:

Fundamental particles - Hydrogen spectrum - Ritz combination principle - Bohr's model of the Hydrogen atom ionization potentials - quantum numbers. Wave nature of the electron - Broglie's equation - Heisenberg's uncertainty principles. Shapes of atomic orbitals - Distribution of electrons - Pauli's exclusion principle Hund's rule of maximum multiplicity - Electronic configuration of atoms.

2. CHEMICAL BONDING:

Ionic compounds and electrostatic bonding. Lattice energies of ionic crystals; Born-Haber Cycle - Electron pair bond - Covalent Compounds - Overlap criterion of bond strength Hybridization - Bond energies and electronegatives.

3. GASES:

Gas Laws: Boyle, Charles, Avogadro's, Graham's and Gay Lussac's Law - Kinetic theory of gases, deduction of gas laws from kinetic theory of gases - Average r.m.s. and most probable velocity of molecules - Distribution of molecular velocities (no derivation) - frequency of collisions, collision diameter and mean free path. Compressibility factor, Van der Waals equation of state. Specific heats of gases - Principle of equipartition of energy, Critical phenomenon principle of continuity of state - Determination of Van der Waals constants from Critical constants - Principle of corresponding states - Liquefaction of gases.

4. LIQUID STATE:

Vapour pressure of liquids and its measurement - variation of V.P. with temp. - Heat of vapourisation of liquids - Surface tension and its measurement variation of S.T. with temp. Viscosity and its measurement.

5. SOLID STATE:

Various types of crystal systems, properties of crystals - Bragg's method of crystal analysis.

6. SOLUTIONS:

Concentration units molarity, molality, normality, formality and mole fraction. Types of solutions; Henry's law, ideal solution, Raoult's law vapour pressure of liquid pairs. V.P. of miscible liquids, Boiling point, diagrams of completely miscible solutions - Azeotropic mixture; Fractional distillation - Partially miscible liquids critical solution temperature (maximum and minimum type) - Principle of Steam distillation.

7. COLLIGATIVE PROPERTIES OF SOLUTIONS:

Lowering of V.P. and Raoult's law - Determination of V.P. lowering elevation of V.P. and depression of F.P. - Calculation of Molecular weights of non volatile solutes from lowering of V.P. elevation in B.P. depression in F.P. data - Osmosis, Osmotic Pressure, measurement of Osmotic pressure Van Hoff's equation for osmotic pressure, relation of osmotic pressure of vapour pressures molecular weight calculation from Osmotic Pressure - Theories of Osmotic Pressure. Abnormal molecular weights.

8. COLLOIDS:

Colloidal dispersions, sols and their preparation and purification - Kinetic opticals and electrical properties of sols. Precipitation of sols Emulsions Gels properties of macro molecular solutions. Determination of molecular weight by Osmometry light scattering and viscosity measurements.

9. THERMODYNAMICS:

Energy and enthalpy state function. Energy and enthalpy changes in a system. 1st Law of Thermodynamics. Application to ideal gases - Heat capacity of gases C_p and C_v . Isothermal and adiabatic processes. Reversible and irreversible processes - Maximum work, work done in any adiabatic or isothermal expansions of gas. Joule Thomson effect. Heat of reaction and its variation with temp. (Kirchoff's equation) Thermo-chemistry; Thermo-chemical equations and its usefulness in calculation. H of reactions. Second Law of Thermodynamics. Conversion of heat into work. Carnot Cycle, Entropy change - Molecular concept of entropy. Free energy change - Conditions for equilibrium.

Free energy changes and equilibrium constant - Variation of equilibrium constant with temp. Gibbs Helmholtz equation. Clausius and Clapeyron equation.

10. ELECTROLYTIC CONDUCTANCE:

Electrolytic conductors. Mechanism of electrolysis - Faraday's laws of electrolysis. Transport number and its determination. Measurement of electrolytic conductance. Variation of conductance with concentration - Kohlrausch Law. Conductance of weak electrolytes. Ostwald's dilution law. Application of Conductance measurements. Common ion effect solubility product and its application. Hydrolysis degree of Hydrolysis, hydrolysis constant and its determination.

11. ELECTROMOTIVE FORCE:

Reversible and irreversible cells, e.m.f. and its measurement. Standard Cells, single electrode potentials, calculation of cell e.m.f. from single electrode potentials.

12. CHEMICAL KINETICS:

Rate, rate law, order and molecularity of a reaction rate, determining step. First, Second and Third order reactions. Methods of determining the order of a reaction, effect of temperature on rate. Arrhenius equation. Collision theory uni and bimolecular reactions. Catalysis, homogenous and heterogeneous catalysis. Mechanism of catalysis and characteristics of catalysis.

13. PHOTO-CHEMISTRY:

Lambert and Beer's law, Grouthus - Draper Law, Einstein's law of photo-chemical equivalence. Consequences of light, absorption by atoms and molecules. Experimental technique Actinometry, H_2 Cl_2 and H_2 - Br_2 reactions.

14. EQUILIBRIUM:

Reversible reactions equilibrium, equilibrium constant calculation of K_c and K_p and their relation. Effect of concentration temperature and pressure on the equilibrium K_c and K_p and Le Chatelier's principle. Variation of equilibrium constant with temp. Heterogeneous equilibria.

15. PHASE RULE:

Terms involved, application to one component and two component systems.

16. Nernst distribution law and its application.

Physical properties and chemical constitution; Dipole moment molecular polarisation - Measurement of dipole moments. Application of dipole moment to structural problems. Application of u.v. and i.r. spectra in the elucidation of structure of molecules.

18. Absorption of Gases on solids; Freundlich and Langmuir absorption.

BOTANY

1. Introduction of cell structure. The structure of cell organelles and functions.
2. Cell Division - Mitosis and Meiosis.
3. Tissue systems in plants - their origin and function.
4. Classification and taxonomy of plants - General character of major groups.
5. Types of reproduction and life cycle met with plants.
6. Plant Nutrition - Nutritional requirements - Deficiency symptoms forms of nutrition.
7. Absorption and transport in plants.
8. Mechanism of photosynthesis, photolysis, carbon fixation.
9. The patterns of respiration, energy transfer - Energy requirements.
10. a) Nitrogen Cycle b) Growth promoting substances in plants.
11. Enzymes - Their role - Vitamins, their functions.
12. Mendelian inheritance - Mechanism of inheritance.
13. Structure of DNA and RNA.
14. Genetic Code.

15. Protein Synthesis.
16. Regulation of gene action - Non-mendelian inheritance.
17. Mechanism of Evolution - Evidences of Evolution.
18. Basic Ecological concepts - Characteristics of Hydrosere, Xerosere - Ecology of Tropical forest.
19. General account of Bacteria and Viruses and their significance.

ECONOMICS

1. Nature and Scope of Economic Analysis.
2. Micro and Macro Economics.
3. Economic Systems - Capitalism, Socialism and Mixed Economy.
4. National Income - its components - The inter-relationship between these.
National Income, Methods of computation of National Income - various related concepts - The relevance of these to act as indices of economic development.
5. Production and pricing in a Micro system.
 - i) Consumption, its meaning - The problems of a consumer.
 - ii) Consumer equilibrium - Cardinal utility and the law of diminishing marginal utility. Derivation of individual and market demand functions.
 - iii) Defects of Cardinal utility - Ordinal utility and indifference curves. The properties of indifference curves. The law of diminishing marginal rate of substitution, income substitution and price effects - Derivation of individual and market demand curves.
 - iv) The law of demand - The assumptions behind it.
6. Production Process: Factors of production and the traditional classification of these into four categories - The law of variable proportions. Theories of population.
Cost Curves - Total, Average and Marginal Cost - Short run and long run cost curves. Derivation of individual and market supply curves.
7. The concept of Price Elasticity: Elasticities of demand and supply - Measurement of elasticity - Constant elasticity demand and supply curves.
8. Pricing Process: Markets, their classification and characteristics of each. Equilibrium of a firm under conditions of competition, monopoly and monopolistic competition. Discriminating monopoly - Imperfect competition and advertisements.
9. Distribution: Marketing Production - Theory of Distribution and its defects - the Cardinal Theory of Rent - Quasi - rent - Interest Theories of Marshall, Robertson and Keynes - Theories of Profit.
10. Characteristic Features of under development: The use of inferior techniques - The importance of Planning for Development. The problem of planning in mixed economics - Importance of Investment and its allocation. The production of inessential goods and their effects on the economy - Choice of goods and choice of techniques. The importance of intermediate technology.
Balanced versus Unbalanced growth.
11. Theory of Central Banking: The main functions of Central Bank of Banks, instruments of Monetary policy - Quantitative and Qualitative credit controls in a planned economy.
Devaluation and condition under which it should be done.
12. Theories of International Trade: Balance of Payment and Balance of Trade - The importance of foreign trade and aid in planned economy development, foreign trade and bottleneck resources.
13. Public finance and its main branches: Taxation for public revenue and the canons - Taxation and functional finance, public expenditure - Guidelines for public expenditure - Contracyclical Public Expenditure policies.
Public Debt - The concept burden and quity - Public Debt and economic development.
14. Elements of Feral Finance.
15. Development of Public Enterprises in India.

INDIAN HISTORY

Sources of Indian History, Geographic feature and Indian History - Indust Civilisation - Rigvedic and Post-Rigvedic Civilisation. India in the 6th century B.C. - Jainism, Buddhism, Rise of Maghada,

Alexanders invasion - Indo-Greek Kingdom - The Mauryan period - Mauryan Administration, Kushans.

South India Satavahanas, Chalukyas - Pallavas, Cholas, Greater India.

Imperial Guptas - Gupta Administration - Harshavardhana - Rajput Kingdom in Northern India.

The Delhi Sultanate - The Slave dynasty - The Khiljies - Allauddin Khilji Reforms - The Tuglaks - Mohammed Bin Tuglak Feroze Tuglak - Reforms - Impact of Hinduism and Islam on one another - The Bhakti cult - Ramananda - Chaitanya, Meera, Kabir, Nanak, Sufis.

Economic conditions in Medieval India - Dynasties of the South Yadavas - Kakaktiyas - Hoyasalas - Pandavas - Literature Art - The Vijayanagar Empire - Foundations and origins - Krishna Deva Raya - Government Art and Literature, India at the time of Baber's invasion - Causes for the success of Baber at Panipat - The Moghuls.

The Moghuls (Political, Social and Economic aspects) - The rise of Marathas, Shivaji - Early European Traders and their factors in India - Anglo-Fresnch Rivalry - Rise of British power in India - The Regulating Act - Clive, Warren Hastings - Mysore and Maratha Wars. Pitt's Indian Act and Permanent Revenue Settlement.

Hyder Ali and Tippu Sultan of Mysore - British Paramountry - Wellensive Subsidiary Alliance.

Rise of Sikh power - Expansion British Dominations beyond Sutlej and Brahmaputra - Dalhousie - The Indian War of Independence, 1857. Bentick - Social Reforms Movement. Inia under the crown Minto - Ripson Rise of Indian Nationalism - The three phases of India's Freedom struggle - Home Rule Movement - Growth of Muslim Separatism - India and Independence.

The Gandhian era in the freedom movement - Contribution of Mahatma Gandhi towards the evolution of Indian Nationalism. The Gandhian views on non-violence - Education, Economics, Untouchability, Women's upliftment, Sarvodaya etc.

ZOOLOGY

Section A

(Non-Chordata and Chordata)

1. NON-CHORDATA:

Phylum Protozoa: Parositic amebia, Plasmodium, Trypanosoma, Paramaeciu, Elphidium.

Phylum Prolifera: The systematic position of sponges, canal system, skeleton and reproduction in sponges.

Phylum Ceolenterata: Concept of polyp and medusa; phenomenon of polymerphism (siphonophora), corals and coral formation. Catenophores and their systematic position.

Phylum Platyhelminthes: Fasciola, Taenia prastic adaptation in termatodes and ceztodes.

Phylum Nemaheiminthes: Ascaries Strongyloides Wuchereria Dracunculus.

Phylum Annelida.

Nephidrial system in Annelids. Reproduction in Annelida.

Phylum Orthopoda: Mouth parts of mosquito. House fly appendages of Prawn, Incests and their economic importance.

Peripatus, its structure, general organisation and systematic position.

Phylum Mollusca: Unit (fresh water mussel)

Phylum Echinodermata: Echinoderm larvae, water vascular system.

Phylum Hemichordata: Systematic position of Hemichordaters.

2. CHORDATA:

Uruchordata: Herdmania, Retrogressive metamorphosis.

Cephalochordata: Amphioxus - general character and affinities only.

Class Pisces: General characters of chondrichithyes and osteichthyes, distinctive features of crossopterygi Latimsasa (coelcanth fish) Lung fishes, Dipnofishes and their importance mankind.

Clas Amphibea: General characters of Anura, Urodela and Apoda.

Class Reptillia: The outline classification of Reptiles with general characters of chelonia; squanata, crocodilla, Dinosaurs, Poisons and non-poisonous snakes of India.

Class Aves: Adaptations of flight.

Class Mammalia: General characters and distribution of Prototheria; Metatheria and Eutheria; Distribution of Marsupials; Flying mammals, Aquatic mammals.

Embryology: The development of Amphibian frog, chick and Rabbit, Fate maps, inductors and inducing mechanism.

SECTION B

(General Biology; Genetics; Cytology and Ecology)

GENERAL BIOLOGY:

- a) Evolution: Origin of life: theories of Evidence of Organic Evolution, Speciation.
- b) Palaeontology: Phylogeny of Horse.
- c) Zoogeography: The Zoogeographical realms and the fauna of various Zoogeographical regions.

GENETICS:

Heredity, Mendelism, Linkage, Sex linkage, crossing over.

CYTOLOGY:

Ultra structure of a cell and cell organelles with their structure and functions. The structure of chromosome, Prokaryotic and Eukaryotic cells.

Nucleic acids DNA; RNA; Protein synthesis.

ECOLOGY:

The concept of ecology, ecosystems (Aquatic and terrestrial); Ecological pyramids; web of life.

ORGANISMAL PHYSIOLOGY:

1. Physiology of digestion.
2. Physiology of Muscle contraction.
3. Physiology of Excretion and Osmo-regulation.
4. Cellular Metabolism.

GEOGRAPHY

PART-I PHYSICAL GEOGRAPHY:

1. Kinds of Rocks - Classification and Distribution.
2. Origin Classification and Distribution of Mountains, Plateau and Plains.
3. Earthquakes and Volcanoes.
4. Land forms - Work of River, Glacier, Wind, Underground water.
5. Solar Insolation - Factors affecting distribution of temperature.
6. Pressure belts and Planetary Winds, Monsoons.
7. Precipitation - Types and Distribution.
8. Ocean currents, tides.
9. Study of natural regions with special reference to (i) Equatorial, (ii) Hot Desert, (iii) Mediterranean and (iv) Tropical Monsoon.

PART-II ECONOMIC GEOGRAPHY OF INDIA WITH SPECIAL REFERENCE TO ANDHRA PRADESH.

1. Physical setting - Relief, Climate, Soils.
2. Natural Resources - Forest Wealth, Minerals with special reference to Coal, Iron Ore, Petroleum.
3. Irrigation - Types and Distribution - Major Multipurpose Projects of India.
4. Agriculture - Major crops of India and Andhra Pradesh.
5. Industrial Development - Sugar, Cotton, Textiles, Machine Tools and Ship Building.
6. Transport and Communications - Roads, Railways, Inland Water Ways and Major Ports.
7. Growth and Distribution of Population - Urban and Rural.

PART-III REGIONAL GEOGRAPHY:

1. A Geographical study of the following countries: Indonesia, Pakistan, Iran, Great Britain, Japan, U.S.A., Bangladesh and Australia.

POLITICAL SCIENCE

1. State - Elements of State - Characteristics of Modern State.
2. Rights and Duties of the citizens; and significance of liberty and equality.
3. Law - Law and Liberty - Rule of Law and Administrative Law.
4. Forms of Governments - Democratic and Authoritarian Unitary and Federal.
5. Theory of Separation of Powers - Executive Cabinet and Presidential, Executives, Legislature, Bicameralism, Judiciary and Judicial Review.
6. Methods of representation - Direct Democratic devices.
7. Political parties and their role in Parliamentary Democracy.
8. Local Government; Panchayat Raj; Organization and functions.
9. United Nations Origins and Aims; and its main organs.
10. Ideologies, Utilitarianism, Individualism, Anarchism, Fascism, Socialism, Marxism, Communism, Gandhian Philosophy.

PUBLIC ADMINISTRATION

THEORY OF PUBLIC ADMINISTRATION:

Public Administration in a developing Society - Chief Executive functions, role - Organisation - Definition.

Types of Departments; and Corporations - line and staff Hierarchy - Span of Control - Unity of Command Centralisation and Decentralisation.

Personnel Management - Recruitment, methods and agencies, promotion, training - morale.

Financial Management - Budget making Parliamentary Control, Juicial control over administration.

Public Relations.

Administrative Reforms O and M.

INDIAN ADMINISTRATION:

The Constitutional framework of Indian Administration.

Preamble of the Indian Constitution - Fundamental Rights - Directive Principles of State Policy.

Machinery of Government - Federal and Unitary features.

Parliamentary form of Government.

Legislative, Executive and Judiciary at the Central and State levels.

ADMINISTRATIVE SYSTEM:

Cabinet - Cabinet Sub-Committees - Cabinet Secretariat - Ministries Home and Finance - National Development Council - Planning Commission, Finance Commission. The Public Service - All India Services, Central Service and State Service.

Department of Personnel and Administrative Reforms.

Union Public Service Commission.

Comptroller and Auditor-General.

STATE ADMINISTRATION:

General Administration Department.

Secretariat and Directorate.

Board of Revenue.

District Administration - District Collector.

Rural and Urban Government and Administration.

LAW

CONTRACT

INDIAN CONTRACT ACT, 1872 - GENERAL PRINCIPLES - SECTIONS 1-75 TOPICS:

1. Proposal and acceptance, Capacity to Contract Consideration, Free Consent and Legality of object.
 - a) Proposal and acceptance, Definition, when is proposal and acceptance complete and when can they be revoked difference between the English and Indian Law.
 - b) Capacity to contract - what it means minor as party to an agreement.
 - c) Consideration - Definition Rules as to consideration.
 - d) Free Consent .. Coercion, Undue influence, Fraud, Misrepresentation, Mistake.
 - e) Legality of object.
2. Discharge of a Contract.
3. Quasi Contract.
4. Damages .. Principles governing assessment of damages, distinction between liquidated damages and penalty.

TORTS

PART 'A' GENERAL PRINCIPLES:

1. Nature of tortious liability.
2. Who cannot sue and be sued.
3. Defences to an action in tort.
4. Vicarious Liability.
5. Remedies to an action in tort and remoteness of damage.
6. Liability of Joint tortfeasors.
7. Survival of actions - Death in relation to tort.

PART 'B' SPECIFIC TORT:

1. Defamation.
2. Nuisance.
3. Negligence - Nervous shock liability of occupiers of premises.
4. Strict liability - Rylands vs. Fletcher.

JURISPRUDENCE:

1. Scope, nature and definition and kinds of law.
2. Various theories of Law with special reference to imperative theory of law.
3. Sources of Law - Legislation, Precedent and Custom.
4. Rights and Duties.
5. Law of persons.
6. Liability, Crime and Torts.
7. Ownership and Possession.

THE INDIAN PENAL CODE:

1. Concept of Crime, Abetment, Conspiracy and Constructive liability. General defences, Criminal attempts. Offences of Public Tranquility Chapter (8) Sections 141 to 153.
2. Chapter VI of the Indian Penal Code dealing with offences against the State.
3. Chapter XVI of the Code dealing with offences against human body.
4. Chapter XVII of the Code dealing with offences against property defamation Chapter (20).

PHILOSOPHY

1. What is Philosophy? Its relation to religion and science.

2. Problems of reality and knowledge - Socrates, Plato and Aristotle.
3. Descartes method and dualism.
4. Locke-denial of innate ideas. Theory of the external world (Qualities and substance).
5. Berkely's subjective idealism.
6. Brief discussion of problems of Post Kantain Philosophers and existentialism.

INDIAN AND ISLAMIC PHILOSOPHY:

1. Characteristics of Indian Philosophy.
2. Sankhya-Purush, Loga, Prakriti and Evolution, Nyaya Vaisesika - Categories; Atomism (Vaisesika).
3. Vedantic Philosophy - Vedanta - Sankara's Advaita Vedanta - Brahman Maya, Jiva, Ramanuja's Visistadwaitavada - God, Maya vs. Advitiya, Jiva.
4. Buddhism - Momentariness, Pratiti - Samutpada. No self theory.
5. Origin and the development of Philosophy in Islam - Reason and Revolution (Conflict and attempts at Reconciliation, Mutazilities, Ashrities, Philosophers, Al-kind, Al-Farabi, Ibn-Sina and Ibn-Rushad).
6. Neo-Platenic influence on Islamic Thought, Al-Farabi and Ibn-sina, Ibn-Sina's theory of soul.
7. Problems of Ethics; Mutazilities and Asharities, Doctrine of Kasb, the Asharite solution.
8. The growth of the Sufi doctrine and the way of life ove Ghazali's attempt at reconciliation between orthodoxy and sufism.
9. Refutation of Philosophy; A brief study of Al-Ghazal.

MATHEMATICS

1. ALGEBRA:

Sets, Relations, Equivalence, Relations, Equivalence, Classes (Functions well definedness of the function, one-to-one inverse functions, and composition of function - Algebra functions, Statement of Peanon Axioms, properties of rational numbers)

Groups, Sub-groups, Cosets, Laranges theorem, Normal Sub-Groups, Factor Groups, Homomorphism and isomorphism of groups.

Defintion and illustration of Rings, Integral domains and fields.

Defintion and illustration of Vector spaces of two and three dimensions. Linear dependence and independence of vectors, Basis, Inner produce (Scaler dot), Orthogonal vectors, Length of a vector, orthonormal system. Reduction of linearly independent system of vectors to an equivalent orthonormal system in 2 Dimensions and 3 Dimensions.

Dot product of vectors, triple scaler and vector product Geometrial interpretation (angle between line area of a triangle, Vector equation of line, concurrence of lines by Vector method simple examples).

Matrices, symmetric, skew-symmetric and identity matrix, Algebra of Matrices, illustration theory of the tranformation of the type.

$$y_i = n, a_{ij} \quad x=1, 2, 3$$

$$W/d = 1.$$

Definition of rank of a matrix, determination of the rank of a mxn matrix, m,n,3. Definition of eigen values and eigen vector of a matrix, Eigen values of a symmetric matrix and eigen vectors of a symmertric with distinct eigen values. Solution of a cubic and a quadratic equation.

Elementary Number Theory: Fundamental Theorem of Arithmetic theorem of Fermat and Wilson.

2. ANALYSIS:

Limit of sequece and series, Cauchy's general princple of convergence. Definitions of limit and continuity of a function. Properties of continuous fuctions; Curvature in cartesion co-ordinates, Envelop of a one parameter family of curves. Rolle's theorem. Mean valued theorem. Cauchy's mean value theorem, Maximum and minimum, Taylor's Theorem, Maclaurins theorem.

Integration: Reduction formulae, Rimann's theory of definite integrals. First mean value theorem and fundamental theorem of integral calculus.

Rectification of a curve, quadreture, volume and surface area of solids of revolution. Trapezoidal rule, Simpson's rule for definite integration.

3. CO-ORDINATE GEOMETRY OF TWO DIMENSIONS:

Transformation of axes, standard form of Ellipse, Hyperbola and Parabola, Tangents, normals, poles and polars, Conjugate diameters, asymptotes and simple examples on the above topics. Reduction of second degree equation.

4. CO-ORDINATE GEOMETRY OF THREE DIMENSIONS:

Straight lines, Planes, Equation of a sphere, Centre and radius of Plane section of a sphere, Tangent, plane and normal at a point on a sphere.

5. DIFFERENTIAL EQUATIONS:

First order differential equations - Variable separables, Exac-Homogeneous, first order non-linear equations soluble for p, x, y Berot noullis equation. Calariut's form, Orthogonal tranjectories. Linear differential equations with constant co-efficients up to order 4 of the type.

$f(d) - ea \cos ax, \sin ax, xm.$
 $exa V$ where v is a function of X .

Homogeneous linear differential equations of simple type.

HINDI LITERATURE

1. Critical explanation of the two out of four passages from the following:
 - a) Ram ki Shakti Puja - Nirala.
 - b) Nisha Nimantran - Harivansh Rai Bachchan.
2. Critical Study of
 - a) Ajat Shatru - Jai Shankar Prasad.
 - b) Shrinkhala kikadiyan - Maha Devi Varma
3. Essay on Literary Topic.
4. Study of a Literary Form: Short Story
Manasarowar Part-I -Premchand.

TELUGU LITERATURE

1. Salient Feature of Modern period 1875 A.D. upto date, with special reference to the Development of Prose - Chinnayasuri, Veereshalingam, Chilkamarti and their followers.
2. Critical Study of Literary Forms - Drama and Novel with particualr reference to the following:

DRAMA:

1. Kanya Sulkam by Gurajada Appa Rao.
2. Pandavodyagam by Tirupati Kavulu.
3. Pratapa Rudreya by V. Venkata Raya Sastry.

NOVEL:

1. Ekaveera by Viswanatha Satyanarayana.
2. Chivaraku Migiledi by Buchchi Babu.
3. Asamarthuni Jeevayatra by Copichand.

LITERARY CRITICISM:

1. Definition of Fine Arts - Place of Poetry in Fine Arts.

2. Definition of Poetry - Poet and Poem (Kavya).
3. Classification of Kavyas.
4. Purpose of Poetry and Poems (Kavyas).
5. Alankaras (Sabda & Artha).
6. Rasa Theory - (Definition - Number of Rasas - Sthai Bhava,

etc.)

BOOKS FOR REFERENCE:

- | | |
|----------------------------|------------------------|
| 1. K. Narayana Rao | Veereshalinga Yugamu |
| 2. K. Seetha Ramaiah | Navyandhra Sahitya |
| P. Hanumantha Rao | Veedhulu |
| 3. M. Naga Bhushana Sarma | Telugu Navala Vikasam |
| 4. P. Venkateswarlu | Telugu Navala Vikasam |
| 5. Yuva Bharati | Telugu Novel |
| 6. S. Suryanarayana Sastry | Kavyalankara Sangraham |
| 7. D. Venkatavadhani | Sahitya Sopanamulu |
| 8. K.V.R. Narasimham | Sahitya Darsanamulu. |

URDU LITERATURE

1. Critical appreciation of two out of four passages of the following: Iqbal; Bang-e-Dira.
2. Critical Study of Abdul Haq; Chand Hamasar; Pitras Bhukhari; Mazameen-e-Pitras.
3. An Essay on a Literary Topic.
4. Ghaxal, Masnavi, Qasida, Rubae, Marisia, Dastan, Assana Novel, Inshaiya, Khaka, Haju and Tamseel.
5. Study of Literary Form: Short Story Prem Chand - Aakhri Tuhfa.

ANIMAL HUSBANDRY AND VETERINARY SCIENCE

1. VETERINARY PARASITOLOGY:

Parasitism - Epizootology Host specificity, Resistance and Pathogenicity - Broad classification of Helminths, Arthropods and Protozoa affecting Livestock - Diagnostic methods - Importance of Helminths, Arthropods and Protozoa in relation to health of Livestock. Control methods in General against Helminthiasis and Protozoan diseases of Farm animals and measures against insects of importance to livestock. General account of immuno-Prophylaxis and immuno diagnostic methods.

2. VETERINARY MICROIOLOGY:

Morphology - Cytology and structure of bacteria - Chemical composition of bacteria - Pigments - Physiology - Growth and metabolism of bacteria - Nutritional requirements of bacteria - Factors influencing the Growth of bacteria. Principles of Sterilization - Cultivation and pure culture techniques - Disinfection - Chemotherapy - Bacterial Genetics. Classification and nomenclature of bacteria - Study of morphology cultural characters, biochemical characters, pathogenesis, antigenic structure, immunity and diagnosis of diseases caused by spirochetes, campylobacter - Pseudomonas, Brucella - Pasteurella - Hemophilus - Actinobacillus - Moraxella - Entero-bacteriaceae family - Gram positive cocci - Bacillaceae family - Corynebacterium - Mycobacterium - Mycoplasma - Properties of Fungi - Fungal Diseases of animals - General characteristics of various important viral diseases occurring in Livestock. Viral vaccines, chemotherapy of viral infections.

3. VETERINARY MEDICINE:

Definition, etiology, incidence, mode of infection, symptoms, course, clinical pathology, diagnosis, differential diagnosis, prognosis, post-mortem findings and curative and preventive treatment of the diseases affecting different systems of various species of domestic animals.

Examination of animals for soundness, examination of injuries, post-mortem examination, collection and despatch of material for chemical analysis.

Epizootology, pathogenesis, diagnosis, methods of prevention and control of common Bacterial, Viral, Rickettsial, Fungal and Protozoan diseases - Metabolic and deficiency diseases.

4. VETERINARY PUBLIC HEALTH:

Lay out, construction, designing, organisation, maintenance and management of abattoirs - Elements of meat hygiene, ante mortem and post-mortem inspection - Sanitary standards for meat packing plants - Contamination, preservation and spoilage of meat, fish, egg and poultry foods - Public health aspects of milk production.

5. ANIMAL REPRODUCTION & GYNAECOLOGY:

Physiology of reproduction in male and female animals - Regulation of estrus cycle - Gestation - Care of new born animals - Infertility problems in male and female animals - Advantages and limitations of artificial insemination - Frozen semen - Embryo transfer in farm animals.

6. VETERINARY SURGERY:

Common surgical affections of various parts of bovines and their treatment and remedies.

7. ANIMAL GENETICS AND BREEDING:

Principles of Genetics as applied to Livestock and poultry - Mendelian principles, linkage and crossing over, sex linked and sex limited Characters - Principles of population genetics - Important breeds of cattle, buffaloes, sheep, goats and poultry. Breeding Methods and breeding policies adopted for Livestock improvement.

8. ANIMAL NUTRITION (INCLUDING FODDER PRODUCTION)

Importance of Nutrients in Animal health and production - Metabolism of dietary carbohydrates and proteins in ruminants and non-ruminants - Nutrients and metabolic significance of minerals and Vitamins - Formulation of rations for Livestock - Importance of Feed technology in relation to animal productivity - Agro-Industrial by-products, their feeding value and incorporation in meal Mixtures - Improving nutritive value of poor quality straws.

9. LIVESTOCK PRODUCTION AND MANAGEMENT:

General - Economic importance of different Livestock, their contribution to national resources Livestock population and distribution in India - Livestock marketing and insurance. Present status of dairy industry in agricultural economy in India - Milk breeds of cattle and Buffaloes - Dairy Farm planning - Economics of milk production, clean milk production - Operation flood programmes and its impact on dairying.

SOCIAL WORK

1. Concept, Scope and Nature of Social Work. Definition of the terms Social Welfare, Social Service, Social Reform and Social Action.

2. A historical review of social work in India and abroad. The philosophy of Social Work and its relationship to changing Indian Culture. Professional and ethical values of Social Work.

3. Methods of Social Work: Definition, Scope, Principles and values of case work, Group work and Community Organisation.

4. Fields of Social Work: Government and Voluntary efforts, difference between Government - Professional - Voluntary work in the various fields of Social Work practise such as:

Youth Welfare

Labour Welfare

Correctional Social Work

Medical and Psychiatric Social Work

Rural and Urban Community Development - Local Self Government

Panchayat Raj.

Family and Child Welfare:

Importance of Family and Child Welfare, Status, Problems of Women in India and Special Legislation relating to:

Marriage, dowry, inheritance and maintenance of women, problems of working women, women in need of special care.

State Women's Welfare Department: Organisation, functions and Programmes.

Family Welfare Planning: Trends in demography and its impact on the nation.

Demographic characteristics of child population, emerging philosophy of Child Welfare and emphasised in the Children's Charter of Rights, Indian Constitution and other legislative provision.

Importance of the Family in the development of the personality of the child, child rearing practices in India. Children in need of special care, the disabled, the deserted and disturbed in the role of professional help and services available.

Child Welfare in the Five Year Plans, Child Welfare Schemes by the State.

Philosophy and Objectives - Organisational structure and functions - a review.

Needs of Children and organising programmes to improve health, nutrition, recreational and educational needs. Problems and needs to handle them.

Role of Voluntary agencies and their contribution, Social Welfare Administration, Semi-Government agencies and Central Social Welfare Board, State Social Welfare Board - the structure and functions.

HOME SCIENCE

Food Science and Nutrition:

Basic food group which will provide nutrition, requirement for normal health; body building goods, energy food and protractive foods - Cereals - millets, legumes, oilseeds, milk and milk products, flesh goods, egg, fish, vegetables, fruits - Nutritive Value; selection, storage, processing and cooking methods their effect on nutritive value and palatability - evaluation of food quality - subjective methods of measuring quality of products - products - preparation of score cards.

Food poisoning, food allergy - Biological function, food sources and deficiency signs of carbohydrates, fat, proteins, vitamins and minerals - Nutritional inter-relationships.

Food and Nutrient requirement in human life cycle - Adulthood pregnancy - lactation - infancy - pre-school age, school age, preadolescence and adolescence - nutritionally vulnerable groups - factors effect in nutrient requirements.

Principles of meal planning - principle of diet in diseases. Therapeutic modification of normal diet during dietary deficiencies diseases - Anemia, PCM, Vit.A and other common diseases - Fever Diseases of gastric intestinal tract, obesity, Diabetes - Heart diseases and Renal diseases.

Assessment of nutritional status of communities and their interpretation-clinical Biochemical - Anthropometry - Biophysical and Diet surveys.

Child Development:

Factors affecting growth and development of child prenatal care preparation for child birth - premature baby - causes postnatal care breast feeding v.s. bottle feeding weaning - immunization, physical intellectual, and emotional development during infancy toddlerhood - childhood and adolescence developmental talks - physical and physiocological needs of young children - Learning types and effects importance of play - language growth - Habit of formation.

Creches and Balwadies - Importance of pre-school education needs and characteristics of pre-school child - Needs of Importance in the growth and development of children.

Population education, Child and family Welfare services of State National and International Agencies.

Agriculture productivity trends - Demand and supply of foods grain

- Agriculture planning and Government policy - Credit and credit institutions in the agricultural sector
- Agricultural marketing - Storages losses - Rural reconstruction - Community development and Panchayats - their principles and organisations.

Principles and methods of Extension work - Individual group and mass media. Audio visual aids in extension work. Programme planning - execution and evaluation in extension work. Developing leadership - organisation of woman in villages.

The Five Year Plan of Government of India - Principles of Rural reconstruction - Problems of Indian villages - Community development - National Programmes for rural women and children ANP, IRDP, SNP Adult literacy, ICDS - Family Welfare Programme - Social Welfare Boards etc.

Problems involved in improving nutritional status of Community, Nutrition intervention programmes - International agency involved in alleviating malnutrition - UNESCO, ENICEF, WHO, FAO.