

Page No. : 1
(nu Image Maker)

APPENDIX - III

Law	16	Animal Husbandary	17	Statistics	18
-----	----	-------------------	----	------------	----

Preparation of Final Accounts of Sole Proprietorships. **Partnership Accounting:** Problems relating to Admission, Retirement and death of a Partner, Dissolution of a firm including piecemeal distribution among partners. **Company Accounts:** Issue of shares and Debentures; Redemption and conversion of Debentures; Treatment of profits prior to Incorporation; Capitalisation of Profits and Issue of Bonus Shares. Statutory provisions regarding preparation of Final account of Companies. Accounting of Non-Trading Organisations—Partnership, Joint Stock Companies and Audit Programme. Working papers and Audits from the records. Analysis and Interpretation of Financial Statement, Methods—Cash flow statements, Statement of Sources and Uses of Funds and Statement of Charges in working capital. **Ratio Analysis:** Ratios relating to short term liquidity, long-term solvency and profitability. Ratios relating to measurement of overall performance of an enterprise. Valuation of Goodwill and shares. **Auditing:** Nature basic principles and objections. Techniques of Auditing: Examination of documents and vouchers, Physical Verification, Direct confirmation, Test checking, Analytical review and Audit Programme. Working papers and Audits from the records. Internal control, Internal Check and Internal Audit and their effects of Audit Programme Audit of Different business organisation. Audit of sole proprietary and partnership Firms, and Joint Stock companies. Management and cost Audits. **Emerging areas of Accounting:** Basic elements of Human Resource Accounting, Social Accounting and Value-Added Accounting.

Part - II

Business Organisation, Management And Secretarial Practice: Different forms of Business Organisations : Their main features. Sole proprietorship and Hindu Undivided family business. Partnerships-Characteristics, Registration, Partnership Deed; Rights, duties and liabilities of partners; Admission, Retirement and Death of a partner; Dissolution of a Partnership Firm. **Joint Stock Company:** Characteristics and Types, Formation and Incorporation of Companies; Types of Securities and methods of their issue. Doctrine of Indoor Management, Constructive Notice and Ultra Vires. Cooperatives, Public Enterprises-their forms of organisation. **Bonuses and Combinations :** Types and importance. Monopolies and Restrictive Trade Practices. Modernisation and Rationalisation of business and Industrial organisation. Social Responsibility of business in a liberalised economy. **Foreign Trade:** Import and Export Trade. Procedure and Financing of Import & Export trade. Export-Promotion, Techniques and Incentives, Exim Bank. **Insurance :** Principles and Practices of Life, Fire, Marine and General Insurance. Insurance business in global scenario. **Management :** Concept, Scope and Functions and strategies. **Organising:** Organizational Structure, Formal and Informal Organisation. Levels of Authority. Line and Staff Positions. Centralisation, Decentralisation and Delegation of Authority. Staff-selection, Placement and Training, Wage and Salary Administration. Job specification and Job Evaluation. **Directing :** Principles and strategies. **Leadership:** Communication and Motivation. **Coordination:** Concept and methods. **Control:** Principles and Practices; Selling Performance standards & evaluation, corrective actions. Span of Control, Management by Objectives, Management by Exception, Management of change and crisis management. **Office Management :** Principles and scope, systems and Routines, Handling and Maintenance of Office Records, Modern aids to office Management-Office equipments and machines, Automation and computerisation, Rationalisation of office service. **Company Secretary:** Qualifications, appointment, role and functions; Rights, Duties and Liabilities of a company secretary ; Drafting of Agenda and Minutes.

4. CHEMISTRY

1. Inorganic Chemistry: (A) (i) Atomic Structure: Elementary particles, Bohr's and Sommerfeld models of the atom, Wave-particle duality De-Broglie equation, Heisenberg uncertainty principle, elementary ideas of Schrödinger wave equation, atomic number, electronic configuration of elements, Pauli's exclusion principle, Hund's rule of maximum spin multiplicity, aufbau principle, Long form of periodic classification of elements. (ii) **Nuclear Chemistry :** Natural and artificial radioactivity, half-life period, nuclear reactions, fission and fusion reactions uses of radioactive isotopes. (b) **Periodic Properties of the Elements:** Atomic, covalent, Vander Waal's and ionic radii, ionization potential, electronegativity and electroaffinity. (c) **Saint features of s,p,d and f-block elements. (d) Chemical Bonding:** Ionic, covalent (polar and non-polar), coordinate bonds, s-and p-Hydrogen bonding, concept of hybridization of atomic orbitals(sp,sp², sp³, sp³d, sp³d² and sp³d²). Prediction of shapes of simple inorganic molecules on the basis of VSEPR theory. Elementary ideas of molecular orbital theory-(E) **General principles of extraction and purification of metals. F-Structure and Bonding:** General nature, chloro and anhydrous aluminium chloride, nickel carbonyl and Xenon compounds, **G-Redox Reactions:** Oxidation states, oxidation number, equivalent weights of oxidising and reducing agents, balancing of redox reactions. **H-Coordination Chemistry:** Double salts and coordination compounds, Werner's theory, Effective atomic number (EAN), Electronic configuration of complexes, IUPAC system of nomenclature.

1. Environment Pollution : Pollutants and their influence on environment. **2. Organic Chemistry: A. Bonding in Carbon Compounds:** s, sp² & sp³ hybridization, s and p-orbital overlap, electronic effects, hyperconjugation, resonance, **B. Reaction Mechanism:** Homolytic and ionic cleavage of bonds (free radicals, carbocation ion and carbon ion) Addition and substitution reactions (E1, E2, SN1 and SN2, reactions) **C. Hydrocarbons :** Studies of alkanes, alkenes, and alkynes **D. Preparation and Properties of the following Aliphatic Compounds:** Halides, alcohols, ethers, aldehydes, ketones, acids, esters, amines, amides and hydroxyacids (lactic, citric, maleic and furoic acids) **E. Carbohydrates:** Classification and general reactions, **F. Organic Chemical Compounds:** Grignard reagents and their synthetic applications. **G. Stereochemistry:** Optical and geometrical isomerism, concept of conformation, Environmental pollution and control, plants as indicator of pollution. **H. Benzene and its Simple Derivatives:** Benzene, toluene, xylene, phenol, aldehydes, nitro and amino compounds. Benzoic, salicylic, cumic, mandelic and sulphonic acids. Aromatic halides and ketones. Diazo and hydrazo compounds. Naphthalene, pyridine and quinoline. **I. Elementary Idea of the chemistry of oils, fats, proteins, vitamins and their roles in nutrition and industry J. Basic principles involving spectral techniques (UV, visible, i.r.). 3. Physical Chemistry : A. Gaseous State :** Kinetic theory of gases and gas laws, Maxwell's law of distribution of velocities, vander Waals equation. Critical behaviour of gases, law of corresponding states, heat capacities of gases. **B. Physical Properties and Molecular Constitution:** Molar volume, parachor, molar refraction, molar polarization and dipole moment. **C. Liquid state:** Properties of liquids, viscosity, surface tension and vapour pressure. **D. Solutions :** Raoult's law, lowering of vapour pressure, depression of boiling point, elevation of boiling point, osmotic pressure, Determination of molecular weight of solutes, Association and dissociation of solutes. **E. Thermodynamics:** The first law of thermodynamics, isothermal and adiabatic expansions, Joule-Thomson effect, enthalpy, heat capacities. Enthalpies of reaction formation, combustion and solution. Bond energies, Kirchhoff's equation, second law of thermodynamics, entropy, free energy. Criteria of spontaneity and chemical equilibrium. **F. Chemical Equilibria:** Law of mass action and its application to homogeneous and heterogeneous, Le-chatelier principle and its application to chemical equilibria. **G. Chemical Kinetics:** Molecularity and order of reaction, First order and second order reactions, Determination of order of a reaction. Effect of temperature of reaction rate, energy of activation. Collision theory of reaction rates, theory of activated complex. **H. Electrochemistry :** Faraday's law of electrolysis, conductivity of an electrolyte, equivalent conductivity and its variation with dilution. Transport number, solubility of sparingly soluble salts. **I. Ionic Equilibria:** Electrolytic dissociation, ionic product of water, Ostwald dilution law, theory of strong electrolytes, solubility product Acids & Bases (Bronsted concept and Lewis concept), acids and bases, hydrolysis of salts, hydrogen ion concentration, pH, buffer solutions, theory of indicators. **J. Reversible Cells :** Standards hydrogen and calomel electrodes. Electrodes and redox potentials. Concentration Cells. **K. Phase Rule:** Explanation of terms involved, Application to one and two component systems. Distribution law. **L. Colloids:** General nature of colloidal solutions, their classification, methods of preparation and properties of colloids. Coagulation, protective action and gold number. Adsorption, physisorption and chemisorption, Freundlich and Langmuir isotherms. **M. Catalysis:** Homogeneous and heterogeneous catalysis. Catalytic promoters and poisoning. **N. Problems :** Simple numerical and conceptual problems based on the full syllabus.

5. PHYSICS

1. Mechanics: Units and dimensions S.I Units, Newton's laws of motion, Conservation of linear and angular momentum, projectiles, Rotational motion, Moment of inertia, Newton's law of gravitation. Gravitational field and potential, planetary motion, Kepler's laws, Artificial satellite, Fluid motion, Bernoulli's theorem and its applications. Surface tension, Excess pressure. Viscosity, Stoke's Law, Elastic constants and their interrelation. Bending of beam, Torsion of cylindrical bodies, Elementary idea of special theory of relativity and simple applications. Michelson Morley experiment. Lorentz transformation. Mass-energy relation and its equivalence. **2. Thermodynamics:** General nature of thermodynamics, First and second laws, Heat engines, Entropy, Thermodynamical potential, Maxwell's relations. Kinetic theory of gases, Ideal gas equation, Brownian motion, Maxwell's velocity distribution, Equipartition of energy, mean free path, Transport phenomena, vanderwaals equations of state, Critical constants, Black body radiation, Wien's and Rayleigh Jeans law, Stefan-Boltzmann law, Planck's law. Specific heat of solids, Heat conduction in solids. **3. Waves and Oscillation:** Simple harmonic motion Wave motion Travelling wave, superposition of waves, standing waves, Beats, Composites, Cyclotron Betatron, Mass spectrometers, Dia-para and ferro-magnetism. **6. Modern Physics :** Measurement of electronic charge and specific charge e/m, Measurement of Planck's Constant, Rutherford atomic model; Bohr's theory of hydrogen atom, Optical and X-ray spectra, Bragg's law, Moseley's law, Photo-electric and Compton effects. Wave nature of matter, wave particle duality, De-Broglie's wave, uncertainty principle, Natural and artificial radio activity: α , β and γ -emissions chain decay. Elementary-Ideas of nuclear structure, Nuclear fission and fusion, elementary particles and their classification. **7. Electronics :** Elements of semi-conductor physics. Intrinsic and extrinsic semi-conductors, resistivity and its temperature variation, P-N junction and its applications. P-N-P and N-P-N-transport and their applications. Logic gates.

6. MATHEMATICS

1. Algebra: Sets and equivalence relations, Real and complex numbers, polynomials. Integral, rational, real and complex roots of a polynomial equation, relation between roots and coefficients, repeated roots, elementary symmetric-functions. Elementary theory of groups (excluding cyclic and permutation groups). **2. Matrices :** Addition and multiplications, elementary row and column operations, inverse of a matrix, rank of a matrix, solutions of systems of linear equations. Determinants. **3. Calculus :** (a) Functionality of a single variable, Limits, Continuity, properties of continuous function in a closed interval, differentiability. Mean value theorems, Taylor's theorem, Maxima and Minima, application to curves, tangent, normal properties, Curvature, asymptotes, double points, points of inflexion. Partial differentiation and its application (b) Definition of definite integral of a continuous function as the limit of a sum, fundamental theorem of calculus, methods of integration, α -integration, quadrature, Volume and surfaces of solids of revolution, Double and Triple integration. Application to area, volume centre of mass, and moment of inertia. (c) Summation of series. Tests of convergence of infinite series of positive terms. **4. Differential Equations :** First order differential equations. Singular solutions, Geometric interpretations. Linear differential equations with constant coefficients. **5. Geometry :** Two dimensional analytical geometry of straight lines and conics referred to cartesian and polar axes, Circle, ellipse, parabola, hyperbola, straight lines, spirals, and conics. **6. Mechanics :** Vector algebra, dot and cross products of two and three vectors, moment of a force, equilibrium of coplanar forces. Common Catenary. Motion of a particle in a straight line, Simple harmonic motion, projectiles and central forces.

7. INDIAN HISTORY: SECTION-A

1. Prehistoric culture in India. 2. Indus Civilization, Origins. The Nature Phase : extent society, economy and culture. Contacts with other cultures. Problems of decline. 3. Geographical distribution and characteristics of pastoral and farming communities prior to the Vedic period. 4. Vedic Period : Vedic society, Vedic society. The Vedic texts; change from rigid to later Vedic phases. Religion : Upanishadic thought. Political and Social organisation; evolution of monarchy and varna system. 5. State formation and urbanization, from the mahajanapadas to the Nandas. Jainism and Buddhism, Factors for the spread for Buddhism. 6. The Mauryan Empire, Chandragupta; Megasthenes. Ashoka and his inscriptions, his dharma, administration, culture and art. The Arthashastra. 7. Post-Mauryan India, BC200-AD- 300. Society : Evolution of Jatis. The

Salavahanas and state formation in Peninsula. Sangam texts and society Indo-Greeks. Sakas, Parthians, Kushanas, 750-1200. Religion : Shaivism, Bhagavatism, Jainism, Buddhism, temples and monastic institutions : Sankaracharya, Islam; Sufism. Literature and Science. Alberuni's 'India'. Art and architecture. 11-12. Thirteenth and fourteenth centuries : Ghorian invasions causes and consequences. Delhi Sultanate under the 'Slave' Rulers Alauddin Khilji; Conquests; administrative : agrarian and economic measure. Muhammad Tughluq's innovations. Firuz Tughluq and the decline of the Delhi Sultanate. Growth of commerce and urbanization, Mystic Sufism, Hindu mysticism and religious revival. Technological changes. 13. The fifteenth and early 16th century : major Provincial dynasties: Vijayanagara Empire. The Lodis. First phase of the Mughal Empire: Babur, Humayun. The sur empire and administration. The Portuguese.

SECTION-B

Montheistic movement : Kabir, Guru Nanak and Sikhism, Bhakti, Growth of regional literature, Art and culture. 14-15. The Mughal Empire, 1556-1707. Akbar, conquests, administrative measure, Jagir and Mansab systems, policy of Sulh-i-Kul, Jahangir, Shahjahan and Aurangzeb; expansion in the Deccan religious policies. Shivaji, Culture : Persian and regional literatures, Religious thought : Abul Fazl; Maharashtra dharma. Painting Architecture. Economy: conditions of peasants and artisans, growth in trade; commerce with Europe. Social stratification and status of women. 16. Decline of Mughal Empire, 1707-61, Causes behind decline, Maratha power under the Peshwas. Regional states. The Afghans Major elements of composite culture. Sawai Jai Singh, astronomer. Rise of Urdu language.

SECTION-C

17. British expansion: The Carnatic Wars, Conquest of Bengal, Mysore and its resistance to British expansion. The three Anglo Maratha Wars. Early structure of British Raj. Regulating Pitt's India Acts. 18. Economic impact of the British Raj. Drain of Wealth (Tribute) : land revenue settlements (Zamindari, ryotwari, mahawari); Deindustrialisation; Railways and commercialisation of agriculture; growth of landless labour. 19. Cultural encounter and social change: introduction of western education and modern ideas: Indian Renaissance, social and religious reform movements; growth in Indian middle class. The press and its impact; rise of modern literature in Indian languages. Social reforms measures before 1857. 20. Resistance to British rule. Early uprisings; the 1857 Revolt, causes, nature, course and consequences. 21. Indian Freedom struggle- The first phase: Growth of national consciousness; Formation of Association : Establishment of the Indian National Congress and its Moderate phase, Economic Nationalism; Swadeshi Movement; the growth of extremism and the 1907 split in Congress; The Act of 1909 the policy of Divide and Rule Congress-League pact of 1916. 22. Gandhi and his thought : Gandhian techniques of mass mobilisation, Khilafat and Non-Cooperation Movement, Civil Disobedience and Quit India movement. Other strands in the National Movement - Revolutionaries, The left, Subhas Chandra Bose and the Indian National Army. 23. Separatist Trends in Indian nationalist politics- the Muslim League and the Hindu Mahasabha; the Post 1945 developments; Partition and independence. 24. India Independent to 1964. A Parliamentary, secular, democratic republic (the 1950 Constitution), Jawaharlal Nehru's vision of a developed, socialist society, Planning and state-controlled industrialization, Agrarian reforms, Foreign policy of Non-alignment. Border conflict with China, and Chinese aggression.

8. GEOGRAPHY

Section-A General Principles : i. Physical Geography, ii. Human Geography. iii. Economic Geography. iv. Evolution of Geographic Thought, v. Environment, Ecology and Conservation, vi. Cartography (Scales, Map Projection, Toposheets, Weather maps, Thematic maps and diagrams). **Section-B: World Geography :** i. Major Landforms, Climates, Soils and Vegetation zones. ii. Major Natural Regions. iii. Population : Distribution and growth, Races and Tribes. iv. Agriculture (Major crops and agriculture regions); Forestry and Fishing v. Minerals Energy and water resources; problems and prospects. vi. Industries (Textiles, Iron & Steel, petrochemicals, Automobiles and Ship building. vii. Trade and Transport: viii. Regional Geography of Developing World with special reference to South Asia S.W. Asia, East Asia, Africa (Guinea Coast South Africa, East Africa and Nile Basin); Argentina, Andean Countries and Brazil. **Section-C: Geography of India :** i. Structure, Relief, Drainage, Climate, Soils and vegetation. ii. Agriculture, Forestry and fishing; problems and prospects. iii. Minerals, Energy and Water Resources. Utilization and Conservation. iv. Industries and industrial development. v. Population and Settlements. vi. Transport and Trade.

9. ECONOMICS

PART-I

1. Micro Economics : Utility analysis and Law of Demand, Elasticity and Demand, Indifference curve analysis, Consumer's Equilibrium, Production function and the law of return, Cost and revenue function, supply functions, Equilibrium of the firm under different market situation. Pricing of factors of production, Concept of Economic welfare. Pareto Optimality. 2. **Macro Economics:** Various concepts of National Income, Method of calculation, National Income Accounting, National Income and its uses, Classical and Keynesian theories of employment 3. **Money and Banking:** Concept and functions of money, Measurement of value of money supply (M1, M2 and M3) Commercial Banking, functions of Central Banks. Determination and measurement of value of money, price indices inflation its causes and effects. 4. **Public Finance:** Sources of Public revenue, Types of Taxes, Classification and principles of Public expenditure, Public Debt Budget and types of budget deficits. 5. **International Economics :** Theory of comparative cost and Heckscher-Ohlin theory, Free trade and protection, Balance of payments and adjustment-mechanism. Foreign exchange rate determination, I.M.F., I.B.R.D., and W.T.O.

PART-II

6. Economic Growth and Development : Meaning and measurement of Growth and development, Harrod and Domah growth models. Sources of growth : population, productivity, human resources development technology and capital, Approaches to development : Big push theory, critical minimum point, Balanced and unbalanced growth. Measures of economic inequality, international comparison of development.

PART-III

7. Indian Economy: Trends in population growth and salient result of 1991 population census. structure and trends of National income, savings and investment in India. Dimensions of Unemployment problems, Causes and remedies, extent and measurement of poverty Economic planning in India. Strategies, goals, and achievements, Agricultural and Industrial Policy, Liberalisation and globalisation in Indian economy, Fiscal changes in fiscal, monetary and trade policies and their effects. Development of Infrastructure, problems and prospects.

10. POLITICAL SCIENCE: Section-A: Theory

1. (a) State: Theories of Sovereignty- Monistic, Pluralistic. (b) Theories of the Origin of State- Social Contract, Evolutionary and Marxian. (c) Theories of Function of State- Liberal Social and Welfare. 2. (a) Concepts- Rights, Liberty, Equality and Justice (b) Political theories, Liberalism, Marxism and Gandhism. (c) Theories of Representation, Public Opinion. Pressure Groups and Political parties.

Section - B: Government

1. Constitution and Constitutional Government : Unitary and Federal Governments ; Parliamentary & Presidential Govt. 2. **INDIA : (a) National Liberation Movements and Constitutional Development. (b) The Indian Constitution :** Basic Features, Fundamental Rights, Directive Principle of State Policy, Legislature, Executive, Judiciary and Administrative Policy. **(c) Union State Relations and Panchayati Raj (d) Indian Federalism and its comparison with the U.S. Federalism.**

11. SOCIOLOGY

UNIT-I- Basic Concepts : Social Group- types : Primary, Secondary and Reference Community, Association, Institution. **Society and its types :** Tribal, Agrarian, Industrial and -Post Industrial, Social Structure and Social System Factors and Culture.

UNIT-II- Social Disorganisation, Conformity And Deviance : Concept, Symptoms and causes of disorganisation, anomie crime, juvenile delinquency, drug addiction, alcoholism, AIDS, casteism, regionalism and communalism.

UNIT-III- Social Stratification : Concept; forms : caste, class and estate. Social stratification and social hierarchy. Status-Ascribed and achieved; role- role set and role conflict. Social mobility-horizontal and vertical.

UNIT-IV- Social Change And Social Control : Concept of Social change, linear and cyclical change factors of social change : Demographic, economic technological and cultural. Planning and social change. Social control- Concept, means and agencies.

UNIT-V- Social Disorganisation, Conformity And Deviance : Concept, Symptoms and causes of disorganisation, anomie crime, juvenile delinquency, drug addiction, alcoholism, AIDS, casteism, regionalism and communalism.

UNIT-VII- Economic, Polity And Society : Economic systems of simple and complex societies; liberal and controlled economy, political system of India, pressure group, caste and politics.

UNIT - VIII- Under Privileged Sections of Society: Constitutional provisions regarding the scheduled caste/ scheduled tribes/ and other backward classes

12. PHILOSOPHY

Section-A: Problem of philosophy: 1. Substance: Descartes, Spinoza Leibnitz, Locke, Criticisms by Berkeley and Hume; Nyaya-Vaisesika, Jainism, Criticism by Buddhism 2. **God, Soul and the world :** Aristotle, St. Aquinas, Descartes, Spinoza, Nyaya-Vaisesika Samkara and Ramanuja. 3. **Universals:** Realism and Nominalism (Plato, Aristotle-Berkeley, Nyaya-Vaisesika, Buddhism). 4. **Prama, Pramans and Pramanyavada:** Advaita, Nyaya-Vaisesika, Buddhism and purva Mimamsa. 5. **Truth and Error:** Correspondence theory, Coherence theory, Pragmatic theory, Khyativada Anyathakhyati, Akhyati, Satkhyati and Anivacanayakhyati

6. Matter and Mind: Descartes, Spinoza, Leibnitz Berkeley.

SECTION-B- ETHICS : 1. **Fact and value. 2. Right and Good:** Teleology and Deontology. 3. **Psychological Hedonism. 4. Utilitarianism:** Bentham, Mill, Sidgwick. 5. **Kant's Ethics. 6. Problem of Freedom of will. 7. Meaning of Moral Judgements:** Descriptivism, Emotivism, descriptivism 8. **Ethics of the Gita;** Niskamakarma, Uvarthma, Shitprajna 9. **Jaina Ethics. 10. Buddhist Ethics:** Eightfold path, ideas of Arhat and Bodhisattva. 11. **Gandhian Ethics :** Truth, Non-violence, End and Means.

SECTION-C- LOGIC : 1. **Truth and Validity. 2. Classification of propositions :** Traditional and Modern. 3. **Syllogism:** Figures and Moods, Rules of Syllogism (General and Special) 4. **Fallacies:** Formal and informal. 5. **Prepositional Calculus :** Symbolisation, Truth- Functions and their interdefinability, Truth-Table, Formal Proof.

13. GEOLOGY: PART-1

(a) Physical Geology : Solar System and the Earth Origin, age and internal constitution of Earth. Basic concepts of geosynclines and isostasy. Plate tectonics- mountain building, seafloor spreading and Continental drift. Weathering, erosion, transportation and deposition by natural agencies. Earthquakes-distribution, causes and effects. Volcanoes-types, causes, distribution and products. **(b) Geomorphology :** Basic concepts of Geomorphology cycle of erosion. Drainage patterns and landforms formed by river, glacier, wind and sea. **(c) structural Geology :** Primary and secondary structures- Lineation, foliation, folds, faults unconformities and joints; their description, classification and recognition. Mechanics of folding and faulting. Effects of folds and fault of outcrops. Nappes and geological windows. **(d) Field Geology :** Topographic and geological maps. Representation of altitude, slope, strike and dip in topographic and geological maps. Clinometer Compass and its use. Criteria determination of order of superposition of beds.

Continued...

Size : 25 cm x 38 cm = 950 Sq. cm.

Page No. : 3

(Anu Image Maker)

SECTION- B
Enzymes and plant pigments, Photosynthesis-modern concepts and factors effecting the process, aerobic and anaerobic respiration, Growth and development. Photoperiodisms and vernalization. Plant growth regulators and their mechanism of action & importance in crop production.

PAPER-II

General Organic Chemistry : Electronic displacement inductive, electromeric and mesomeric effects, Conjugation and hyperconjugation, Resonance and its application to organic compounds, Electrophiles, nucleophiles, carbocations, carbanions and free radical. Organic acids and bases. Effects of structure on the strength of organic acids and bases; hydrogen bond and its influence on properties of organic compounds.

Concepts: Mechanism of **Organic Reaction Mechanisms :** Mechanism of addition, substitution, elimination, reactions and rearrangements, Mechanism of Electrophilic and nucleophilic automatic substitution. Mechanism of the following reactions : Aldol condensation, Claisen condensation Beckmann rearrangement, Perkin reaction, Reinert-Tiemann reaction, Cannizzaro's reaction, Friezel-Craft's reaction, Reformatsky's reaction and Wagner-Meerwein rearrangement.

Aromatic Compounds : Chemistry of simple aromatic compounds belonging to following classes: Benzene, substituted benzene, the mechanism of electrophilic reaction involving the arenes, alkanes, alkynes, alkyl halides, alcohol, ethers, thioledehydes, esters, unsaturated carbonyl compounds, acid chlorides, amides, nitriles, derivatives, amines, aminoacids, hydroxy acids, unsaturated acids and diabolic acids. Synthetic uses of benzene ring.

Continued

malonic easier acetoacetic easier. Grignard's reagent, carbene, diazomethane and phosphoranes. **Carbohydrates**: Classification, configuration and general reaction of simple monosaccharides. Ozonolysis, mutarotation, pyranose and furanose structures. Chain lengthening and chain shortening in aldoses and ketoses. Interconversion of glucose and fructose. **Stereochemistry and conformations**: Elements of symmetry, optical and geometrical isomerism in simple organic compounds. Absolute configuration (R & S); configurations of geometrical isomers, E & Z notations, Conformation of mono and distributed cyclohexanes. Boat and chair forms. **Aromatic Compounds**: Modern structure of benzene; Concept of aromaticity. Huckel rule and its simple application to non-benzenoid aromatic compounds. Activating and deactivating effect of substituent groups, directive influence. Study of the compounds containing following groups attached to the alkyl and benzene ring halogens, hydroxy, nitro and amino groups. Sulphonic acids, benzaldehyde, salicyldehyde, acetophenone, Benzoic, salicylic, phthalic, cinnamic and mandelic acids. **Naphthalene & Pyridine**: Synthesis, structure and important reactions. **Alkaloids**: General methods of structure elucidation of alkaloids, chemistry of nicotine. **Organic Polymers**: Mechanism of polymerization, polymers of industrial importance, synthetic fibers, **Chemistry of Living Cells**: A Brief introduction to chemical ecology. **Enzymes and Coenzymes**: Nomenclature and characteristics, factors which affect enzyme activity. **NMR Spectroscopy**: Principle of PMR, chemical shift, spin-spin coupling, interpretation of PMR spectra of simple organic molecules. **Evaluation of analytical Data**: Errors, accuracy and precision. Relative and standard deviation rejection of doubtful, observations, t-test, Q-test. **Solvent Extraction**: Distribution law, Craig's concept of counter-current distribution, important solvent extraction systems. **Chromatography**: Classification of Chromatographic techniques, general principles of absorption, partition exchange, paper and thin layer chromatography. **Environmental Chemistry**: Air pollutants and their toxic effects, depletion of ozone layer effects of oxides of nitrogen, fluorocarbons and their effect on ozone layer, Greenhouse effect, Acid rain.

4. PHYSICS: PAPER - I: Mechanics, Thermal Physics and Waves & Oscillations
1. Mechanics: Conservation law, collisions, impact parameter, scattering cross-section centre of mass and lab systems with transformation of physical quantities, Rutherford Scattering, Motion of a rocket under constant force field, Rotating frames of reference, Coriolis force, Motion of rigid bodies, Dynamics of rotating bodies, Moment of inertia, Theorems of parallel and perpendicular axes, Moment of inertia of sphere, cylinder, disc, Angular momentum, torque and precession of a top, Gyroscopic, Central forces, Motion under inverse square law, Kepler's Laws, Motion of Satellites (including geostationary), Galilean Relativity, Special Theory of Relativity, Michelson-Morley Experiment, Lorentz Transformations-addition theorem of velocities. Variation of mass with velocity. Mass-Energy equivalence. Fluid dynamics, streamlines, Reynold number Viscosity, Poiseuille's formula for the flow of liquid through narrow tubes, turbulence, Bernoulli's equation with simple applications.
2. Thermal Physics: Laws of thermodynamics, Entropy, Carnot's cycle, Isothermal and Adiabatic changes, thermodynamic Potentials, Helmholtz and Gibbs functions, Maxwell's relations. The Clausius-Clapeyron equation, reversible cell, Joule-Kelvin effect, Stefan Boltzmann Law, Kinetic Theory of Gases, Maxwell's Distribution Law of velocities, Equipartition of energy, specific heats of gases, mean free path, Bornstein Model, Black Body radiation specific heat of solids, Einstein and Debye theories. Wein's Law, Planck's Law, solar constant, Shah's theory of thermal ionization and Stellar spectra Production of low temperatures using adiabatic demagnetization and dilution refrigeration, Concept of negative temperature. **3. Waves of Oscillations**: Oscillations, simple harmonic motion, Examples of simple harmonic motion mass, spring and LC circuits. Stationary and travelling waves, Damped harmonic motion, forced oscillation and Resonance, Sharpness of resonance, Wave equation, Harmonic solutions, Plane and Spherical waves, Superposition of waves. Two perpendicular simple harmonic motions. Lissajous figures, Fourier analysis of periodic waves-square and triangular waves. Phase and Group velocities, Beats, Huygen's principle, Division of amplitude and wave front, Fresnel Biprism, Newton's rings, Michelson interferometer, Fabry-Potrot inter ferometer. Diffraction-Fresnel and Fraunhofer Diffraction as a Fourier Transform and Fraunhofer diffraction by rectangular and circular apertures. Diffraction by straight edge, Single and multiple slits. Resolving power of grating and optical instruments. Rayleigh criterion. Polarization, production and Detection of polarised light (Linear, circular and elliptical) Brewster's law, Huyghen's theory of double refraction, optical rotation, polarimeters. Laser sources (Helium-Neon, Ruby and semi conductor diode). Concept of spatial and temporal coherence Holography, theory and application.

PAPER - II: Electricity and Magnetism, Modern Physics and Electronics
1. Electricity and Magnetism: Coulomb's law, Electric Field Gauss's Law, Electric Potential, Poisson and Laplace equations for homogeneous electric, uncharged conducting sphere in a uniform field, point charge and infinite conducting plane. Current electricity, Kirchhoff's laws and its applications; Wheatstone bridge, Kelvin's double bridge, Carey foster's bridge, Bio-Savart law and applications. Ampere's circuital law and its applications, Magnetic induction and field strength, Magnetic shell Magnetic field on the axis of circular coil Helmholtz coil, Electromagnetic induction, Faraday's and Lenz's law, self and mutual inductances. Alternating currents L.C.R. circuit, series and parallel resonance circuits, quality factor, Maxwell's equations, electromagnetic waves. Transverse nature of electromagnetic waves, Poynting vector Magnetic fields in Matter. Dia, para, Ferro, Antiferro and Ferrimagnetism (Qualitative approach only). Hysteresis.
2. Modern Physics: Bohr's theory of hydrogen atom Electron spin, Optical and X-ray Spectral Stern-Gerlach experiment and spatial quantization, Vector model of the atom spectral terms, fine structure of spectral lines. J-J and L-S coupling Zeeman effect, Pauli's exclusion principle, spectral terms of two equivalent and non-equivalent electrons. Gross and fine structure, Raman effect, Photoelectric effect, Compton effect, De Broglie waves, Wave Particle duality, uncertainty principle, postulates of quantum mechanics. Schrodinger wave equation with application (i) particle in a box, (ii) motion across a step potential, One dimensional harmonic oscillator eigen values and eigen functions. Radioactivity, Alpha, Beta and gamma radiations. Elementary theory of the alpha decay. Nuclear binding energy. Mass spectroscopy, semi empirical mass formula. Nuclear fission and fusion. Elementary Reactor Physics, Elementary particles and their classification, strong and weak Electromagnetic interactions. Particle accelerators, cyclotron. Linear accelerators. Elements of the theory of solids, conductors, semiconductors, insulators and semiconductors. Intrinsic and extrinsic semiconductors, P-N junction, Thermistor Zener diodes. Reverse and forward biased P-N Junction, solar cell. Use of diodes and transistors for rectification, amplification oscillation, modulation and detection r.f. waves. Transistor, receiver, Television, Logic Gates and their truth table, some applications.

5. MATHEMATICS: PAPER-I
Linear Algebra: Vector space, bases, dimensions of a finitely generated space, linear transformation: Rank and nullity of a linear transformation, Cayley-Hamilton theorem, Eigenvalues and Eigen vectors, Matrix of linear transformation, Row and column reduction, Echelon form, Equivalence, Congruence and similarity. Reduction to canonical form, Orthogonal, symmetrical, skew-symmetrical, unitary, Hermitian and skew-Hermitian matrices their eigen values, orthogonal and unitary reduction of quadratic and Hermitian form. Positive definite quadratic form. Simultaneous reduction. **Calculus**: Real numbers, limits, continuity, differentiability. Mean value theorems, Taylor's indeterminate forms, Maxima and minima. Curve Tracing Asymptotes. Functions of several variables, partial derivatives, maxima and minima, Jacobian Definite and indefinite integrals. Double and triple integrals (techniques only), application to Beta and Gamma Functions, Areas, Volumes, Centre of gravity. **Analitical Geometry of two and three dimensions**: First and second degree equations in two dimensions in cartesian and polar coordinates. Plane, sphere, paraboloid, Ellipsoid, hyperboloid of one and two sheets and their elementary properties. Curves in space. Curvature and torsion. Frenet's formulæ. **Differential Equations**: Order and Degree of a differential equation, differential equation of first order and first degree, variables separable. Homogeneous, linear, and exact differential equations, differential equation with constant coefficients, application to Beta and Gamma Functions, Areas, Volumes, Centre of gravity. **Vector Analysis**: Vector Algebra. Differentiation of vector function of a scalar variable Gradient, divergence and curl in cartesian, cylindrical and spherical coordinates and their physical interpretation, Higher order derivatives, vector identities and vector, equations, Gauss and Stokes Theorems. **Tensor Analysis**: Definition of Tensor, Transformation of coordinates, contravariant and contravariant tensors. Addition and multiplication of tensors, contraction of tensors. Inner product, fundamental tensors, Christoffel symbols, contravariant differentiation, Gradient, curl and divergence in tensor notation. **Statics**: 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. **Dynamics**: Degree of freedom and constraints. Rectilinear motion Simple harmonic motion in a plane. Projectiles, Constrained motion, work and energy. Motion under impulsive forces, Kepler's laws. Orbits under central forces. Motion of varying mass. Motion under resisting medium. **Hydrostatics**: Pressure of heavy fluids. Equilibrium of fluids under given system of forces. Centre of pressure. Thrust on curved surfaces. Equilibrium of floating bodies, stability of equilibrium and pressure and gases.

PAPER - II
Algebra: Groups, subgroups, normal subgroup, homomorphism of groups, quotient groups Basic isomorphism theorems, sylow theorems. Permutation Groups, Cayley's Theorem, Rings and ideals. Principal ideal domains, unique factorization domains and Euclidean domains, Field Extensions, Finite fields. **Real Analysis**: Metric spaces, their topology with special reference to R' sequence in metric space Cauchy sequence completeness. Completion, continuous functions. Uniform continuity. Properties of continuous function of Compact sets, Riemann Stieltjes Integral, Improper Integral and their condition's of existence. Differentiation of function of several variables. Implicit function theorem, maxima and minima. Absolute and conditional Convergence of series of real Complex terms, Rearrangement of series, Uniform convergence, infinite products. Continuity, differentiability and integrability of series, Multiple integrals. **Complex Analysis**: Analytic functions, Cauchy's theorem, Cauchy's integral formula, power series, Taylor's series, Singularities, Cauchy's Residue theorem and Contour integration. **Partial Differential Equations**: Formation of partial differential equation. Types of integrals of partial differential equations of first order, Charpit's method. Partial differential equation with constant coefficients. **Mechanics**: Generalised constraints, holonomic and non-holonomic systems, D'Alembert's Principle and Lagrange's equations, Moment of inertia. Motion of rigid bodies in two dimensions. **Hydrodynamics**: Equation of continuity, momentum and energy, inviscid flow theory. Two dimensional motion, streaming motion sources and Sinks. **Numerical Analysis**: Transcendental and polynomial Equations-Methods of tabulation, bisection, regula-falsi secants and Newton-Raphson order of its convergence. Interpolation and Numerical differentiation formulae with error terms. **Numerical Integration of Ordinary differential Equations**: Euler's method, multisection, Predictor-Corrector methods. Adam's and Milne's method convergence and stability, Runge Kutta Method. **Operational Research**: Mathematical Programming, Definition and some elementary properties of convex sets, simplex methods, rectangular games and their solution.

6. GEOGRAPHY: PAPER - I: SECTION - A-PHYSICAL GEOGRAPHY
1. Geomorphology: Origin and structure of the earth, Earth movements Plate tectonics and Mountain Building: Isostasy; Vulcanism; Weathering and Erosion; Cycle of Erosion, Evolution of landforms; fluvial, glacial, aeolian, marine and continental landforms. Land form features. **2. Climatology**: Composition and structure of atmosphere, Insolation and Heat Budget, Atmospheric pressure and winds, Moisture and Precipitation; Airmasses and Fronts; Cyclone; Origin; Movements and associated weather, Classification of world climates; Köppen and Thornthwaite. **3. Oceanography**: Configuration of Ocean floor, Salinity Ocean Currents, Tides; Ocean deposits and coral reefs. **4. Soil and Vegetation**: Soils -genesis; classification and world distribution. Soil Vegetation Symbiosis: Biotic Communities and Succession. **5. Ecosystem**: Concept

of Ecosystem, structure and functioning of Ecosystem. Types of Ecosystem, Major Biomes, Man's impact on the ecosystem and global ecological issues.

SECTION - B- HUMAN GEOGRAPHY
1. Evolution of Geography Thought: Contributions of German, French, British, Soviet and Indian Geographers: Changing Paradigms of Man Environment Relationship Impact of Positivism and Quantitative revolution; models and systems in geography. Recent trends in geographic thought with special reference to radical, behavioural phenomenological and ecological paradigms. **2. Human Geography**: Human habitat in space, natural regions: Emergence of Man and Races of Mankind; Cultural evolution and stages; Major cultural realism. Growth and Distribution of population; International migration population. Demographic Transition and contemporary population problems. **3. Settlement Geography**: Concept of Settlement Geography: Rural settlement; Nature; Origin, Types and pattern, concept of Urban settlement. Patterns, Processes and consequences of Urbanisation; Central place theory; classification of town; Hierarchy of urban centres. Morphology of Town; Rural Urban nexus; Uniaid and urban fangs. **4. Economic Geography**: Fundamental concepts. Concepts of Resources: Conservation and Management Nature and Types of Agriculture; Agricultural land use location theories; World agricultural regions; Major crops: Mineral and Power Resources Occurrence, Reserve, utilization and production patterns, World Energy crisis and search for alternatives. Industries- Theories of Industrial location, Major industrial regions; Major Industries- Iron & Steel, Paper, Textiles, Petro-Chemicals, Automobiles, Ship building; their location patterns. International Trade; Trade Blocks, Trade routes. Ports and global trade centres. World Economic Development Patterns. Concepts of and approaches to Sustainable Development. **5. Political Geography**: Concept of Nation and state Frontiers, Boundaries and Buffer zones; Concepts of Heartland and Rimland Federalism, Contemporary world geopolitical issue.

PAPER - II GEOGRAPHY OF INDIA
1. Physical Features: Geological systems and structure: Relief and drainage, soils and natural vegetation; soil degradation and deforestation. Origin and mechanism of Indian Monsoon; Climatic regionalisation; Physiographic regionalisation **2. Human Feature**: Distribution and growth of population; structural characteristics of population-temporal-regional variations. Regional rural settlements patterns and village morphology. Urban Settlement; Classification of Indian Cities- location, functional, hierarchically regions Urban morphology, urbanisation and urban policy. **3. Agriculture**: Infrastructure; irrigation, power, fertilizer use, mechanization; Regional characteristics of agricultural land use, problem of wastelands and their reclamation, Cropping patterns and intensity; Agricultural Efficiency and Productivity, Impact of Green revolution; Agricultural regions with special reference to agroecological conditions. Land reforms and agrarian problems Crop Combinations and agricultural regionalisation. Modernisation of Agriculture and agricultural planning. **4. Mineral and Power Resources**: Location, patterns, Reserves and Production trends; Complementarity of minerals. Power resources, Coal petroleum, hydro power, Multipurpose river valley projects; Energy crisis and search for alternatives. **5. Industries**: Industrial Development, Major industries-non & steel. Textiles, paper Cements, Fertilizers Sugar, Petro-chemicals, industrial Complexes and Regions. **6. Transport and Trade**: Networks of railways and roads; Problems and prospects of Civil aviation and water transport; inter-regional commodity flows; International trade, policy and flow patterns. Major ports and trade centres. **7. Regional Development and Planning**: Problems of regional development and spatial planning strategies: Geographic and Planning regions; Planning for metropolitan, tribal, hilly, drought-prone regions and watershed management. Regional disparities in development and policies in five year Plans; Planning for Eco-Development. **8. Political Economy**: Historical Perspective on Unity and diversity. States reorganisation; Regional consciousness and national integration geographical basis on centre -state relations. International boundaries of India and related geo-political issues India and the geopolitics of Indian ocean. India and the SAARC.

7. ECONOMICS: PAPER-I: ECONOMIC THEORY (SECTION-A)
1. Consumer Demand and Consumer Sovereignty: Law of Demand, Nature and types of elasticity of demand, indifference curve analysis and consumer's equilibrium. **2. Theory of Production**: Production Function, Laws of Returns, Equilibrium of a Producer, Nature of Cost and Revenue curves, Pricing of factors of production. **3. Price and output determination**: Under different market conditions. Cost plus pricing. **4. Equilibrium**: General and Partial, Stable and Unstable. **5. Concepts of Economic Welfare**: Old and New Welfare economics, Pareto Optimality and compensation principles, Consumer's surplus. Economics welfare and Competition. **6. National Income**: Concept, Components and methods of accounting. Classical and Keynesian Theories of Employment and Income. Pigou effect and Real balance effect; Intersection of Multiplier and Accelerator. Theory of Trade Cycles. (Monetary and Hicksian trade cycles). **7. Theory of Money**: Measurement of changes in price level. Theory of money supply Money Multiplier. Quantity theory of Money. Theories of Demand for money, Interest determination, IS-LM curve analysis. Theory of Inflation, Measures of inflation control. **8. Monetary and Banking System**: Banks and their roles in the economy. Central Bank and the money market, Techniques of monetary Management.

SECTION - B
(i) Public Finance: Theories of Taxation and Public Expenditure, Incidence of taxation, evasion and shifting of Tax burden, Effects of Taxation, Fiscal Policy and economic development, economic classification of Budgetary Receipts and Expenditure, Types of budget deficits and their effects on the economy. **(ii) International Economics**: Theories of International Trade, Heckscher-Ohlin theory. Offer Terms of Trade, Trade and Development Balance of Payments, Disequilibrium in Balance of Payments and policies for correcting it. Fixed and fluctuating exchange rates, Free Trade vs. Protection, Foreign Debt and Debt management, International Monetary and Trade Institutions. **(iii) Growth and Development**: Measures of Economic development. Theories of Economic Growth; Classical, Marxian and Harrod-Domar Model, Surplus Labour and capital formation, stages of growth. Problem of Human Capital formation.

PAPER-II INDIAN ECONOMY
1. Basic Features of Indian Economy: Trends in National Income and per capita income. Changes in composition of National Income. Population Growth and Economic Development, Characteristics of India's Development. Infrastructure & Infrastructure Development. Energy Crisis, Environmental pollution and its control. **2. Indian Agriculture**: Importance of agriculture in Indian economy. Source of growth in agriculture. Institutional reforms in Indian agriculture with special reference to land reforms and credit supply. Agricultural cost and product pricing. **3. Industrial growth and Structure in India**: Public Sector. Private Corporate Sector Joint Sector. Small Scale and Cottage Industry in India: Industrial Policy resolutions; competition and industrial development. Changes in exchange rates, Free Trade vs. Protection, Foreign Debt and Debt management, International Monetary and Trade Institutions. **(iii) Growth and Development**: Measures of Economic development. Theories of Economic Growth; Classical, Marxian and Harrod-Domar Model, Surplus Labour and capital formation, stages of growth. Problem of Human Capital formation.

8. SOCIOLOGY: PAPER-I GENERAL SOCIOLOGY (SECTION-A)
1. Fundamentals of Sociology and Study of Social Phenomena: Emergence of Sociology, its nature and scope. Methods of study: Problem of objectivity and issues of measurement in Social Science; Sampling; Research Design: Descriptive, Exploratory and Experimental; Techniques of data collection; Observation, Interview schedule and questionnaire. **2. Theoretical Perspective Functionalism**: Redford Brown, Malinowski and Merton. Concept of Herbert Karl Marx, Raif Dahrendorf and Lewiscoser. **Symbolic Interactionism**: C.H. Cooley, G.H. Mead and Therbert Blumer. **Structuralism**-Levi: Strauss, S.F. Nadel, Parson and Merton. **3. Pioneers in Sociology**: A. Comte-Positivism and Hierarchy of Sciences. H. Spencer- Organic analogy and the doctrine of evolution. K. Marx- Dialectical materialism and alienation. E. Durkheim-Division of labour. Sociology of religion. Max Weber-Social action and idea type. **4. Social Stratification And Differentiation**: Concept. Theories of Stratification: Marx Weber, Davis and Moore, Types-Caste and Class. Status and Role, Social Mobility-types: Occupational Mobility -Intra-Generational and inter Generational.

SECTION - B
5. Marriage, Family And Kinship: Type and forms of marriage, impact of social legislation. Family: Structure and functions; Changing patterns of family; Family decent and kinship; Marriage and sex roles in modern society. **6. Social Change and Development**: Concept, Theories and Factors of Social Change, Social movement and change. State intervention. Social policy and development, Strategies of rural transformation; Community development programme I.R.D.P., TRYSEM and Jawahar Roggar Yojana. **7. Economic and Political System**: Concept of property. Social dimensions of division of labour. Types of exchange, Industrialisation, Urbanisation and Social Development, Nature of Power, Personal, Community Elite, Class. Modes of political participation-Democratic and Authoritarian. **8. Religion, Science and Technology**: Concept, Role and religious belief in traditional and modern societies. Ethos of science, Social responsibility and control of science: Social consequences of science and technology. **9. Population and Society**: Population size, Trends, Composition, Migration Growth, population Problems in India, Population, education.

PAPER-II: Indian Social System (Section-A)
1. Bases of Indian Society: Traditional Indian Social Organisation: Dharma, Doctrine of Karma, Ashram Vyavastha Purushartha and Samskars; Socio-Cultural Dynamics impact if Buddhism, Islam and the west. Factors responsible for continuity and change. **2. Social Stratification**: Caste system-Origin, Structural Cultural views. Changing patterns of caste: Caste and class: Issues of equality and social justice: Class structure in India-Agrarian and industrial: Emergence of middle class. Classes among the tribes; Emergence of Dalits consciousness. **3. Marriage Family and Kinship**: Marriage among different ethnic groups, its changing trends and future: Family-its structural and functional aspects Changing pattern, Impact of legislations and socio-economic changes of marriage and family, Regional variations in kinship system and its changing aspect. **4. Economic and Political System**: Jainami System, Land tenure system. Social consequences of land reforms and liberalisation, Social Determinants of economic development, Green revolution, Functioning of democratic political system. Political parties and their composition, Structural change and orientation among political parties. Realisation of power and political participation, Political implications of development. **5. Education and Society**: Dimensions of education in traditional and modern societies, Educational equality and change; Education and social mobility. Problems of education among the weaker sections of the society.

SECTION - B
6. Tribal, Rural and Urban Social Organisation: Distinctive features of tribal communities and their distribution; Tribe and caste, Process Acculturation, Assimilation and integration. Problems of tribal's social identity. Traditional power structure. Demeritisation of village community. Community development leadership. Community development programme and Panchayati

Continued....

Size : 25 cm x 38 cm = 950 Sq. cm.

Page No. : 6

(Anu Image Maker)

- Continued...

Size : 25 cm x 38 cm = 950 Sq. cm.
Page No. : 9
(Anu Image Maker)

(Anu Image Maker)

- Continued... -

Permanent way ballast, sleeper, chair and fastenings; point and crossings, different types of turn outs, cross-over setting out of points. Maintenance of track super elevation, creep of rails, ruling gradients, track resistance, regulation effort curve response and its measurement. Station buildings, platform signals, turn tables. Signals and interlocking: level crossings.

Roads and Runways: Classification of roads planning geometric design. Design of flexible and rigid pavements; subbase and weathering surfaces. Tram engineering and traffic survey, intersections roads signs, signals and markings.

(c) Surveying: Plan table Surveying Equipment & methods, solution of 3 & 2 point problems, Errors and precautions. Triangulation, Great Trigonometrical Survey of India. Errors and least squares method general methods, of least squares method with interdisciplinary approach. Adjustment of level nets and triangular nets. Matrix notation solution. Layout of curves; Simple, compound, reverse transition and vertical curves. Projects surveys and layout of Civil Engineering works such as buildings, bridges, tunnels and hydroelectric project. Introduction to photogrammetry and Remote sensing.

PART-B

(a) Water Resources Engineering: Hydrology-Hydrologic cycle: precipitation; evaporation-transpiration and infiltration hydrographs; units hydrograph; units hydrograph: Flood estimation and frequency. Planning for water Resources Ground and surface water resources; surface flows. Single and multipurpose projects storage capacity, reservoir losses; reservoir silting flood routing. Benefit cost ratio, General Principles of optimization. Elements of water Resources management. Water requirements for crops-quality of irrigation water, consumptive use of water, water depth and frequency of irrigation; duty of water; irrigation methods and efficiencies. Distribution system for canal irrigations determination of required channel capacity channel losses. Alignment of main and distributary channels. Waterlogging its causes and control, design of drainage system; soil salinity. River training principles and methods storage worktypes of Dams (including earth dams) and their characteristics, principles of design, criteria for stability. Foundation treatment: joints and galleries, control of seepage. **(b) Sanitation and water supply:** Sanitation-site and orientation of Buildings, vantage-proof course house drainage conservancy and water-borne system of waste disposal sanitary appliances, latrines & urinals. **(c) Environmental Engineering:** Elementary principles of ecology and eco systems and their interaction with environment. Engineering activity and environment pollution. Environment and its effect on human health and activity. Air environment: major pollutants and their adverse effects, types of air cleaning devices. Water quality: parameters, adverse effects, monitoring, purification of streams, solid waste collection and disposal methods, their selection and operation. Typical feature of water distribution systems: Demand, available need network analysis, storage, corrosion. **Typical features of sewerage systems:** Permissible velocities. Partial flow in circular sewers, non-circular section, corrosion in sewers, construction and maintenance sewer appurtenances. Pumping of sewage, pumping standards and systems, environmental management.

23. MECHANICAL ENGINEERING: PAPER-1 (PART-A)

1. Theory of Machines: Kinematics and dynamic analysis of planer mechanism. Belt and chain drives. Gears and gear trains. Cams, Flywheel, Governors. Balancing of rotations and reciprocating masses, single and multi cylinder engines. Free, forced and damped vibrations (single degree of freedom) Critical speeds and whirling of shafts. Automatic controls.

2. Mechanics of Solids: Stress strain relationship and analysis (in two dimensions). Strain energy concepts. Theories of failure. Principal stresses and strains. Mohr's construction. Uniaxial loading. Thermal stresses. Beams bending moment shear force, bending stresses deflection. Shear stress distribution. Torsion of shafts. Helical springs. Thin and thick walled pressure vessels. Shrink fitts Columns. Rotating discs.

3. Engineering Materials: Structure of solids-basic concepts. Crystalline materials imperfections. Alloys and binary phase diagram-Structures and properties of common engineering materials and applications. Heat treatment of steels. Polymers. Ceramics. Composed materials.

PART-B

4. Manufacturing Science: Manufacturing process basic concepts mechanics of Metal cutting. Merchant's force analysis. Taylor's tool life equation. Machinability. Economics of machining. Addmation. NC and CNC. Recent machining method-EDM, ECM, EMB, LMB, PAM and USM. Analysis of forming processes. High energy rate forming. Jigsaw fudures. Cutting tools Gauges, Inspection of lengths angles and surface finish. **5. Manufacturing Management:** Product development. Value analysis. Break even analysis. Forecasting techniques Operations Scheduling. Capacity planning. Assembly Fine balancing. CPM and PERT inventory control. ABC analysis. EOC model. Material requirement. Planning Job design. Job standards. Method study and work measurement. Quality management. Quality analysis. Control chart. Acceptance sampling. Total quality management. Operations research. Linear programming. Graphical and simplex method. Transportation and assignment models. Single server queuing model. **6. elements of Computation:** Computer organization. Flow charting features of common computer languages. Fortran. Dbase, Lotus, 1-2-3, c. Elementary programming.

PAPER-II (PART-A)

1. Thermodynamics: Basic concepts First law and its application. Second law its corollaries and applications. Maxwell and T-ds equation. Clapeyron equation. Availability and irreversibility. **2. Heat Transfer:** Laws of heat transfers One and two dimensional steady state heat conduction. Heat transfer from extended surfaces. One dimensional unsteady state heat conduction. Free and forced convective heat transfers Dimensional analysis. Heat exchangers. Radiation laws. Shape factors. Heat exchangers between black and non-black surfaces. **3. Refrigeration and Air conditioning:** Vapour compression, absorption, steam jet and air refrigeration system. properties of refrigerants, compressors, condensers. Expansion valve and evaporators. Psychrometric processes. Comfort zones. Cooling load calculations. All the year round air conditioning systems.

PART-B

4. Internal Combustion Engines: SI and CI engines. Four stroke and two stroke engines. Valve timing diagrams. Combustion phenomena in SI and CI engines. Detonation and knocking. Choice of engine fuel. Octane and cetane ratings. Combustion of fuels. Engines emission and controls Engine trial. **5. Turbomachines:** Classification of turbomachines continuity, momentum and energy equation. Adiabatic and isentropic flow. Flow analysis in axial flow compressors and turbines. Flow analysis in centrifugal pumps and compressors. Dimensional analysis and modeling. Performance of pumps, compressors and turbines. **6. Power plants:** Selection of site for steam, hydro, nuclear and gas power plants. Modern steam generators. Draft and dust removal equipments. Fuel and cooling water system. Thermodynamic analysis of steam power plants. **Governing of turbines:** Thermodynamic analysis of gas turbines power plants. Non-conventional power plants solar thermal and wind generator. Economic power generation.

24. ELECTRICAL ENGINEERING: PAPER-1

(i) E.M. Theory. Analysis of Electrostatic and magnetostatic fields. Laplace Poisson & Maxwell's equation. Electrostatic wave and wave equations. Poynting's Theorem. Waves on transmission lines. Wave guides. Microwave resonators. **(ii) Networks & Systems.** Systems and signals, Network Theorems and their application. Transient and steady state analysis of systems. Transform techniques and circuit analysis. Coupled circuits. Resonant circuits Balanced three phase circuits. Network functions. Two port network. Network parameters. Elements of network synthesis. Elementary active networks **(iii) Electrical & Electronic Measurement & Instrumentation:** Basic methods of Measurement. Error analysis, Electrical Standards. Measurement of voltage, Current, power energy, power factor, resistance, inductance, capacitance, frequency and loss angles. Indicating instruments. DC and AC Bridges. Electronic measuring instruments. Multimeter, digital voltmeter, frequency counter, Q-meter, oscilloscope Techniques special purpose CROs. Transducers and their classification. Temp Displacement, strain pressure, velocity transducers, Thermo-couple, thermistor, LVDT, strain gauges, piezo-electric crystal etc, transducers. Applications of transducers in the measurement of non-electrical quantities like pressure, temperature, displacement, velocity, acceleration, flow rate etc. Data-acquisition systems. **(iv) Analog & Digital Electronics:** semiconductor and semiconductor diodes & zener-diode/ Bi-polar junction transistor and their parameters. Transistor biasing, analysis of all types of amplifiers including feedback and d.c. amplifiers. Operational amplifiers and their application. Analog computers. Feedback oscillators-colpits and Hartley types, waveform generators. Multivibrators. Boolean algebra. Logic gates. Combinational and sequential digital circuits. Semiconductor memories. A/D & D/A converters. Microprocessor. Number system and codes, elementary microprocessors & their important applications. **(v) Electrical Machines:** D.C. Machines; commutation and armature reaction, characteristics and performance of motors and generators. Applications, starting and speed control. Synchronous generators: Armature reaction, voltage regulation parallel operation. Single and three phase induction motors. Principle of operation, performance characteristics, starting and speed control. Synchronous Motors. Principle of operation performance analysis, Hunting. Synchronous condensers. **Transformers:** Construction phase of diagram, equivalent circuit, voltage regulation. Performance. Auto transformers, in instrument transformers. Three phase transformers. **(V) Material Science:** Theory of Semiconductors. Conductors and insulators. Superconductivity. Various insulators used for Electrical and Electronic applications. Different magneti materials, properties and applications. Hall effect.

PAPER-II (Section A)

1. Control Engineering: Mathematical Modelling of physical dynamic systems. Block diagram and single flow graph. Transfer function. Time response and frequency response of linear systems. Error evaluation Blode- Plot, Polar Plot and Nichol's charts, gain Margin and phase Margin Stability of linear feedback control systems. Routh-Hurwitz and Nyquist criteria. Route focus technique. Design of compensators. State-variable methods in system modelling, analysis and design. Controllability and observability and their testing methods. Polo placement design using state variables feedback. Control system components (Potentiometers, Tachometers, Synchros & Servomotors). **2. Industrial Electronics:** Various power semiconductor devices, Thyristor & its protection and its applications. Single phase and poly phase rectifiers. Smoothing filters, D.C. regulated power supplies. Controlled converters and invertors, choppers. Cyclo-converters A.C. voltage regulators. Application to variables speed, drives induction and dielectric heating. Timers and welding circuits.

SECTION - B (BEHAVIOUR CURRENT)

(3) Electrical Machines: 1. Fundamentals of electro-mechanical energy conversion. Analysis of electromagnetic torque and induced voltages. The general torque equation. 2-3- Phase induction motors. Concept of revolving field. Induction motor as a transformer. Phase or diagram and equivalent circuit. Performance evaluation. Correlation of induction motor operation with basic torque relations. Torque-speed characteristics. Circle diagram starting and speed control methods. **3. Synchronous Machines:** Generation of e.m.f. Linear and non-linear and analysis. Equivalent circuit. Experimental determination of leakage and synchronous reactance. Theory of synchronous machines. Power equation. Parallel Operation. Transient and subtransient reactances and time constants. Synchronous motor. Phasor diagram and equivalent circuit. Performance, V-curves. Power factor control, hunting. **4. Special machines:** Tow phases a.c. servomotors. Equivalent circuit and performance stepper motors. Methods of operation, Drive amplifiers. Half stepping. Reluctance type stepper motor, Principles and working of universal motor. Single phase a.c. compensated series motor. Principle and working of charge motor.

(4) Electric Drive: Fundamentals of electric drive. Electric drive Rating estimation. Electric braking. Electromechanical transients during starting and braking time and energy calculations. Load equalization. Solid State control of d.c. three phase induction and synchronous motors. Applications of electric motors. **(5) Electric Traction:** Various Systems of track electrification and their comparison. Mechanics of train movement. Estimation of tractive effort and energy requirement. Electrification and their comparison. Mechanics of train movement

Estimations of tractive effort and energy requirement Traction motors and their characteristics. **(6) Power Systems and Protection:** 1. **Types of Power Station:** Selection of site. General layout of thermal hydro and nuclear stations. Economics of different types. Base load and peak load stations. Pumped storage stations. 2. **Transmission and Distribution:** Transmission systems. Transmission line parameters and calculations. Performance of short. Medium and long transmission line A.B.C.D. parameters. Insulators. Mechanical design of overhead transmission lines and Sag calculation, corona and its effects, Radio interference. EHV AC and HVDC transmission lines underground cables. Per unit representation of power system. Symmetrical and unsymmetrical fault analysis. Symmetrical components and their application fault analysis. Load flow analysis using gauss-seidel and Newton-Raphson methods. Fast de-coupled load flow. Steady state and transient stability. Equal area criterion Economic operation and power system incremental fuel costs and fuel rate. Penalty factors. ALFC and AVR control for real time operation of inter connected power system. **3. Protection:** Principal of arc extinction. Classification of circuit breakers. Restriking phenomenon. Calculation of restriking and recovery voltages. Interruption of small inductive and capacity N currents. Testing of Circuit Breakers. **4. Relaying Principles:** Primary and back-up relaying over current protection and directional relaying principles. Constructional details. Protection schemes for transmission line transformer generator and bus protection. Current and potential transformer and their applications in relaying traveling waves. Protection against surges, Surge impedance.

(Or)

SECTION - C (Light Current)

(7) Communication Systems: Amplitude, Frequency and phase modulation and their comparison. Generation and detection of amplitude frequency, phase and pulse modulated signals using oscillators. Modulators and demodulators. Noise problems Channel efficiency. Sampling theorem. Sound and vision broadcast transmitting and receiving systems. Antennas and feeders. Transmission lines at audio, radio and ultrahigh frequencies. Fiber optics and optical communication systems. Digital communications pulse code modulation. Data communication state-side communication. Computer communication system- LANISDN etc. Electronic Exchanges. **(a) Microwaves:** Electromagnetic waves unguided media wave guides. Cavity resonators. Microwave filters, Microwave tubes, Solid State Microwave devices. Microwave amplifiers. Microwave receivers Microwave filters and measurements. Microwave antennas.

25. English Literature: Paper-1

Detail study of literary age (19th century): the paper will cover the study of English Literature from 1798 to 1900 with special reference to the works of William Word worth, Coleridge, Shelly, Keats, Lamb, Hazlitt, Thackeray, Dickens, Tennyson, Robert Browning, A.C. Swinburne, D.G. Rossetti, Carlyl and Ruskin. The candidates will be required to evince first hand reading. The paper will be designed to test candidates through understanding of the main literary trends during the period with reference to the authors prescribed. Questions on the social and cultural background to the period will be also set.

Paper - II

The paper will be designed to test candidates first hand reading of the text alongwith their ability to examine literary problems critically. **1. William Shakespeare:** Twelfth Night Henry IV Pt. J. Hamlet, The Tempest. **2. John Milton:** Paradise Lost Book-1 & II 3. Jane Austen: Pride and Prejudice. **4. W. Wordsworth:** "Immortality Ode" "Tintern Abbey" **5. Dickens:** Great Expectations. **6. Graham Green:** The power and the Glory. **7. William Golding:** Lord of the Flies. **8. W.B. Yeats:** "The Second Coming" "Bizarium". "Sailing to Bizarium", "A Prayer for my Daughter". "Leda and the Swan". **9. T.S. Elliot:** The Wasteland. **10. D.H. Lawrence:** Sons and Lovers.

26. URDU PAPER-1: PART-A

(1) Development of Urdu Language: (a) Western Hindi and its dialects mainly Khari Boli, Braj Bhasha and Haryanvi. (b) Persio-Arabic elements in Urdu. (c) Urdu Language from 1200 AD to 1700 AD (d) Different theories of the origin of Urdu language. **(2) (a)** Development of Urdu Literature in Deccan (b) Two Classical Schools of Urdu poetry- Delhi & Lucknow. (c) Development of Urdu prose upto Ghali (3) (a) Aligarh movement. Romantic trends of progressive movement and their impact on Urdu Literature. (b) Urdu literature after independence.

Part - B

(1) Important genesis of poetry: Ghazal, Qasida, Masnavi, Rubai, Quata Naam, Blank Verse, Free Verse (2) Importance of prose - Destan, Novel Short Story, Dama. Literacy Criticism. Biography, Essay. (3) Role of Urdu literature in freedom movement.

PAPER - II

This paper will require first hand reading of the texts prescribed and will be designed to test the candidates critical ability.

PAPPER - A (PROSE)

(1) Meer (Amman): Bagh-o-Bahar. **(2) Ghali:** Intakhab-e-Ghali. Ed: Dr. Khaliq Anjum. **(3) Hali:** Muqaddam-e-sher-o-Shairi. **(4) Ruswa:** Umrao Jan Ada (5) Prem Chand: Prem Chand ke Numanda Afshan. Ed. Prof. Qamar Rais. **(6) Abul Kalam Azad:** Ghubar-e-Khatir. **(7) Imliaz Ali Taj:** Anarkali. **(8) Quratul Ain Hyder:** Akhir-e-Shab ke Hamsafar.

PART - B (POETRY)

(9) Meer: Intakhab-Kalam-e-Meer. Ed: Abdul Haq. **(10) Sauda:** Qasaid-e-Sauda (including Hajarjariyat) **(11) Ghali:** Diwan-e-Ghali. **(12) Iqbal:** Kulliyat-e-Iqbal (Bal-e-Ghbiral only) **(13) Jush Malihabadi:** Safi-o-Nagma (14) Firaq Gorakhpuri: Gul-e-Naghma. **(15) Faiz:** Nushkaha-e-Nafas (Naqsh-e-Fariadi, Dast-e-Saba, Zuridamm Nama only). **(16) Akhtar-ul-Imam:** Sar-o-Saman (Treek Salarya ke Bar, Binti-e-Lamhat only)

27. ARABIC: PAPER-1

1. (a) Origin and development of the language in outline. **(b)** Significant features of the grammar of the language and Rhetoric The following topics.

الضم والفتح والجر
البناء والهدم والتركيب
الاشتقاق والاشتقاق
الاشتقاق والاشتقاق

2. Literary History and Literary Criticism: Literary movement. Socio-cultural influence (Classical Background) and modern trends. Origin & Development of modern literary genres including novel, short story, drama & essay.

PAPER - II

This paper will require first-hand reading of the text prescribed and will be designed to test the candidate critical ability.

SECTION A: Poets

1. Imraul Qasis: His Mullaqaq: (Complete)
'Qifa Nabki min Zakra Habibbin was Manzili'
2. Zuhair bin Abi Sulma: His Mullaqaq (complete)
'A'min Umni Aufa Diminatum lam takallami'
3. Al- Khansa: The following two elegies from her Diwan
i) Ta' azzara Bial-majd (Complete)
ii) Uzakkiruni (Complete)
4. Hasan bin Thabit: The following Qasaid from his Diwan: Qasida No. I to IV

قصيدته
قصيدته
قصيدته
قصيدته

5. Umar bin Abi Rabiya: The following four Ghazals from his Diwan:

قصيدته
قصيدته
قصيدته
قصيدته

6. Al-Farazdaq: The following 4 Qasaid from his diwan
i) In praise of Umar bin Abd al-Aziz (complete)
ii) In praise of Zain al-Abidin Ali bin Hasan (complete)
iii) Wa Atlasa Assalin Wa Kana Sahiba (Complete)
iv) Wa Kumin Tanamuhii Adhyal Anan (Complete)
7. Abu Tammam: The following two from his Diwan:
i) Yarudahu Aba-hasan (complete)
ii) Al wa'z wa al Zuhd (Complete)

قصيدته
قصيدته

8. Ahamad al Shawqi: The following four Qasaid from his Diwan (Al-shawqiati):
i) Masjid Aya Sufiyah (Vol. II) (complete)
ii) Ghaba Bulunia (vol.II) (Complete)
iii) Salamun Min Saba (Vol. II) (complete)
iv) Al- Hamziah al- Nabawiyyah (Vol.I) (complete)

قصيدته
قصيدته

SECTION B: Authors

1. Iban a Maqaffa: "Kailla wa Dimna" Chapter (Complete) (excluding Muqaddamah)
'Al-Asad Wa Al-Thaur'
2. Ibu Khauldun: Muqadamah, 39 Pages, part Six from the fist chapter: From 'Al fast al-Sadis to wa min Faruhi aljabr- wa - al Muqabilah'.
3. Al-manfaluti: Al- Nazarat Vol 1 Egypt 1950

قصيدته
قصيدته

The following stories:
i) Al-sidq wa al- kizb
ii) Al-Bauz wa allnsan
iii) Fi sabit Al- Ihsan
iv) Al-ghani wa al- Faqr

قصيدته
قصيدته

4. Ahmad Amin: Hayati (Autobiography complete)
5. Taufiq al- Hakim: Drama: "Shahr Zad (complete)

قصيدته
قصيدته

Section - C

Translation from Urdu to Arabic.

Note: Candidates will be required to answer some questions carrying not less than 10 per cent marks in Arabic also.

Continued...

<p>28. हिन्दी साहित्य: प्रथम प्रश्न-पत्र (भाग-1) हिन्दी भाषा तथा न्यायसिद्धि का इतिहास</p> <p>1. पाणी, प्रकृत एवं अभ्युक्त तथा पुरानी हिन्दी का संक्षिप्त अध्ययन। 2. मध्य काल में ब्रज और अवधी का साहित्यिक भाग के रूप में विकास। 3. खड़ी बोली तथा भाषा का विकास। 4. रासभाषा, समकालीन भाषा, पुरुषभाषा एवं समकालीन भाषा के रूप में विकास। 5. वैदिक और खलीली क्षेत्र में हिन्दी भाषा की स्थिति। 6. हिन्दी भाषा का क्षेत्र और अवधी, ब्रज, खड़ी बोली, पंजाबी, गुजराती का सामान्य परिवर्तन 7. मानक हिन्दी का व्याकरणिक स्वरूप। 8. न्यायसिद्धि उद्भव और विकास, देवनागरीलिपि की स्वरूप एवं समाधान। 9. हिन्दी शब्द-साधना।</p> <p>भाग-2 हिन्दी साहित्य का इतिहास</p> <p>1. हिन्दी साहित्य के इतिहास लेखन की परम्परा। 2. हिन्दी साहित्य के इतिहास में काल विभाजन तथा नामकरण। 3. आदिकाल: भक्तिकाल, रीतिकाल, आधुनिक काल की प्रमुख प्रवृत्तियाँ। 4. आधुनिक काल: पूर्वजागरण और भारतेन्दु काल, द्वितीय युग, छायावाद, प्रगतिवाद, प्रयोगवाद नवी कविता एवं परवर्तीकाल धाराएँ: (क) हिन्दी उपन्यास, हिन्दी कहानी, हिन्दी नाटक: उद्भव विकास एवं इनकी आधुनिकता प्रवृत्तियाँ। (ख) हिन्दी निम्न तथा अन्य गद्य विधाएँ: रेखाचित्र, सम्मेलन, यात्रा कृतान्त। (ग) हिन्दी आलोचना का प्रारंभ और विकास: प्रमुख आलोचक: रामचन्द्र शुक्ल, नन्ददुलारे बाजपेयी, हजारी प्रसाद द्विवेदी, नागेन्द्र, मुक्तिबोध, रामविलास शर्मा, नामवर सिंह।</p> <p>हिन्दी साहित्य : द्वितीय प्रश्न-पत्र भाग- प्रथम</p> <p>इस प्रश्न-पत्र में निम्नलिखित चर्चाओं में से व्याख्या एवं उन पर आलोचनात्मक प्रश्न पूछे जायेंगे। कवियों प्रकाशिता, सम्पादक-श्याम सुन्दर दास, साक्षी संख्या 1 से 100 तक और पद संख्या 1 से 20 तक।</p> <p>सूत्रादा (धर्म गीत सार) सम्पादक-रामचन्द्र शुक्ल, प्रारम्भ से एक सी पद तक, तुलसीदास- रामचन्द्र मानस उत्तरकाव्य। जायसी (पद्मावत), सम्पादक-रामचन्द्र शुक्ल (सिंहलीय खण्ड और नाममती विराट खण्ड) बिहारी संहार (प्रारम्भ से 100 दोहे तक) हिन्दी संस्कृत प्रकाशन, झापाबाद।</p> <p>जयशंकर प्रसाद: कामायनी- (चिन्ता और ब्रह्मा संगी) सुमनानन्द पन्ना-नीका विहार, परिवर्तन, निरास-राम की शक्ति पूजा, अक्षय-असाध्ययोग, मुक्तिबोध-ब्रह्मराक्षस, नारायण-बादल को चिरो देखा है, अकाल के बाद।</p> <p>भाग द्वितीय</p> <p>भारतेन्दु हरिश्चन्द्र-भारत दुर्दशा, जयशंकर प्रसाद-स्कन्द गुप्त, रामचन्द्र शुक्ल, चिन्तामणि भाग-एक (कविता क्या है, ब्रह्मा और भक्ति) प्रेमचन्द-गोदान, प्रेमचन्द की संश्लेषक कहानी, समस्त अनुभव, दयाल-दिवा, कालिदास नारायण रेणु मैत्रा अविना।</p> <p>29. PERSIAN : PAPER - 1</p> <p>Unit - I - 1. Short essay in Persian (Compulsory). Unit - II - 2. (a) Origin and development of the language. (Old Persian, Pahlavi, Modern Persian). (b) Applied Grammar. (c) Rhetorics. (d) Prosody (Bahri-i-Hazaj Kamil, Bahri-i-Motagharib Mahzuz/ Maqsur, Bahri-i-Rajaz Kamil). Asbab, Autad, Fawasil, Haruf-i-Qafaa. Unit - III - 3. Literary History, Criticism, Movements: Socio-cultural influences, Modern Trends. (a) Samanid Period: (Important Poets and Writers) (b) Ghaznavid Period: (Firdausi) Rumi, Masud Sad-i-Salman, Tarikh-i-Balhiq. (c) Saljuqid Period: (Anwar Altar, Khayyam, Kimya-i-Saadat, Chahar Maqala, Siyasat Nama). (d) Ilkhanid Period: (Sa'di, Rumi, Jami, 'Ulu- Tawarikh, Tarikh-i-Jahan Khusa). (e) Timurid Period: (Hafiz-i-Salman Saaji, Khajau-i-Kirmani, Zafar Nama-i-Sharfu'ddin Yazid, Tazkira-Daulat Shah Samarqandi, Jami) (f) Indo-Persian Literature: (Aufi, Khusrav, Faizi, Urfi, Naziri, Abul Fazl, Tarikh-i-Firuz Shahi of Barani, Chahar Chaman of Brahman, Ghalib, Iqbal). (g) Safavid to Modern Period: (Mohammad Kashi, Qaani, Malik-ushshu'ara Bahar, Nimayushi, Parwin-i-Etesami, Simin Behbahani' Sadiq-i-Hedayat, Jamalzada, Hejazi-Sabk-i - Khurasani, Sabk-i-Eraqi, Sabk-i-Hindi, Islamic Revolution of Iran). Unit - IV - 4 Translation of ten out of fifteen simple sentences of Urdu into Persian (Compulsory).</p> <p>PAPER - II</p> <p>The paper will require first hand reading of the texts prescribed and will be designed to test the candidates critical ability.</p> <p>Unit - I - 1. Prose - 1. Translation from the following texts: (a) Nizami Aruzi Samarqandi, Chahar Maqala (Dabire and Shari). (b) H Shirazi Gulistan (Der Sirat-i-Padshahan and Dar Akhlaq-i Derwishes). (c) Ziauddin Barani, Tarikh-i-Firuz Shahi (Wasaya-i Sultan Balban be Ferzand-o-Wali Ahd-i Khud). (d) Sadiq 'ad-Hidayat Dashi Akul, Talabi-i-Amorzi, Girdab. Unit - II - 2. Critical and biographical comments about the prescribed authors and their works (4 questions). Unit - III - 3. Poetry - 3. Explanation from the following texts: (a) Firdausi, Shahnam (Dastan-i Rostam-o-Sohrab and Dastan -i- Bizar -o- Maniza). (b) Umar-i-Khayyam, Ruba'iyat (Radif Alif). (c) Maulana Rumi, Mathnawi (Hikayat-i-Shaban-o Musa, Hikayat-Hekayat -i- Hakim Umar-o Qasid -i- Rum and Hikayat-i-Baqalo-Tuti). (d) Amir Khusrav, Ghaziliyat (Radif Alif). (e) Hafiz-i-Shirazi, Ghaziliyat (Radif Alif). (f) Urfi-i-Shirazi, Qasidas (Dar tausif -i- Kashmir and Madhi-i-Shahzada Salim). (g) Bahar -a- Mashhadi Diwan-i-Bahar (Jughd-i-Jang, Shababang, Damawandiya, Wataniya). Unit - IV - 4. Critical and Biographical questions regarding the poets and their work prescribed (4 questions) Unit - v - 5 Translation of an unseen Passage from English into Persian.</p> <p>30. SANSKRIT LITERATURE: PAPER-1 खण्ड-क-भाषा विज्ञान (Linguistics)</p> <p>भाषा का उद्भव और विकास, भाषाओं की वर्गीकरण, भारतीय एवं मध्यकालीन भारतीय अर्थभाषाएं अर्थपरिचय की दिशाएं तथा कारण, ध्वनित्व, ध्वनिपरिचय के कारण, संस्कृत ध्वनित्व के विशेष संघर्ष में मानवीय वाक्य एवं लौकिक संस्कृत की तुलना।</p> <p>Origin and development of language, Classification of languages. Indo-European and Middle Indo-European and Middle Languages, Semantics, Phonology, Phonetic changes, Human वाक्य with special reference to Sanskrit phonology, comparison of Vedic and Classical Sanskrit languages.</p> <p>खण्ड-ख संस्कृत व्याकरण (Sanskrit Grammar)</p> <p>संज्ञा, समास, कृत्, तद्धित एवं कर्कश from the Laghusiddhanta: Kaumudi</p> <p>खण्ड-ग भारतीय दर्शन (Indian Philosophy)</p> <p>निम्नलिखित पाठ्यग्रन्थों के आधार पर भारतीय दर्शन का सामान्य अध्ययन: General study of Indian Philosophy based on the following texts. केचर मित्र का तर्कशास्त्र (आनन्दनन्दन) ईश्वरकृष्ण का सांख्यकारिका, सदानन्द का वेदान्त, कोपलेश्वर अय्यर द्वितीय स्तम्भ। श्रीमद्भागवतगीता द्वितीय अध्याय मात्र।</p> <p>खण्ड - घ - काव्यशास्त्र</p> <p>(क) आनन्दनन्दन कृत ध्वन्यलोक प्रथम उद्योत के आधार पर ध्वनि और उसके भेदों का सामान्य अध्ययन ध्वन्यलोक (प्रथम उद्योत) आनन्दनन्दन (ख) मम्मट के काव्यप्रकाश से निम्नलिखित विषय: The following topic from the काव्य प्रकाश आक मम्मट: काव्यकथन, काव्यरसज्ञ, काव्यभेद, शब्दार्थ, रस, गुरु तथा अनुप्रास स्रोत, उपमा, व्यंग्य, प्रशंसा, अपह्नुति, व्यतिरेक, अर्थान्तरस्था, विभावना, विशेषोक्ति, सम्भावोक्ति, समसोक्ति, दोषक, कव्यलिङ्ग, एवं परिचयका अलंकार।</p> <p>खण्ड - ङ - संस्कृत में निबन्ध (Essay in Sanskrit)</p> <p>संस्कृत में निबन्ध (250 शब्दों से कम का नहीं होना चाहिए) The Essay in sanskrit should not be less than 250 words.</p> <p>PAPER-II खण्ड - क गद्य एवं पद्य (Prose & Poetry)</p> <p>First hand reading of the following texts. निम्नलिखित पाठ्य ग्रन्थों का अध्ययन: 1. कालचर-सुशुक्लासिद्धेय मन्त्र 2. सितरत्नविजय-प्रथम नि: श्रास सर्ग 3. नारदचर-प्रथम अध्याय, आर्यवर्तनर्णन (28 स्तोकपर्यन्त) 4. मेघदूत (पूर्वोक्त) 5. किरातपर्वनीय (प्रथम सर्ग) 6. नीतिशतकम् चौथम् (संस्करण पृष्ठ 1 से 30 तक)। 25 अंकों के एक प्रश्न का उत्तर संस्कृत में लिखना होगा।</p> <p>खण्ड - ख संस्कृत नाट्य साहित्य (Sanskrit Drama)</p> <p>निम्नलिखित रचनाओं की पाठ्यसामग्री का अध्ययन: Textual study of the following works: 1. अश्विनाशकान्तलम् (चतुर्थ अंक), 2. उत्तरामचरितम् (तृतीय अंक), 3. प्रथिमानाटकम् (प्रथम अंक), 4. मुद्ररङ्गिका (प्रथम अंक)।</p> <p>खण्ड - घ - पारिभाषिक पद Technical Terms</p> <p>संस्कृत के निम्नलिखित पारिभाषिक शब्दों का ज्ञान: Knowledge of the following Sanskrit technical terms: महाकाव्य, खण्डकाव्य, कथा, आख्यायिका, धर्म, प्रस्तावना, विक्रमचक्र, प्रवेशक, सूत्रावर, रसपद, नायक भेद, विद्वत्, गेयम्, छिंद, पद, पाताकरसूत्र, अर्थव्यक्ति, कार्यवशा, पंचसन्धि, निवृत्त श्राव्य, स्वागत, जननिक, आकाशभाषि, रसपद, नेपथ्य, प्रवेशक, मतारवर्ग।</p> <p>खण्ड - च - संस्कृत साहित्य का इतिहास (History of Classical Sanskrit)</p> <p>Literature. निम्नलिखित साहित्यिक विषयों का उद्भव, विकास और उनकी विशेषताएँ: (Origin, Development and characteristics of the following Literary genres) आर्यनाटक, महाकाव्य (ऐतिहासिक महाकाव्य सहित) गद्य, नाटक, धर्म एवं गीतिकाव्य।</p> <p>टिप्पणी: इस खण्ड में 25 अंकों का एक प्रश्न लिखित। रचना चरनकार के विषय में टिप्पणी के रूप में प्रत्यक्ष होगा। Note: In this section one question carrying 25 marks will be asked in the form of short note on particular work/author.</p> <p>खण्ड-ङ- हिन्दी से संस्कृत अनुवाद Section - E - Translation from Hindi into Sanskrit</p>	<p>capital Market. Functions and working of all India term financial institution (IDBI, IFCI, ICICI, and IRBI). Investment Policies of the Life Insurance Corporation of India and the Unit Trust of India. Present stage of stock exchanges and their regulation.</p> <p>Provisions of the Negotiable Instruments Act. 1881 relating to crossing and endorsements with particular reference to stakholder, protection to the paying and collecting bankers. Salient provision and the banking Regulation Act, 1949 with regard to chartering, supply of coin and regulation of banks.</p> <p>Part - II : Organisation Theory and Industrial Relations : PART - I : ORGANISATION THEORY</p> <p>Nature and concepts of organisation, Organisation goals; primary and secondary goals, single and multiple goals, endsmeans chain. Displacement, succession, expansion and multiplication of goals. Formal organisation: type structure: fine and staff, Functional matrix and project, informal organisation: functions and limitations. Evolution of organisation theory.; classical, Neo-classical and system approach, Bureaucracy Nature and basis of power, source of power, power structure and politics, Morale and productivity, leadership. Theories and styles management of conflicts in organisation, transactional analysis, significance of culture to organisation. Limits of organisation. Organisational change, adaptations, growth and development, organisational control and effectiveness. Public accountability of organisations.</p> <p>PART - II : INDUSTRIAL RELATIONS</p> <p>Industrial labour in India and its commitment, Absentism and labour Turnover in Indian Industries. Nature and scope of Industrial Relations. Workers education, Workers participation in Management: philosophy, Rational, Present day stage of affairs, and its future prospects, Industrial Relations in Public Enterprises. Role of Personnel Department in an organisation, Executive development personnel policies) Personnel audit and personnel research, Wage and wage differentials, Wage policy in India, Legislative measures for wage administration in India, wages in India, industry and agriculture.</p> <p>Theories of Unionism, Trade Union Movement in India: Growth and Structure. Role of outside leadership. Collective bargaining: Approaches, Conditions limitations and its effectiveness in India. International Labour organisation and India. Prevention and settlement of industrial disputes in India. Settlement machinery, preventive measures and other measures in practice.</p> <p>32. PUBLIC ADMINISTRATION : Paper-1 Administrative Theory</p> <p>I. Basic Permisses : Meaning, Scope and significance of Public Administration: Evolution of Public Administration as discipline, Private and Public Administration: Public Administrations as an art and a science: its role in developed and developing societies; Ecology of administration- Social political, economic and culture New public Administration II. Theories of Organisation : Scientific management (Taylor and Lather); Bureaucratic theory (Max Weber); Classical theory (Henri Fayol, Luther Gulick and others); Human Relations theory (Elton Mayo and Lir colleagues); Systems approach (Chester Barnard). III. Principles of Organisation : Hierarchy; Unity of Command; Power Authority and Responsibility, Coordination; Span of Control; Supervision Centralisation and Decentralisation, Delegation IV. Administrative Behaviour : Decision Making with special reference to the contribution of Herbert Simon, Theories of Communication, Morale, Motivation (Maslow and Herzberg), and Leadership. V. Structure of Organisation : Chief Executive and his/her functions Line Staff and auxiliary agencies. Departments Corporation companies, Boards and Commissions, Headquarters and held relationship. VI. Personnel Administration : Bureaucracy and Civil Services, Classification, Recruitment Training, Career development, Performance appraisal, Promotion; Pay structuring: Service conditions; Integrity and Discipline, Employer-employee relations; Retirement benefits: Generalists and Specialists; Neutrality and Anonymity. VII. Financial Administration : Concepts of Budget; Preparation and execution of the Budget; performance Budgeting; Legislative control; Accounts and Audit. VIII. Accountability and Control : Concepts of Accountability and Control; Accounts and Audit. IX. Administrative Reforms : Concepts and processes of Administrative Reforms; O & M; Work study and its techniques; Problems and prospects. X. Administrative Law : Concepts and significance of Administrative Law, Delegation; Meaning, type advantage, limitations and safeguards Administrative Tribunals. XI. Comparative and Development Administration : Meaning, nature and scope of Comparative Public Administration: Contribution of Fred Riggs with special reference to the Prismatic-Sala model; Concepts scope and significance of Development Administration, Political, Economic and socio- cultural context of Development Administration; Concepts of Administrative Development. XII. Public policy : Concept and significance of Policy and policy-making in public Administration Processes of formulation and implementation.</p> <p>PAPER - II : INDIAN ADMINISTRATION</p> <p>I. Evolution of Indian Administration : Kautliya's views, Major landmarks of Mughal and British periods. II. Constitutional Setting : Parliamentary democracy : Federalism; Planning Socialism. III. Political Systems : Bureaucracy and Civil Services, Council of Ministers; Council of Ministers; Cabinet Committees. IV. Structure of Control Administration : Secretariat; Cabinet Secretariat Ministries and Departments Boards and Commissions, Field organisations. V. Central- State Relations : Legislative Administrative Planning and Financial. VI. Public Service : All India Central and State Services, Union and State Public Service Commissions: Training of Civil Servants. VII. Machinery for Planning : Plan formulation at the national level; National Development Council. Planning Commission. Planning Machinery at the State and District levels. VIII. Public Sector Undertakings : Forms, Top- level Management. Control and problems. IX. Control of Public Expenditure : Parliamentary control; Role of the Finance Ministry, Controller and Auditor General. X. Administration of Law and Order : Role of Central and State agencies in Maintenance of law and Order. XI. State Administration : Governor Chief Minister, Council of Ministers, Chief Secretary; Secretariat; Directorates. XII. District Administration : Role and importance. District Magistrate/ Collector, Land Revenue. Law and Order and Developmental functions, District Rural Development Agency, Special Programmes of Rural Areas. XIII. Local Administration : Panchayati Raj and Urban Local Government. Features, forms and problems Autonomy of local bodies. XIV. Administration of Welfare : Administration for the welfare of weaker sections with particular reference to Scheduled Castes, Scheduled Tribes; Programmes for the welfare of Women. XV. Issue Areas in Indian Administration. Relationship between political and permanent institutions. Generalists and specialists in Administration Integrity in Administration - People's Participation in Administration, Redressal of Citizen's Grievances; Lok Pal and Lok Ayuktas; Administrative Reforms in India.</p> <p>33. AGRICULTURAL ENGINEERING : PAPER - 1</p> <p>(a) Fluid Mechanics : Fluid properties, units and dimensions, mass, momentum and energy conservation principles: special cases of Navier-stoke equation, vorticity, flow of fluids in pipes and channels, frictions factors: turbulence; instruments and measurement systems. (b) Heat and Mass Transfer : Thermal properties of materials units and dimensions steady state and transient heat conduction natural and forced convection; boiling, condensation, thermal radiation exchange; heat exchangers, heat- mass transfer analogy: fick's laws, psychrometrics; analysis of heat and mass transfer processes: instruments and measurements systems. (c) Surveying, Levelling and land Development : Linear measurements; different surveying devices and methods land grading and levelling; contouring and terracing earth work estimation, land and development budgeting earthmoving machinery (d) Pumps : Design, construction, performance characterization, selection, installation, Servicing and maintenance of reciprocating, centrifugal, gear, turbine, submersible, propeller, jet and lift pumps and hydraulic ram; renewable and non renewable power sources for pumps. (e) Process and food Engineering : Unit operation in post-harvest processing (cleaning, grading, drying, size reduction, evaporation, pasteurization, distillation): processing of food grains, animal feed, seeds, fruits & vegetables, flowers, spices, dairy products, eggs and meat, design of processing equipment and machinery. (f) Storage and Handling Engineering : Changes in stored products during storage; storage of food grains & their products, feed fruits and vegetables, flowers, spices, dairy products, eggs and meat, air right ventilated, refrigerated, modified atmosphere and controlled atmosphere storage systems; packaging, conveyors; design and management of storage and handling systems. (g) Rural Engineering : Building materials and their properties. design of beams, slabs, columns and foundations) fencing: planning and design of rural houses, farm roads, village drainage systems waste disposal and sanitary structures, material and cost estimation in construction; integrated rural energy planning and development: rural electrification.</p> <p>PAPER - II</p> <p>(a) Thermodynamic and Heat Engines : Concept of energy temperature and heat Equation of State Laws of thermodynamics; pure substances and properties; entropy, boilers; boiler efficiency steam, engine and turbines; rankine, air standed otto, diesel and joule cycles, indicator diagrams; I.C. Engines (b) Farm Power : Sources of power on farm; farm power and agricultural productivity relationship; comparison of tractor/engine power with animal power, operation and constructional features of I.C. engines, various systems present in I.C. engines viz. carburation, ignition cooling lubrication. Starting and electrical system, valves and valve timings; special features of diesel engines, tractors; their classification, power transmission, clutch, drawbar, three- point hitch, p.t.o belt and pulley; tractor controls; tractor chassis, stability, trouble shooting, repair and maintenance of tractors, tractor testing economics of tractor utilization, small tractors and power tillers; their economics and suitability (c) Farm Machinery : Design, construction, operation, repair and maintenance of primary and secondary tillage tools: implements and machines viz. m.b. plough, disc plough, hoe, harrow and cultivator; seeding, planting and transplanting machines, weeder s; sprayers and dusters; forage harvesters and mowers: harvesters, threshers, winnowers and combines, crop and soil factors affecting machine performance and energy requirements, economics of tractorization, combining and other mechanized operations; selection of farm machines. (d) Irrigation Engineering : Water resources of India; soil water plant relationship permeability infiltration; percolation; evaporation; water requirements of crops and irrigation scheduling, direct and indirect methods of soil moisture measurements; measurements of irrigation water, weirs and notches, orific, parshall flumes, H- flumes, etc water conveyance and control; design of fields channels and canals; lacey and kennedy's theories most economical challe cross section; design of underground pipe line structures and their design; irrigation methods- their hydraulics and selection viz., border furrow, flood drip & sprinkler methods; concepts in irrigation efficiencies. (e) Drainage Engineering : Benefits of drainage; hydraulic conductivity, drainable porosity, drainage coefficient; surface drainage: drainage of flat and sloping lands; design of open ditches, their alignment and construction; design and layouts of sub surface drains: depth and spacing of drains and drainage bed installation of drains and irrigation scheduling, direct and indirect methods of soil moisture measurements; measurements of precipitation: hydrologic scycle: point rainfall analysis, frequency analysis, watershed definition and concept agricultural watersheds, prediction of peak runoff; factors affecting run- off hydrograph, concept of unit and instantaneous hydrographs erosion control measures on various classes of lead viz contour cultivation, strip cropping, terracing afforestation, pastures, etc. a critical analysis of the role of vegetation in soil and water conservation; grassed waterway and its design; design of gully control measures including permanent structures, viz., chute spill way, drop spillway, drop inlet spillway; retards and steam bank erosion; flood routing; flood amelioration through soil and water management in upstream zone mechanics of wind and water erosion, wind erosion control.</p>
---	---