SYLLABUS FOR ENTRANCE EXAMINATION

1. Mathematics

Applications of matrices and Determinants

Adjoin, Inverse-Properties, Computation of inverses, solution of system of linear equations by matrix inversion method. Rank of a Matrix - Elementary transformation on a matrix, consistency of a system of linear equations, Cramer's rule, Non-homogeneous equations, homogeneous linear system, rank method.

Vector Algebra

Scalar Product–Angle between two vectors, properties of scalar product, applications of dot products. Vector Product - Right handed and left handed systems, properties of vector product, applications of crossproduct. Product of three vectors - Scalar triple product, properties of scalar triple product, vector triple product, vector product of four vectors, scalar product of four vectors. Lines - Equation of a straight line passing through a given point and parallel to a given vector, passing through two given points (derivations are not required). Angle between two lines. Skew lines - Shortest distance between two lines, condition for two lines to intersect, point of intersection, collinearity of three points. Planes - Equation of a plane (derivations are not required), passing through a given point and perpendicular to a vector, given the distance from the origin and unit normal, passing through a given point and parallel to two given vectors, passing through two given points and parallel to a given vector, passing through three given non-collinear points, passing through the line of intersection of two given planes, the distance between a point and a plane, the plane which contains two given lines, angle between two given planes, angle between a line and a plane. Sphere - Equation of the sphere (derivations are not required) whose centre and radius are given, equation of a sphere when the extremities of the diameter are given.

Complex Numbers

Complex number system, Conjugate - properties, ordered pair representation. Modulus - properties, geometrical representation, meaning, polar form, principal value, conjugate, sum, difference, product, quotient, vector interpretation, solutions of polynomial equations, De Moivre's theorem and its applications. Roots of a complex number - nth roots, cube roots, fourth roots.

Analytical geometry

Definition of a Conic - General equation of a conic, classification with respect to the general equation of a conic, classification of conics with respect to eccentricity. Parabola - Standard equation of a parabola (derivation and tracing the parabola are not required), other standard parabolas, the process of shifting the origin, general form of the standard equation, some practical problems. Ellipse - Standard equation of the ellipse (derivation and tracing the ellipse are not required), x2/a2 + y2/b2 = 1, (a > b), Other standard form of the ellipse, general forms, some practical problems, Hyperbola - standard equation (derivation and tracing the hyperbola are not required), x2/a2 - y2/ b2 = 1, Other form of the hyperbola, parametric form of conics, chords. Tangents and Normals - Cartesian form and Parametric form, equation of chord of contact of tangents from a point (x1, y1), Asymptotes, Rectangular hyperbola – standard equation of a rectangular hyperbola.

Differential Calculus – Applications I

Derivative as a rate measure - rate of change - velocity - acceleration - related rates - Derivative as a measure of slope - tangent, normal and angle between curves. Maxima and Minima. Mean value theorem - Rolle's Theorem - Lagrange Mean Value Thorem - Taylor's and Maclaurin's series, l' Hôpital's Rule, stationary points - increasing, decreasing, maxima, minima, concavity convexity, points of inflexion.

Differential Calculus – Applications II

Errors and approximations- absolute, relative, percentage errors, curve tracing, partial derivatives - Euler's theorem.

Integral Calculus & its Applications

Properties of definite integrals, reduction formulae for sinnx and cosnx (only results), Area, length, volume and surface area.

Differential Equations

Formation of differential equations, order and degree, solving differential equations (1st order) - variable separable homogeneous, linear equations. Second order linear equations with constant coefficients f(x) = emx, sin mx, cos mx, x, x2.

Discrete mathematics

Mathematical Logic - Logical statements, connectives, truth tables, Tautologies.

groups :

Binary Operations - Semi groups - monoids, groups (Problems and simple properties only), order of a group, order of an element.

Probability Distributions

Random Variable, Probability density function, distribution function, mathematical expectation, variance, Discrete Distributions - Binomial, Poisson, Continuous Distribution - Normal distribution.

2. Physics

Electrostatics

Frictional electricity, charges and their conservation; Coulomb's law – forces between two point electric charges. Forces between multiple electric charges – superposition principle. Electric field – Electric field due to a point charge, electric field lines; Electric dipole, electric field intensity due to a dipole – behavior of dipole in a uniform electric field – application of electric dipole in microwave oven. Electric potential – potential difference – electric potential due to a point charge and due a dipole. Equipotential surfaces – Electrical potential energy of a system of two point charges. Electric flux – Gauss's theorem and its applications to find field due to (1) infinitely long straight wire

(2) uniformly charged infinite plane sheet (3) two parallel sheets (4) uniformly charged thin spherical shell (inside and outside) Electrostatic induction – capacitor and capacitance – Dielectric and electric polarisation – parallel plate capacitor with and without dielectric medium–applications of capacitor – energy stored in a capacitor. Capacitors in series and in parallel – action of points – Lightning arrester – Van de Graaff generator.

Current Electricity

Electric current – flow of charges in a metallic conductor – Drift velocity and mobility and their relation with electric current. Ohm's law, electrical resistance. V-I characteristics – Electrical resistivity and conductivity. Classification of materials in terms of conductivity – Superconductivity (elementary ideas) – Carbon resistors – colour code for carbon resistors – Combination of resistors – series and parallel – Temperature dependence of resistance – Internal resistance of a cell – Potential difference and emf of a cell. Kirchoff's law – illustration by simple circuits – Wheatstone's Bridge and its application for temperature coefficient of resistance measurement – Metrebridge – Special case of Wheatstone bridge – Potentiometer – principle – comparing the emf of two cells. Electric power – Chemical effect of current – Electro chemical cells Primary (Voltaic, Lechlanche, Daniel)

– Secondary – rechargeable cell – lead acid accumulator.

Effects of Electric Current

Heating effect. Joule's law – Experimental verification. Thermoelectric effects – Seebeck effect – Peltier effect – Thomson effect – Thermocouple, thermo emf, neutral and inversion temperature. Thermopile. Magnetic effect of electric current – Concept of magnetic field, Oersted's experiment – Biot-Savart law – Magnetic field due to an infinitely long current carrying straight wire and circular coil – Tangent galvanometer – Construction and working – Bar magnet as an equivalent solenoid – magnetic field lines. Ampere's circuital law and its application. Force on a moving charge in uniform magnetic field and electric field – cyclotron – Force on current carrying conductor in a uniform magnetic field, forces between two parallel current carrying conductors – definition of ampere. Torque experienced by a current loop in a uniform magnetic field-moving coil galvanometer – Conversion to ammeter and voltmeter – Current loop as a magnetic dipole and its magnetic dipole moment – Magnetic dipole moment of a revolving electron.

Electromagnetic Induction and Alternating Current

Electromagnetic induction – Faraday's law – induced emf and current – Lenz's law. Self induction – Mutual induction – Self inductance of a long solenoid – mutual inductance of two long solenoids. Methods of inducing emf – (1) by changing magnetic induction (2) by changing area enclosed by the coil (3) by changing the orientation of the coil (quantitative treatment) analytical treatment can also be included. AC generator – commercial generator. (Single phase, three phase). Eddy current – Applications – Transformer – Long distance transmission. Alternating current–measurement of AC – AC circuit with resistance – AC circuit with inductor – AC circuit with capacitor – LCR series circuit – Resonance and Q – factor: power in AC circuits.

Electromagnetic Waves and Wave Optics

Electromagnetic waves and their characteristics – Electromagnetic spectrum, Radio, microwaves, Infra red, visible, ultra violet – X rays, gamma rays. Emission and Absorption spectrum – Line, Band and continuous spectra – Flourescence and phosphorescence. Theories of light – Corpuscular – Wave – Electromagnetic and Quantum theories. Scattering of light – Rayleigh's scattering – Tyndal scattering – Raman effect – Raman spectrum – Blue colour of the sky and reddish appearance of the sun at sunrise and sunset. Wavefront and Huygen's principle – Reflection, Total internal reflection and refraction of plane wave at a plane surface using wavefronts. Interference – Young's double slit experiment and expression for fringe width – coherent source – interference of light. Formation of colours in thin films – analytical treatment – Newton's rings. Diffraction – differences between interference and diffraction of light – diffraction grating. Polarisation of light waves – polarisation by reflection – Brewster's law-double refraction – nicol prism – uses of plane polarised light and polaroids – rotatory polarisation – polarimeter.

Atomic Physics

Atomic structure – discovery of the electron – specific charge (Thomson's method) and charge of the electron (Millikan's oil drop method) – alpha scattering – Rutherford's atom model. Bohr's model – energy quantisation – energy and wave number expression – Hydrogen spectrum – energy level diagrams – sodium and mercury spectra-excitation

and ionization potentials. Sommerfeld's atom model. X-rays–production, properties, detection, absorption, diffraction of X-rays – Laue's experiment – Bragg's law, Bragg's X-ray spectrometer – X-ray spectra – continuous and characteristic X-ray spectrum – Mosley's law and atomic number. Masers and Lasers – spontaneous and stimulated emission – normal population and population inversion – Ruby laser, He – Ne laser – properties and applications of laser light – holography.

Dual Nature of Radiation And matter–relativity

Photoelectric effect – Light waves and photons – Einstein's photo – electric equation – laws of photo – electric emission – particle nature of energy – photoelectric equation – work function – photo cells and their application. Matter waves – wave mechanical concept of the atom – wave nature of particles – De – Broglie relation – De – Broglie wave length of an electron – electron microscope. Concept of space, mass, time – Frame of references. Special theory of relativity – Relativity of length, time and mass with velocity – ($E = mc^2$).

Nuclear Physics

Nuclear properties–nuclear Radii, masses, binding energy, density, charge – isotopes, isobars and isotones – Nuclear mass defect – binding energy. Stability of nuclei-Bain bridge mass spectrometer. Nature of nuclear forces – Neutron – discovery – properties – artificial transmutation – particle accelerator Radioactivity – alpha, beta and gamma radiations and their properties, -decay, -decay and-decay – Radioactive decay law – half life – mean life. Artificial radioactivity – radio isotopes – effects and uses Geiger – Muller counter. Radio carbon dating – biological radiation hazards .Nuclear fission – chain reaction – atom bomb – nuclear reactor – nuclear fusion – Hydrogen bomb – cosmic rays – elementary particles.

Semiconductor Devices and their Applications

Semiconductor theory – energy band in solids – difference between metals, insulators and semiconductors based on band theory – semiconductor doping – Intrinsic and Extrinsic semi conductors. Formation of P-N Junction – Barrier potential and depletion layer. – P-N Junction diode – Forward and reverse bias characteristics – diode as a rectifier – zener diode. Zener diode as a voltage regulator – LED. Junction transistors – characteristics – transistor as a switch – transistor as an amplifier – transistor biasing – RC, LC coupled and direct coupling in amplifier – feeback amplifier – positive and negative feedback – advantages of negative feedback amplifier – oscillator – condition for oscillations – LC circuit – Colpitt oscillator. Logic gates – NOT, OR, AND, EXOR using discret components – NAND and NOR gates as universal gates – integrated circuits. Laws and theorems of Boolean's algebra – operational amplifier – parameters – pin-out configuration – Basic applications. Inverting amplifier. Non-inverting amplifier – summing and difference amplifiers. Measuring Instruments – Cathode Ray oscillocope – Principle – Functional units – uses. Multimeter – construction and uses.

Communication Systems

Modes of propagation, ground wave – sky wave propagation. Amplitude modulation, merits and demerits – applications – frequency modulation – advantages and applications – phase modulation. Antennas and directivity. Radio transmission and reception – AM and FM – superheterodyne receiver. T.V. transmission and reception–scanning and synchronising. Vidicon (camera tube) and picture tube – block diagram of a monochrome TV transmitter and receiver circuits. Radar – principle – applications. Digital communication – data transmission and reception – principles of fax, modem, satellite communication – wire, cable and Fibre-optical communication.

3. Chemistry

Inorganic Chemistry

Atomic Structure

Dual properties of electrons-de-Broglie relation – Heisenberg's uncertainty principle – Wave nature of an electron – Schrodinger wave equation (only equation, no derivation) – Eigen values and Eigen function – significance only – molecular orbital method. Application to Homo diatomic and Hetero diatomic molecules-Metallic Bond – Hybridization of atomic orbitals .Hybridization involving, p and d Orbitals – Types of forces between molecules.

Periodic Classification

Review of periodic properties – Calculation of atomic radii – Calculation of ionic radii-Method of determination of Ionisation potential-Factors affecting ionisation potential – Method to determine the electron affinity – Factors affecting EA-Various scales on electro negativity values.

P – Block Elements

Group – 13 General trends-Potash alum – Preparation, Properties and uses – Group 14 General trends – Silicates – Types and structure – Silicones-Structure and uses – Extraction of lead – Group – 15 General trends – Phosphorous-Allotropes and extraction – Compounds of phosphorous – Group – 16 General trends – H_2SO_4 – Manufacture and properties. – Group – 17 General characteristics. Physical and Chemical properties – Isolation

of fluorine and its properties – Interhalogen compounds Group – 18 Inert gases – Isolation, properties and uses.

D – Block Elements

General characteristics of D-block elements – First transition series –Occurrence and principles of extraction – chromium, copper and zinc – Alloys – Second transition series – Occurrence and principles of extraction of silver – Third transition series – Compounds – $K_2Cr_2O_7$, $CuSO_45H_2O$, $AgNO_3$, $Hg2Cl_2$, $ZnCO_3$, Purple of cassius.

F – Block Elements

General characteristics of F-block elements and extraction – Comparison of Lanthanides and Actinides – Uses of lanthanides and actinides.

Coordination Compounds and Bio-Coordination Compounds

An introduction – Terminology in coordination chemistry – IUPAC nomenclature of mononuclear coordination compounds – Isomerism in coordination compounds – Structural isomerism – Geometrical isomerism in 4 – coordinate, 6 – coordinate complexes – Theories on coordination compounds – Werner's theory (brief) – Valence Bond theory – Crystal field theory – Uses of coordination compounds – Biocoordination compounds. Haemoglobin and chlorophyll.

Nuclear Chemistry

Nuclear energy nuclear fission and fusion – Radio carbon dating – Nuclear reaction in sun-Uses of radioactive isotopes.

Physical Chemistry

Solid State –II

Types of packing in crystals-X-Ray crystal structure – Types of ionic crystals – Imperfections in solids – Properties of crystalline solids–Amorphous solid.

Thermodynamics – II

I law of thermodynamics – Need for the II law of thermodynamics – Spontaneous and non-spontaneous processes – Entropy – Gibb's free energy – Free energy change and chemical equilibrium – Third law of thermodynamics.

Chemical Eequilibrium – II

Applications of law of mass action – Le Chatlier's principle.

Chemical Kinetics-II

First order reaction and pseudo first order reaction – Experimental determination of first order reaction-method of determining order of reaction – temperature dependence of rate constant – Simple and complex reactions.

Surface Chemistry

Adsorption-Catalysis-Theory of catalysis-Colloids-Preparation of colloids-Properties of colloids-Emulsions.

Electrochemistry

Conductors, insulators and semi conductors – Theory of electrical conductance – Theory of strong electrolytes – Faraday's laws of electrolysis – Specific resistance, specific conductance, equivalent and molar conductance – Variation of conductance with dilution – Kohlraush's law – Ionic product of water, pH and pOH – Buffer solutions – Use of pH values.

Cells-Electrodes and electrode potentials-Construction of cell and EMF – Corrosion and its preventions-commercial production of chemicals-Fuel cells.

Organic Chemistry

Isomerism In Organic Chemistry

Geometrical isomerism – Conformations of cyclic compounds – Optical isomerism – Optical activity – Chirality – Compounds containing chiral centres-D-L and R-S notation – Isomerism in benzene.

Hydroxy Derivatives

Nomenclature of alcohols – Classification of alcohols – General methods of preparation of primary alcohols – Properties Methods of distinction between three classes of alcohols 1°, 2° and 3°) – Methods of preparation of dihydric alcohols. (glycol) – Properties – Uses – Methods of preparation of trihydric alcohols – Properties – Uses – Aromatic alcohols – Methods of preparation of benzyl alcohol – Properties – Uses – Phenols – Manufacture of phenols – Properties – Chemical properties – Uses of Phenols.

Ethers

Ethers-General methods of preparation of aliphatic ethers – Properties – Uses – Aromatic ethers – Preparation of anisole – Reactions of anisole – Uses.

Carbonyl Compounds

Nomenclature of carbonyl compounds – Comparison of aldehydes and ketones – General methods of preparation of aldehydes – Properties – Uses Aromatic aldehydes

– Preparation of benzaldehyde – Properties – Uses – Ketones – general methods of preparation of aliphatic ketones (acetone) – Properties – Uses – Aromatic ketones – preparation of acetophenone – Properties – Uses – preparation of benzo – phenone – Properties.

Carboxylic Acids

Nomenclature – Preparation of aliphatic monocarboxylic acids – formic acid – Properties – Uses – Tests for carboxylic acid – Monohydroxy mono carboxylic acids – Lactic acid – Sources – Synthesis of lactic acid – Aliphatic dicarboxylic acids – preparation of dicarboxylic acids – oxalic and succinic acids – Properties – Strengths of carboxylic acids – Aromatic acids – Preparation of benzoic acid – Properties – Uses – Preparation of salicylic acid – Properties – Uses – Derivatives of carboxylic acids – Preparation of acid chloride – acetyl chloride (CH_3COCl) – Preparation – Properties – Uses – Preparation of acetamide – Properties – Preparation of acetic anhydride – Properties – Preparation of esters methyl acetate – Properties.

Organic Nitrogen Compounds

Aliphatic nitro compounds – Preparation of aliphatic nitroalkanes – Properties – Uses – Aromatic nitro compounds – Preparation – Properties – Uses – Distinction between aliphatic and aromatic nitro compounds – Amines – Aliphatic amines – General methods of preparation – Properties – Distinction between 1°, 2°, and 3° amines – Aromatic amines – Synthesis of benzylamine – Properties – Aniline – preparation – Properties – Uses – Distinction between aliphatic and aromatic amines – Aliphatic nitriles – Preparation – properties – Uses – Diazonium salts – Preparation of benzene diazoniumchloride – Properties.

Biomolecules

Carbohydrates – structural elucidation – Disaccharides and polysaccharides – Proteins-Amino acids – structure of proteins – Nucleic acids – Lipids.

Chemistry in Action

Medicinal chemistry – Drug abuse – Dyes – classification and uses – Cosmetics – creams, perfumes, talcum powder and deodorants – chemicals in food – Preservatives artificial sweetening agents, antioxidants and edible colours – Insect repellant – pheromones and sex attractants – Rocket fuels – Types of polymers, preparation and uses.

4. BIOLOGY

Taxonomy of Angiosperms

Dual properties of electrons-de-Broglie relation – Heisenberg's uncertainty principle – Wave nature of an electron – Schrodinger wave equation (only equation, no derivation) – Eigen values and Eigen function – significance only – molecular orbital method. Application to Homo diatomic and Hetero diatomic molecules-Metallic Bond – Hybridization of atomic orbitals .Hybridization involving, p and d Orbitals – Types of forces between molecules.

Plant anatomy

Tissue and tissue systems - anatomy of monocot and dicot roots - anatomy of monocot and dicot stems - anatomy of dicot leaf.

Cell biology and genetics

Chromosomes - structure and types - genes and genomes – linkage and crossing over - gene mapping - recombination of chromosomes - mutation - chromosomal aberrations - DNA as genetic material – structure of DNA - replication of DNA - structure of RNA and its types.

Biotechnology

Recombinant DNA technology - transgenic plants and microbes - plant tissue culture and its application - protoplasmic fusion - single cell protein.

Plant physiology

Photosynthesis – significance – site of photosynthesis – photochemical and biosynthetic phases – electron transport system – cyclic and non-cyclic photophosphorylation – C3 and C4 pathways – photorespiration – factors affecting photosynthesis – mode of nutrition – autotrophic – heterotrophic – saprophytic – parasitic and insectivorous plants – chemosynthesis – respiration – mechanism of glycolysis – Krebs cycle – pentose phosphate pathway – anaerobic respiration – respiratory quotient – compensation point – fermentation. Plant growth – growth regulators – phytohormones – auxins – gibberellins – cytokinins – ethylene and abscisic acid. Photoperiodism and vernalization.

Biology in human welfare

Food production – breeding experiments – improved varieties and role of biofertilizers. Crop diseases and their control – biopesticides – genetically modified food – biowar – biopiracy – biopatent – sustained agriculture and medicinal plants including microbes. Economic importance – food yielding (rice) – oil yielding (groundnut) – fibre yielding and timber yielding plants.

Human physiology

Nutrition : Introduction - Carbohydrates - Proteins - Lipids - Vitamins - Minerals - Water - Balanced diet - Calorie values (ICMR standards) - Obesity - Hyperglycemia - hypoglycemia - Malnutritions. Digestion: Enzymes and enzyme action - Brief account of following - Dental

caries - Root canal therapy - Peptic ulcer - Hernia - Appendicitis - Gall bladder stone - Liver cirrhosis - Hepatitis. Bones and Joints: Fractures - Dislocations - Arthritis – Rickets and osteomalacia - Orthopaedics - Gout.

Muscles : Muscle action - Muscle tone - Rigor mortis - Muscle pull (hernia) -Isometric and aerobic exercises (Body building) - Myasthenia gravis. Respiration : Process of pulmonary respiration - Inspiration - Expiration – Exchange of gases at alveolar level - Control of respiration - Pneumonia – Pleurisy - Tuberculosis - Bronchitis - Breathing exercises

Circulation-Functioning of heart-Origin and conduction of heart beat.

Artificial pacemaker-Coronary blood vessel and its significance-Myocardial infarction,Angina pectoris-Angiogram,angioplasty and coronary bipass surgery-Atherosclerosis-Heart attack-Heart block-ECG and Echo cardiograph-Heart valves Rheumatic Heart Disease (RHD)-ICCUArterial and venous systems-Blood pressure-pulse rate-Heart transplantation Resuscitation in Heart attack (First Aid)-Blood components Function-Plasma-Corpuscles -Blood clotting-Anticoagulants-Thrombosis-

Embolism-blood related diseases like polycythemia Leukemia-Lymph fluid. Physiological-Co-ordination Systems-Brain-Functioning of different regions-Memory-Sleep-Stroke-Alzhemier's disease-Meningitis/Brain fever Conditioned reflex-Electroencephalography-Right brain-left brain concept-Spinal cord- Functioning-Reflex action-CSF-Chemical co-ordination-Pituitary -Thyroid, Parathyroidal hormones-Insulin and Glucagon-Hormones of Adrenal cortex and Medulla-Reproductive Hormones-Problems related to Secretion Non secretion of Hormones.

Receptor Organs-Eye-Focussing Mechanism & photo chemistry of retina-Short sightedness-Longsightedness-Optometry-Retinopathy-Cataract-Lens replacement-Nyctalopia-Eye infection-Conjunctivitis-Glaucuoma-Eye care-EAR-Hearing mechanism- Organ of corti-Hearing impairments and aids-Noise pollution and its importance-Skin-Melanin-functions-Effect of solar radiations/UV-Skin Grafting- Dematitis-TONGUE-Gustatory reception.

Excretion-Ureotelism-Urea Biosynthesis(Ornithine Cycle)-Nephron ultrafiltration,tubular reabsorption and tubular secretion-Renal failure-Dialysis Kidney stone formation-Kidney Transplantation-Diabetes. Reproductive system-Brief account of speramtogenesis - Oogenesis Menstrual cycle-Invitro fertilization-Birthcontrol.

microbiology

Introduction-History of Medical Microbiology-The influence of Pasteur Koch, and Lister-Virology, Structure, Genetics, Culture and diseases-AIDS and its control-Bacteriology-Structure, Genetics and diseases-Protozoan microbiology- Disease oriented-Pathogenecity of Micro organism-Anti microbial resistance Chemotherapy.

Immunology

Innate Immunity-Anatomical Barriers-Physiological Barriers-Phagocytic Barriers-Lymphoidal organs -Thymus-Bursa of Fabricius-Peripheral Lymphoid Organs-Lymph nodes-Spleen-Antibodies-Immunoglobulins-Regions of polypepetide chain-Transplantation immunology-Classification of grafts- Genetic basis of organ transplants-Immune system disorder.

modern genetics

Introduction-Scope-Human Genetics karyotyping Chromosome gene mapping, Recombinant DNA technology and segmenting. Genetic diseases-Human Genome project-Cloning-Transgenic organisms Genetically Modified Organisms (GMO)-Genetherapy-Bio informatics application-DNA sequencing and protein structure. Biological database.

Environmental science

Human population and explosion-Issue-Global warming Crisis Green House Effect-Ozone layer depletion Waste management - Biodiversity conservation (Biosphere reserves) Government and Non Governmental organizations involved-Energy crisis and Environmental impact-Poverty and environment-Fresh water crisis and management.

Applied biology

Livestock and Management-Dairy-Breeds of cattle-Milch breed- Draught breed-Dual purpose-Common diseases and control-Exotic and cross breeds-Techniques adopted in cattle breeding.

Poultry-Farming techniques-Breeds. Farming methods - Poultry diseases-Economic value. Pisciculture - Fish farming-Edible fishes of Tamilnadu. Medical Lab Techniques - Stethoscope-Sphygmomanometer-Heamocytometer-Urine- Sugar analysis-ECG-'PQRST'wave-CTScan-Endoscopic techniques- Artificial pacemaker-Auto analyser.

Theories of evolution

Lamarckism - Neo - Lamarckism - Darwinism - Neo - Darwinism / Modern concept of natural selection-Species concept-Origin of species and Isolating Mechanisms.