

PHYSICS

Test No. Unit Covered/Topic Covered

01 Unit-1: BASIC MATHEMATICS USED IN PHYSICS

ALGEBRA : Quadratic Equation (Roots of quadratic equation, Solution by Factorization and by Shridharacharya Formula, Properties of roots (real, equal, imaginary etc), Application of Quadratic equation in physics), Binomial Theorem and binomial approximation, Logarithm and Exponents (Laws of logarithms and exponents with applications / examples), Series (Arithmetic Progression and its general term and Sum, Sum of first n Natural numbers, Geometrical Progression and its general term and Sum, Sum of infinite GP), Componendo & Dividendo rule.

TRIGONOMETRY : Angle & its measurement (Sexagesimal and Circular system), Trigonometric ratios, Trigonometric identities, Four Quadrants & ASTC rule, T-ratios for general angles, Addition/subtraction Formulae, Small angle Approximation, Ranges of T-functions.

CO-ORDINATE GEOMETRY : Define Origin, Axis or Axes, Co-ordinates of a point in a plane or space (2D or 3D), Distance Formula, Slope of a line and its interpretation, Graphs of commonly used functions (Straight line, Parabola, Circle, Ellipse, Hyperbola Including rectangular hyperbola, Sinusoidal functions (sine and cosine functions), Exponential functions.

CALCULUS : Differential calculus (Average rate of change and Instantaneous rate of change, Differentiation of commonly used functions, Rules of differentiation including Product and Quotient rules, Application of derivatives: Increasing and Decreasing nature, Maxima and Minima with geometrical/graphical explanation), Integral calculus (Integration is the reverse process of differentiation, Indefinite and Definite Integration, Integration of commonly used functions, Rules of Integration, Application of Integral calculus: Area under a curve and Average value of a continuous function in an interval).

VECTORS : Definition of scalar and vector quantities, Graphical representation of vectors, Notation of Vectors, Angle between two vectors, Types of Vectors (Unit vector, Null vector, Equal vectors and equality of vectors, opposite and Negative of a vector, Parallel and anti-parallel vectors, Co-planar vectors, axial vectors), Position and displacement vectors, Addition/subtraction of two vectors (Triangle law, Parallelogram law), Addition of many vectors (Polygon law), Unit vectors and their significance (Representation of vector in terms of unit vector in plane and in space), Resolution of a Vector into components i.e. Cartesian Components in two and three dimensions and Direction Cosines, Multiplication or Division of a Vector by a Scalar (i.e. Real number), Scalar (Dot) product of two Vectors and component of a vector in the direction of another vector, Vector (Cross) product of two Vectors with its geometrical interpretation and Right hand rule for direction.

UNIT, DIMENSIONS AND MEASUREMENTS

Classification of Physical Quantities according to their dependency i.e. Fundamental (or Base) and Derived quantities, Need for measurement (Units of measurement), Systems of units (FPS, CGS, MKS, SI system of units and Supplementary units, fundamental and derived units, Some idea about Practical and Improper units), Standards of Length, mass and time measurements, Dimensions of physical quantities, Dimensional Formulae of important physical quantities, Dimensional analysis and its applications & its limitations, SI prefixes and general guidelines for using Symbols of SI units, Errors in measurement (Systematic, Random and Least count Errors), Accuracy and precision of measuring instruments; Absolute Error, Relative Error, Percentage Error and Combination of Errors, Significant figures and its rules for Arithmetic operations (i.e. addition, subtraction, multiplication and division), Rounding off the uncertain digits.

02 Unit-2: KINEMATICS

(Motion along a straight line and Motion in a Plane)

Motion and Rest with introduction of frame of reference , Variables of Translatory Motion (Position/ Displacement / Path length(Distance) , Velocity/ Speed / Average Velocity / Average Speed, Acceleration / Average Acceleration) , Relation among various variables of motion and their applications to variable acceleration , Equations of Motion with constant acceleration (scalar and vector forms), Motion along a straight line, velocity-time and position-time graphs for uniformly accelerated motion (graphical treatment) , Motion under gravity, Free-fall , Motion in a plane with constant acceleration , Projectile Motion – Ground to Ground projection, Projection from a height (Horizontal projection) , Relative Motion in one-dimensions , Relative Velocity in two dimensions (Rain-Man problem, River-Boat Problem & wind based questions)

03 Review Test - 1 : Syllabus of Test No. 1 & 2**04 Unit-3: LAWS OF MOTION AND FRICTION**

Intuitive concept of force , Basic or Fundamental forces in nature , The law of Inertia, Newton's first law of motion ,Momentum and Newton's second law of motion; impulse , Newton's third law of motion , Common forces in mechanics-Weight, Normal reaction, Friction, Contact force, Tension in string , Free Body diagram, Equilibrium of concurrent forces-Lami's theorem, Motion of bodies in contact or connected by strings, Pulley systems , Frame of Reference-Inertial and Non Inertial Frames. Pseudo Force and its applications , Cause of Friction, Static and Kinetic friction , Laws of friction, Limiting Static and Kinetic friction coefficients, Angle of Friction, Angle of Repose , Rolling friction, Lubrication.

05 Unit-4: WORK, ENERGY, POWER

Work done by a constant force (use of dot product) and variable force(use of definite integration i.e. area under the curve) , Kinetic energy , Work-energy theorem for a Constant and a Variable force,

Concept of potential energy, conservative forces and non-conservative forces. Gravitational Potential Energy , Potential energy versus position graph and stable, unstable & neutral equilibrium , Spring force and Elastic Potential energy of a spring, Conservation of mechanical energy (kinetic and potential energies) , Power (Instantaneous and Average power).

COLLISIONS AND CENTRE OF MASS

Impulse of a force and Impulse-Momentum theorem, Idea about Impulsive forces,

Law of conservation of linear momentum and its applications, Elastic and inelastic collisions in one and two dimensions (Head-on and Oblique collisions), Coefficient of restitution and line of impact, Expression of loss in Kinetic energy in inelastic collision,

Centre of mass of discrete system: two-particle system and n-particle system, Centre of mass of continuous system: General formula, Centre of mass of symmetrical rigid bodies; centre of mass of uniform rod , Centre of mass of composite and truncated bodies , Motion of centre of mass: Velocity, Acceleration and linear momentum vector of centre of mass of the system , Momentum conservation and centre of mass motion.

06 Review Test - 2: Syllabus of Test No. 4 & 5**07 Semi Major Test - 1 : Syllabus of Test No. 1 to 6****08 Unit-5: CIRCULAR MOTION**

Kinematics of circular motion (Variables of motion (Angular Displacement, Angular Velocity, Angular acceleration), Relations among Angular Variables for constant angular acceleration , General relation among angular variables) , Dynamics of uniform circular motion. Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road) , Dynamics of non-uniform circular motion(Motion in a vertical circle)

ROTATIONAL MOTION

Kinematics of Rotational Motion about a fixed axis:

Comparison of linear and rotational motions, Moment of inertia, radius of gyration and its significance. Values of M.I. for simple geometrical objects (Ring, Rod and Disc with derivation and others with no derivation). Statement of parallel and perpendicular axes theorems and their applications, Moment of a force-torque, Equilibrium of rigid bodies, Angular momentum, Relation between torque and Angular momentum, Conservation of angular momentum with some examples, Pure Rolling or rolling motion on a smooth/rough horizontal surface. Expression for Rotational Kinetic Energy, Rolling motion on an inclined plane, Expression for acceleration and minimum friction coefficient.

09 Unit-6: THERMAL PHYSICS

(Thermal Expansion, Calorimetry, Heat Transfer, KTG & Thermodynamics)

Temperature and Thermal Expansion: (Temperature, Temperature scales, Brief idea about thermometers, Thermal expansion; thermal expansion of solids, liquids, and gases. Anomalous expansion)

Calorimetry : (Heat, Heat capacity, Specific heat capacity, Molar heat capacity, Water Equivalent, Heat of transformation – latent heat, Principle of Calorimetry, Heating curve, Phase diagram)

Heat transfer Conduction : (Process, Steady State, Law of Conduction, Thermal conductivity, Thermal resistance, Series and Parallel combinations of rods, Growth of ice on ponds), Convection: Process, Idea about Natural and Forced Convection, Radiation: Qualitative ideas of Black Body Radiation, Ideal Black Body, Absorptive Power, Emissive Power, Spectral Emissive Power, Kirchhoff's Law and its applications, Stefan's Law, Newton's law of cooling, Wien's displacement law and Green House effect, Solar constant.

Thermodynamics : Thermal equilibrium and definition of temperature (Zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics. Cyclic, Isochoric,

Isoobaric, Isothermal and Adiabatic processes, Second law of the thermodynamics: Reversible and irreversible processes. Heat engines and refrigerators.

Kinetic theory of gases : Gas Laws, Equation of state of a perfect gas, Brief idea of van der Waals' equation and Critical temperature, Assumptions, Concept of pressure. Different types of speeds of gas molecules, Maxwell's velocity distribution curve, Kinetic energy and temperature; Degrees of freedom, Law of equipartition of energy (statement only) and application to specific heat capacities of gases; Concept of mean free path.

10 Review Test - 3: Syllabus of Test No. 8 & 9

11 Unit-7: GRAVITATION

The universal law of gravitation (Newton's law of Gravitation), Gravitational Field and its Intensity, Brief idea about Inertial and Gravitational mass, Acceleration due to gravity and its variation with altitude and depth. Idea about variation in g due to Shape and Rotation of earth, Gravitational potential energy and gravitational potential, Kepler's laws of planetary motion (The law of orbits, Areas and Periods), Motion of Planets and Satellites in Circular orbits, Orbital velocity of a satellite, Total Energy and Binding Energy of a satellite, Escape velocity and escape energy, Geostationary satellites, Idea about of polar satellites, Weightlessness.

PROPERTIES OF MATTER AND FLUID MECHANICS

Elastic behavior, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy. Pressure, Pascal's law, Archimedes' Principle and Buoyancy. Floatation and Translatory equilibrium, Variation of Pressure with Depth, Atmospheric pressure and Gauge Pressure, Hydraulic Machines, Streamline and turbulent flow, Critical velocity and Reynolds's number, Principle of Continuity, Bernoulli's theorem and its applications. Speed of Efflux: Torricelli's law, Venturi-meter, Dynamic lift,

[For English/Hindi/Gujarati Medium Students]

Viscosity, Newton's law of viscous force, Stokes' law, terminal velocity, Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension ideas to drops, bubbles and capillary rise. Detergent and surface tension

12 Unit-8: OSCILLATIONS

(SHM, damped and forced oscillations & Resonance)

Periodic (harmonic) motion and Oscillatory motion, Periodic motion-period, frequency, displacement as a function of time, Periodic functions, Simple harmonic motion (SHM) and its equation; Velocity, Acceleration and Phase, Oscillations of a spring-restoring force and force constant. Equivalent spring constant of Series and parallel combinations, Energy in SHM – Kinetic and Potential energies, Simple pendulum-derivation of expression for its time period, Superposition of two SHMs of Same Frequency in the same direction, Free, forced and damped oscillations (qualitative ideas only), resonance.

WAVE MOTION AND DOPPLER'S EFFECT

Wave motion, Mechanical Waves, Longitudinal and transverse waves, Equation of Plane Progressive waves, Velocity of Transverse mechanical waves, Intensity of waves, Sound waves: Audible, Infrasonic and Ultrasonic waves, Speed of sound waves: Newton's formula and Laplace correction, Effect of temperature, Pressure and Humidity on speed of Sound waves, Some idea about description of sound waves as Displacement and Pressure waves, Characteristics of sound waves: Pitch, Loudness and Quality, Reflection and transmission of waves & Echo, Principle of superposition of waves, Interference and Beats, Stationary waves, Standing waves in strings and organ pipes, fundamental mode and harmonics. Resonance tube, Doppler Effect in Sound waves and Light Waves.

13 Review Test - 4: Syllabus of Test No. 11 & 12**14 Semi Major Test - 2: Syllabus of Test No. 8 to 13
Test No. 15 to 19 Full Syllabus****CHEMISTRY**

Test No. Unit Covered/Topic Covered

01 Unit-1: SOME BASIC CONCEPTS OF

CHEMISTRY : General Introduction: Importance and scope of chemistry. Laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses. Mole concept and molar mass; percentage composition and empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry.

STRUCTURE OF ATOM : Subatomic particles, Atomic models. Atomic number, isotopes and isobars. Concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, Bohr's Model concept of orbital, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals- Aufbau principle, Pauli's exclusion principles and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

02 Unit-2: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

: Why do we need to classify elements, Genesis of periodic classification. Modern periodic law and long form of periodic table, Nomenclature of elements with atomic number > 100, Electronic configuration of elements and types of elements. periodic trends in properties of elements- atomic radii, ionic radii, ionization enthalpy, electron gain enthalpy, electronegativity, valency.

03 Review Test - 1: Syllabus of Test No. 1 & 2**04 Unit-3: CHEMICAL BONDING AND MOLECULAR STRUCTURE**

: Kossel Lewis Approach to Chemical Bonding, Valence electrons, ionic bond, covalent bond, bond parameters,

Lewis structure, polar character of covalent bond, valence bond theory, resonance, geometry of molecules, VSEPR theory, concept of hybridization involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only). Hydrogen bond, Dipole Moment.

STATES OF MATTER : Gases and Liquids : Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws of elucidating the concept of the molecule, Boyle's law, Charle's law, Gay Lussac's law, Avogadro's law, ideal behaviour of gases, empirical derivation of gas equation. Avogadro number, ideal gas equation. Kinetic energy and molecular speeds (elementary idea), deviation from ideal behaviour, liquefaction of gases, critical temperature.

LIQUID STATE : Vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

05 Unit-4: THERMODYNAMICS : First law of thermodynamics-internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH , Hess's law of constant heat summation, enthalpy of : bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Introduction of entropy as state function, Second law of thermodynamics, Gibbs energy change for spontaneous and non-spontaneous process, criteria for equilibrium and spontaneity. Third law of thermodynamics- Brief introduction.

06 Review Test - 2: Syllabus of Test No. 4 & 5

07 Semi Major - 1: Syllabus of Test No. 1 to 6

08 Unit-5: EQUILIBRIUM : Equilibrium in physical and chemical processes and applications, dynamic nature of equilibrium, law of chemical equilibrium, equilibrium constant, factors affecting

equilibrium-Le Chatelier's principle. Relationship between equilibrium constant K and reaction Quotient Q.

Ionic equilibrium - ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of polybasic acids, acid strength, concept of pH., Hydrolysis of salts (elementary idea), buffer solutions, Henderson equation, solubility product, common ion effect (with illustrative examples).

09 Unit-6: REDOX REACTIONS : Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers, application of oxidation number, equivalent concept of oxidising and reducing.

HYDROGEN : Position of Hydrogen in Periodic Table, Dihydrogen (H_2), Hydrides, Occurrence, isotopes, preparation, properties and uses of hydrogen; hydrides ionic, covalent and interstitial; physical and chemical properties of water, heavy water; hydrogen peroxide-preparation, reactions, uses and structure, Dihydrogen as a fuel.

ORGANIC CHEMISTRY SOME BASIC PRINCIPLES AND TECHNIQUES : General introduction, Tetravalence of Carbon : Shapes of organic compounds, structural representation of organic compounds, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions.

10 Review Test - 3: Syllabus of Test No. 8 & 9

11 Unit-7: s-BLOCK ELEMENTS (Alkali and Alkaline Earth Metals) : Group I and group II elements:

General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens; uses. Preparation and Properties of some important Compounds: Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogencarbonate, biological importance of sodium and potassium. Anomalous behaviour of Be.

Industrial use of lime and limestone, biological importance of Mg and Ca. Some Important Compound of Calcium.

SOME p-BLOCK ELEMENTS : General Introduction of p-Block Elements.

Group 13 Elements : General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron, some important compounds: borax, boric acids, boron hydrides. Aluminium: uses, reactions with acids and alkalies.

Group 14 Elements : General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon, allotropic forms, physical and chemical properties: uses of some important compounds : (Carbon and Silicon) oxides, Important compounds of silicon and a few uses: silicon tetrachloride, silicones, silicates and zeolites & their uses.

12 Unit-8: HYDROCARBONS : Alkanes- Nomenclature, isomerism, conformations (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.

Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of hydrogen, halogens, hydrogen halides and water.

Aromatic Hydrocarbons - Introduction, IUPAC nomenclature; Benzene; resonance, aromaticity; chemical properties: mechanism of electrophilic substitution- Nitration sulphonation, halogenation, Friedel Craft's alkylation and acylation; directive influence of functional group in mono-substituted benzene; carcinogenicity and toxicity.

ENVIRONMENTAL CHEMISTRY : Environmental pollution: Air, water and soil pollution, chemical reactions in atmosphere, smogs, major atmospheric pollutants, acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming, pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategy for control of environmental pollution.

13 Review Test - 4: Syllabus of Test No. 11 & 12**14 Semi Major Test No.-2: Syllabus of Test No. 8 to 13**

Test No. 15 to 19 Full Syllabus

BIOLOGY

Test No. Unit Covered/Topic Covered

- 01 Unit-1: DIVERSITY IN LIVING WORLD : The living world :** What is living ? ; Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy – Museums, Zoos, Herbaria, Botanical gardens.
- Biological Classification :** Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids. Prokaryotic Cell (Bacteria).
- STRUCTURAL ORGANISATION IN ANIMALS:** Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (**cockroach**), Frog, Earthworm (Brief account only).
- 02 Unit-2: Plant Kingdom :** Salient features and classification of plants into major groups-Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two examples of each category); Angiosperms- classification up to class, characteristic features and examples).
- ANIMAL KINGDOM :** Salient features and classification of animals-nonchordate up to phyla level and chordate up to classes level (Three to five salient features and at least two examples of each category).
- 03 Review Test - 1 : Syllabus of Test No. 1 & 2 (Unit No. : 1 & 2)**
- 04 Unit-3: STRUCTURAL ORGANISATION IN PLANTS :** Morphology and modifications, morphology and functions of different parts of flowering plants: Root, Stem, Leaf, Inflorescence, Cymose and racemose, flower, Fruit and Seed & Families. [Cruciferae, Fabaceae, solanaceae liliaceae]
- Digestion and absorption;** Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Caloric value of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders – PEM, indigestion, constipation, vomiting, jaundice, diarrhoea, Vitamins.
- 05 Unit-4: Anatomy of flowering plants:** Anatomy and function of different tissues, tissue system, internal structure of Root, Stem, Leaf, secondary Growth.
- Breathing And Respiration:** Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans-Exchange of gases, transport of gases and regulation of respiration; Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.
- 06 Review Test - 2 : Syllabus of Test No. 4 & 5 (Unit No. : 3 & 4).**
- 07 Semi Major Test- 1 : Syllabus of Test No. 1 to 6 (Unit No. : 1 to 4).**
- 08 Unit-5: CELL STRUCTURE AND FUNCTION :** Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles-structure and function; Endomembrane system-endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, micro bodies; Cytoskeleton, cilia, flagella, centrioles (ultra structure and function); Nucleus-nuclear membrane, chromatin, nucleolus.
- Cell division: Cell cycle,** mitosis, meiosis and their significance.
- Body fluids and circulation** composition of Blood, Blood Corpuscles, Blood Groups, Blood clotting, RH factor.
- Human circulatory system - Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity; Disorders of circulatory system- Hypertension, Coronary artery disease, Angina pectoris, Heart failure.

- 09 Unit-6: Respiration in plants:** Exchange of gases; Cellular respiration-glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); The respiratory balance sheet, Energy relation - Number of ATP molecule generated, Amphibolic pathways; Respiratory quotient.
- Enzymes-** types, properties, enzyme action, factors affecting enzyme action.
- Biomolecules-** structure and function of proteins, carbohydrates, lipids, nucleic acids.
- Excretory products and their elimination:** Modes of excretion Ammonotelism, ureotelism, uricotelism; Human excretory system structure and function; Urine formation, Osmoregulation; Regulation of kidney function-Renin-angiotensin, Atrial Natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion; Disorders; Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis, artificial kidney, kidney transplantation.
- 10 Review Test - 3: Syllabus of Test No. 8 & 9 (Unit No.: 5 & 6).**
- 11 Unit-7: Photosynthesis in higher plants** as a means of Autotrophic nutrition; Site of photosynthesis take place; pigments involved in Photosynthesis (Elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non cyclic and photophosphorylation; Chemiosmotic hypothesis; Photorespiration C_3 and C_4 pathways; Factors affecting photosynthesis.
- Mineral nutrition:** Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as a method to study mineral nutrition; Nitrogen metabolism-Nitrogen cycle, biological nitrogen fixation.
- Neural Control And Coordination:** Neuron and nerves; Nervous system in humans - central nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sensory perception.
- 12 Sense organs :** Elementary structure and function of eye and ear.
- Unit-8 : Transport in plants :** Movement of water, gases and nutrients; Cell to cell transport-Diffusion, facilitated diffusion, active transport; Plant – water relations – Imbibition, water potential, osmosis, plasmolysis; Long distance transport of water – Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration-Opening and closing of stomata; Uptake and translocation of mineral nutrients-Transport of food, phloem transport, Mass flow hypothesis; Diffusion of gases (brief mention).
- Plant growth and development:** Seed germination; Phases of Plant growth and plant growth rate; Conditions of growth; Differentiation, dedifferentiation and redifferentiation; Sequence of developmental process in a plant cell; Growth regulators-auxin, gibberellin, cytokinin, ethylene, ABA; Seed dormancy; Vernalisation; Photoperiodism.
- Chemical coordination and integration :** Endocrine glands and hormones; Human endocrine system-Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulators, Hypo- and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goitre, exophthalmic goitre, diabetes, Addison's disease).
- Locomotion and Movement:** Types of movement- ciliary, flagellar, muscular; Skeletal muscle- contractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus); Joints; Disorders of muscular and skeletal system-Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.
- 13 Review Test - 4: Syllabus of Test No. 11 & 12 (Unit No.: 7 & 8).**
- 14 Semi Major Test - 2: Syllabus of Test No. 8 to 13 (Unit No.: 5 to 8).
Test No. 15 to 19 Full Syllabus**