<table>
<thead>
<tr>
<th>TEST NUMBER</th>
<th>TEST DATE</th>
<th>PHYSICS</th>
<th>CHEMISTRY</th>
<th>BIOLOGY</th>
<th>TEST PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1802/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>All India Online Open Test AIIMS 01:30 PM to 05:00 PM</td>
</tr>
<tr>
<td>02</td>
<td>0403/2018 (Sunday)</td>
<td>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 logarithm 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 &amp; Dividendo rule. TRIGONOMETRY: Angle &amp; its measurement (Sexagesimal and Circular system), Trigonometric-ratios, Trigonometric identities , Four Quadrants &amp; ASTC rule, T-ratios for general angles, Addition/ubtraction Formulae, Small angle Approximation, Ranges offunctions. CO-ORDINATE GEOMETRY: Define Origin, Axis or Axes, Coordinates 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 STRUCTURE OF ATOM: Atomic number, isotopes and isobars. Concept of shells and subshells, dual nature of matter and light, de Broglie’s relationship, Heisenberg uncertainty principle, concept of orbital, quantum numbers, shapes of s, p, and d orbitals, rules for filling electrons in orbitals- Aufbau principle, Pauli exclusion principles and Hund’s rule, electronic configuration of atoms, stability of half filled and completely filled orbitals. 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 &gt; 100, Electronic configuration of elements and types of elements, periodic trends in properties of elements-atomic radii, ionic radii, ionization enthalphy, electron gain enthalphy, electronegativity, valency. 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. EQUILIBRIUM: Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of chemical equilibrium, equilibrium constant, factors affecting equilibrium-Le Chatelier’s principle. 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). SOME BASIC CONCEPTS OF CHEMISTRY: General Introduction: Important and scope of chemistry. Laws of chemical combination, Dalton’s atomic theory: concept of elements, atoms and molecules. Structural Organization in Plants : Morphology and family modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence-cymose and racemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus). DIVERSITY IN LIVING WORLD: What is living?: Biodiversity; Need for classification; Three domains of life; Taxonomy &amp; Systematics; Concept of species and taxonomical hierarchy: Binomial nomenclature; Tools for study of Taxonomy-Museums, Zoos, Herbaria, Botanical gardens, key Plant Diversity : Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids. Prokaryotic Cell (Bacteria) 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), Alternation of generation concept. 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). Structural Organization in Animals : Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only) Biomolecule: Chemical constituents of living cells: Biomolecules-structure and function of proteins, carbohydrates, lipids, nucleic acids. 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.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

ELECTROSTATICS
Electric charges and their basic properties, Conductors and Insulators, Method of charging: Charging by Friction, Charging by Induction and Charging by Conduction, Gold-leaf Electroscope. Coulomb’s law-force between two point charges, force, between multiple charges and Superposition principle. Equilibrium of charge systems and SHM, Electric field Intensity, electric field due to a point charge and a system of charges. Electric field due to an arc. Electric field on an axially point of Ring, Electric field lines and their properties, Electric flux, statement of Gauss’s theorem and its applications to find field due toInfinitely long straight wire, Uniformly charged infinite plane sheet. Uniformly charged thin spherical shell (field inside and outside) Electric potential, Potential difference, Electric potential due to A point charge, A system of charges, Ring(on an axial point).Conducting and non conducting sphere); Electrical potential energy of a system of two/more than two point charges, Equipotential surfaces. Relation between Field and Potential, Motion of charged particle in Electric field, Electric dipole and dipole moment(Electric Potential due to a dipole, Electric field due to a dipole. Torque on a dipole in a uniform electric field, Electric potential energy of electric dipoles in an electrostatic field, Work done in rotating a dipole)

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 Atomic and molecular masses. Mole concept and molar mass; percentage composition and empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry.

THERMODYNAMICS: First law of thermodynamics-internal energy and enthalpy, heat capacity and specific heat, measurement of U and H, Hess’s law of constant heat summation, enthaphy 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.

REDOX REACTIONS: Concept of oxidation and oxidation and reduction, redox reactions oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers.

HYDROGEN: Position of Hydrogen in Periodic Table, Dihydrogen (H2), Hydrides, Occurrence, isotopes, preparation, properties and uses of hydrogen; hydridesionic, covalent and interstitial; physical and chemical properties of water, heavy water; hydrogen peroxide-preparation, reactions, uses and structure. Dihydrogen as a fuel.


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, halogen, hydrogen halides and water.

Aromatic Hydrocarbons - Introduction, IUPAC nomenclature; Benzene; resonance, aromaticity; chemical properties.
<table>
<thead>
<tr>
<th>TEST NUMBER</th>
<th>TEST DATE</th>
<th>PHYSICS</th>
<th>CHEMISTRY</th>
<th>BIOLOGY</th>
<th>TEST PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>various variables of motion and their applications to variable acceleration. Equations of Motion with constant acceleration (scalar and vector forms), Motion of 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 &amp; wind based questions)</td>
<td>mechanism of electrophilic substitution-Nitration sulphonation, halogenation, Friedel Crafts' alkylation and acylation; directive influence of functional group in mono-substituted benzene; carcinogenicity and toxicity. 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. Industrial use of lime and limestone, biological importance of Mg and Ca. 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. 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, Charles'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).</td>
<td>system-Hypertension, Coronary artery disease, Angina pectoris. Heart failure. Human excretory system: Excretory products and their elimination: Modes of excretion- Ammonotelism, ureotelism, uricotelism. 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: Uremia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney. Human Physiology-II: 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. 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; Sense organs; Elementary structure and function of eye and ear. Chemical Coordination and Regulation : 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, goiter, exophthalmic goiter, diabetes, Addison’s disease).</td>
<td></td>
</tr>
</tbody>
</table>
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).

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).

MAGNETIC EFFECT OF CURRENT AND MAGNETISM
Concept of magnetic field, Oersted's experiment, Biot-Savart law and its application to current carrying circular loop and straight wire, Ampere's law and its applications to (Infinitely long straight wire, Straight and toroidal solenoids), Circular motion of a moving charged particle in uniform magnetic field, Force on a moving charge in uniform magnetic and electric fields (Lorentz force), Force on a current-carrying conductor in a uniform magnetic field, Force between two parallel current-carrying conductors-definition of ampere, Torque experienced by a current loop in a magnetic field, Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron, Bar Magnet (Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis, Torque on a magnetic dipole (bar magnet) in a uniform magnetic field, Bar magnet as an equivalent solenoid, Magnetic field lines), Earth's magnetic field and magnetic elements, Magnetic properties of Materials (Diamagnetism with examples, Paramagnetism with examples, Ferromagnetism with examples and brief analysis of magnetic Hysteresis, Electromagnets and factors affecting their strengths, Permanent magnets).

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.

ELECTROMAGNETIC INDUCTION
Magnetic Flux, Electromagnetic induction (Faraday's Experiments), Faraday's law, Induced emf, induced, current and
<table>
<thead>
<tr>
<th>TEST NUMBER</th>
<th>TEST DATE</th>
<th>PHYSICS</th>
<th>CHEMISTRY</th>
<th>BIOLOGY</th>
<th>TEST PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>18/03/2018</td>
<td><strong>ROTATIONAL MOTION</strong> 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.</td>
<td><strong>SOLID STATE</strong> : Classification of solids based on different binding forces; molecular, ionic covalent and metallic solids, amorphous and crystalline solids (elementary idea), unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties. Band theory of metals, conductors, semiconductors and insulators.</td>
<td><strong>REPRODUCTION</strong>: Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species; Modes of reproduction - Asexual and sexual, Asexual reproduction; Modes-Binary fission, sporation, budding, gemmule, fragmentation; vegetative propagation in plants, Pre-fertilization events, gametogenesis, gamete transfer &amp; Post fertilization events.</td>
<td>AIIMS</td>
</tr>
</tbody>
</table>

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-Degree of freedom, Law of equipartition of energy (statement only) and application to specific heat capacities of gases; Concept of mean free path.

RAY OPTICS AND OPTICAL INSTRUMENTS
Reflection of light; Laws of Reflection, Reflection at Plane Surface (Plane Mirror); Formation of Image, Deviation, Rotation of mirror; Number of images, velocity of image. Minimum length of mirror to see full image of a man, Field of view, Reflection at Spherical Surface (Curved Mirror): Rule of image tracing, Image formation in concave and convex mirrors, Focal length of spherical mirrors, Relation between u, v and (i.e. Mirror Equation for Parallel rays, Sign convention, Magnification), Refraction of light at Plane Surface (Snell’s law, Total internal reflection and its applications (Mague, Looming, Diamond, prism and optical fibers), Optical Path, Lateral and normal shift), Refraction at spherical surfaces (single and double surface), Lenses: Thin lens formula, Lens-maker’s formula, Magnification, Power of a lens, Combination of thin lenses in contact, Combination of a lens and a mirror, Silvering of Lenses, Chromatic and Spherical Aberrations, Refraction and dispersion of light through a prism, Combinations of prisms, Some Natural Phenomena due to Sunlight (Rainbow-dispersion of sun light and TIR, Scattering of light- blue colour of the sky and reddish appearance of the sun at sunrise and sunset), Optical instrument (Human eye, image formation and accommodation, correction of eye defects (myopia, hypermetropia and astigmatism) using lenses, Microscopes and telescopes (reflecting and refracting) and their magnifying powers)

PROPERTIES OF MATTER AND FLUID MECHANICS
Elastic behavior, Stress-strain relationship, Hook’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, 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

SURFACE CHEMISTRY: Adsorption-physiosorption and chemisorption; factors affecting adsorption of gases on solids, catalysis homogeneous and heterogeneous, activity and selectivity-enzyme catalysis; colloidal state: distinction between true solutions, colloids, mixtures of colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation; emulsions-types of emulsions.

p-BLOCK ELEMENTS: General Introduction to 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, allotropics forms, physical and chemical properties; uses of some important compounds: (Carbon & Silicon) oxides. Important compounds of silicon and a few uses: silicon tetrachloride, silicides, silicones and zeolites, their uses.
Group 15 elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; preparation and properties of ammonia and nitric acid, oxides of nitrogen (structure only); Phosphorous- allotropic forms; compounds of phosphorus; preparation and properties of phosphine, halides (PC13, PC15) and oxoacids (elementary idea only).
Group 16 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen: preparation, properties and uses; classification of oxides: ozone. Sulphur - allotropic forms; compounds of sulphur: preparation, properties and uses of sulphur dioxide H2S; sulphuric acid: industrial process of manufacture, properties and uses, oxoacids of sulphur (structures only).
Group 17 elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens: preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures only).
Group 18 elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

General Principles and Processes of Isolation of Elements: Metal extraction and its applications, Speed of Effusion, law of combining volumes, law of combining weights, law of independent action, law of multiple proportions, law of adding combining weights, law of combining volumes, law of combining weights, law of independent action, law of multiple proportions.

BIOLOGY
Biological and Human Welfare: Microbes in human welfare- In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

Biotechnology: Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology), Molecular diagnosis.

Biotechnology and Its Applications: Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms-Bt crops; Transgenic Animals; Biosafety Issues-Biopiracy and patents.

GENETICS-II
Molecular basis of Inheritance: Structure and function of protein, carbohydrate lipid and Nucleic acid (Protoplasm) Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, genetic code, translation; Gene expression and regulation-Lac Operon; Genome and human genome project; DNA fingerprinting.

Biological and Human Welfare (Domestication of Plants): Improvement in food production, Plant breeding, tissue culture, single cell protein, Biortification.

ORIGIN AND EVOLUTION: Evolution: Origin of life; Biological evolution and evidences for biological evolution from Paleontology, comparative anatomy, embryology and molecular evidence); Darwin’s contribution, Modern Synthetic theory of Evolution; Mechanism of evolution-Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg’s principle; Adaptive Radiation; Human evolution.

Biological and Human Welfare : Health and Disease: Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ringworm); Basic concepts of immunology-vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse. Apiculture and Animal husbandry (Domestication of Animals).

Ecology and environment & Demography: Organisms and environment: Habitat and niche; Population and ecological
PHYSICS

WAVE OPTICS: (Nature of light, Interference, Diffraction & Polarization)

GRAVITATION

OSCILLATIONS
(SHM, damped and forced oscillations & Resonance)

MODERN PHYSICS
Photoelectric effect (Hertz observation, Hallwachs and Lenard's observations. Einstein's photoelectric equation - particle nature of light (photon). Matter waves (Wave nature of particles; de Broglie relation. Davission-Germer experiment (experimental details should be omitted; only conclusion should be explained). Atoms (Alpha-particle scattering experiments; Rutherford's model of atom, Bohr model, energy levels, hydrogen spectrum). X-rays and their elementary idea. Nuclei (Composition and size of nucleus, Atomic masses, isotopes, isobars, isotones and isodiapheres, Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number. Nuclear fission and fusion, Nuclear reactor, Nuclear Force, influence of halogen for monosubstituted compounds only. Uses and environment effects of dichloromethane, trichloromethane, tetrachloromethane, isofluorine, freons, DDT. COORDINATION COMPOUNDS: Coordination compounds: Introduction, ligands, coordination number, colour, magnetic properties and shapes. IUPAC nomenclature of mononuclear coordination compounds, isomerism (structural and stereo) bonding in coordination compound, Werner's theory (VBT, CFT; Importance and applications of coordination compounds (in qualitative analysis, biological systems). d and f Block Elements: General introduction, electronic configuration, characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, melting point ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation. Preparation and properties of K, Cr, O, and KMnO4. Lanthanoids - electronic configuration, oxidation states, chemical reactivity, and lanthanoid contraction and its consequences. Actinoids: Electronic configuration, oxidation states and comparison with lanthanoids. Some application of d & f block elements.

CHEMISTRY
ALCOHOLS, PHENOLS AND ETHERS:
Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses with special reference to methanol and ethanol. Some commercially important alcohols.
Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.
Ethers: Nomenclature, methods of preparation, physical and chemical properties.
Aldehydes, Ketones and Carboxylic Acids: Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties; and mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses.
Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

ORGANIC COMPOUNDS CONTAINING NITROGEN:
Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.
Cyano groups and isocyanides - will be mentioned at relevant places.
Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.
Ecosystem: Patterns, components; productivity and decomposition; Energy flow; Pyramids of number, biomass, energy; Nutrient cycling (carbon and phosphorous); Ecological succession; Ecological Services-Carbon fixation, pollination, oxygen release.

BIOLOGY
Environmental Issues: Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warming; Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.

ENVIRONMENTAL ISSUES:
Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warming; Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.
**PHYSICS**

- **WAVE MOTION AND DOPPLER'S EFFECT**

- **SEMICONDUCTOR AND DIGITAL ELECTRONICS**
  - Classification of Metals, Conductors and Semi-conductors on the basis of (Conductivity, Energy bands in solids (qualitative ideas only)), Intrinsic Semi-conductor, Extrinsic Semi-conductor (n-type and p-type), p-n Junction, p-n Junction formation, Barrier potential, Semiconductor diode: I-V characteristics in forward and reverse bias, Application of Junction Diode as a Rectifier and Filter (only qualitative idea), Special purpose p-n junction diodes and their I-V characteristics (LED, Photodiode, Solar cell, Zener diode), Junction Breakdown: Zener and Avalanche breakdown, Zener diode as a voltage regulator, Junction Transistor (n-p-n and p-n-p Transistor structure and action, Characteristics of a transistor, Transistor as an amplifier (common emitter configuration), Transistor as a switch (i.e. ON and OFF), Transistor as an oscillator with feedback effects), Digital Electronics and Logic gates (Law of Boolean algebra and De Morgan's Theorem, Basic Logic gates (OR gate, AND gate, NOT gate), Combination of gates (NAND gate, NOR gate), Brief idea about ICs).

**CHEMISTRY**

- Biomolecules: Carbohydrates - Classification (aldoses and ketoses), monosaccharide (glucose and fructose), D. L. configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen): importance.
- Proteins - Elementary idea of - amino acids, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins; enzymes.
- Hormones - Elementary idea (excluding structure).
- Vitamins - Classification and function.
- Nucleic Acids: DNA and RNA
- Chemistry in Everyday Life: Chemicals in medicines (Drugs) - analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.
- Chemicals in food - preservatives, artificial sweetening agents, elementary idea of antioxidants.
- Cleansing agents - soaps and detergents, cleansing action.
- Methods of purification qualitative and quantitative analysis

**BIOLOGY**

- Commercial importance.

**PRINCIPLES OF COMMUNICATIONS**


---

<table>
<thead>
<tr>
<th>TEST NUMBER</th>
<th>TEST DATE</th>
<th>PHYSICS</th>
<th>CHEMISTRY</th>
<th>BIOLOGY</th>
<th>TEST PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>25/03/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>AIIMS</td>
</tr>
<tr>
<td>05</td>
<td>01/04/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>AIIMS</td>
</tr>
<tr>
<td>TEST NUMBER</td>
<td>TEST DATE</td>
<td>PHYSICS</td>
<td>CHEMISTRY</td>
<td>BIOLOGY</td>
<td>TEST PATTERN</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>----------</td>
<td>------------</td>
<td>----------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>06</td>
<td>15/04/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>All India Open Test AIIMS 01:00 PM to 04:30 PM</td>
</tr>
<tr>
<td>07</td>
<td>22/04/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>All India Open Test AIIMS 01:00 PM to 04:30 PM</td>
</tr>
<tr>
<td>08</td>
<td>29/04/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>All India Open Test AIIMS 01:00 PM to 04:30 PM</td>
</tr>
<tr>
<td>09</td>
<td>13/05/2018 (Sunday)</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>Full Syllabus</td>
<td>All India Open Test AIIMS 01:00 PM to 04:30 PM</td>
</tr>
</tbody>
</table>

Note: - One Paper of 3 Hours (Objective). Pattern Similar to AIIMS

Visit us at www.OnlineTestSeries.in