

SCREENING TEST SYLLABUS -STATE

PHYSICS

Motion & Laws of motion Distance and displacement, Speed & velocity, Average speed and Average velocity, Acceleration, Motion Graphs, Uniform acceleration, Uniform Circular motion, Kinematic equations of motion, Graphical derivation, Numerical problems. Newton's three laws of motion, **Work and Energy**: Electric Work, Positive negative and zero work, Work done against Gravity, Energy, Mechanical Energy, Kinetic energy & Potential energy, Energy transformations, Law of Conservation of energy, Power, Commercial unit of energy, Calculation of Electrical Energy Consumed. **Gravitation**: Universal Law of Gravitation, Acceleration due to Gravity, Mass and Weight, Free fall and Weightlessness, Circular Motion. **Sound**: Characteristics of Wave, Forced Vibration and resonance, Electromagnetic waves, Mechanical waves, Production and propagation of sound, Characteristics of Sound, Speed of Sound in Different medium, Reflection of Sound, Application of Reflection of Sound, Reverberation, Range of Hearing, Application of Ultrasonic and Infrasonic Sound, Noise Pollution. **Refraction of Light**: Refraction & Laws of Refraction, Refractive Index, Refraction through glass slab, Refraction through spherical lenses, Lens formula & Magnification, Power of Lens, Compound Microscope, Human eye, Power of Accommodation, Defects of Vision and their correction, Dispersion, Atmospheric Refraction, Rainbow, Tyndall Effect, Scattering of Light, Total Internal Reflection, Critical angle. **Electric Current**: Electric Charges, Electric Current, Electrical Components and Electrical Circuits, Capacitor, Potential Difference, Combination of Cells, Ohms law, Series and Parallel connection of Resistors, VI graph.

CHEMISTRY

Structure of Atom: Atom, Molecules, Discovery of protons, electrons and neutrons Thomson's model of an atom, Rutherford's model of an atom, Bohr's model of atom, Distribution of electrons in orbits, Valency, Atomic number and Mass number, Isotopes, Isobars and Isotones **Periodic Table**: Modern periodic law, Electron configuration of elements and their positions, Main group elements and their properties, Noble gases, Transition elements, Lanthanoids and actinoids, Determining group number and period number, Periodic trend – Size of atom – In group and periods **Chemical Reactions of Organic compounds**: Substitution reactions, Addition reactions, Polymerisation – Addition polymers, Condensation polymers, Thermal cracking Combustion of hydrocarbons Preparation and uses of some important organic compounds- Methanol, Ethanol, Ethanoic acid, Esters Medicines **Solutions**: Different types of solutions, Concentration of solution, Saturated, Unsaturated and Supersaturated solution, Mass percentage, Solubility, True solution, Suspension and Colloids **Acids, Bases and Salts**: Acids and bases in the laboratory, Reaction of acids and bases with metals, Reaction of acids with metal carbonates and metal hydrogen carbonates, Reaction between acids and bases, Reaction of metallic oxides with acids Reaction of nonmetallic oxides with bases, pH and its importance, Salts, Preparation and properties of sodium hydroxide, bleaching powder, washing soda, baking soda, plaster of paris **Metals & Non Metals**: (Physical properties of metals & non-metals, Reaction of metals with oxygen, water, acids & solutions of other metal salts, Reactivity series, Reaction of metals with non-metals, Extraction of metals, Corrosion) **Nomenclature of Organic Compounds and Isomerism**: Nomenclature of alkanes with branching, Nomenclature of alkenes and alkynes, Nomenclature of compounds containing functional group hydroxyl group, carboxyl group, aldehyde group, keto group, halo group, alkoxy group, Isomerism- chain isomerism, functional isomerism, position isomerism, metamerism

MATHEMATICS

Real Numbers • New Numbers: Introduction to lengths that cannot be expressed as fractions (rational numbers), such as the diagonal of a square with side 1. • Rational and Irrational Classification: Defining real numbers as the combined set of rational and irrational numbers. • Number Line & Absolute Value: Geometrical representation of real numbers on a line; ordered relationships; definition and properties of absolute value as distance from zero or between two numbers. • Midpoint Formula: Finding the coordinate midpoint between two values on a real number line using the midpoint average formula. • Irrational Multiplication: Multiplication rules for indices, computing approximations of surds, and working with scaling factors of real variables.

Arithmetic Sequences, Progressions & Algebra • Sequences & Common Difference: Defining number sequences, analyzing polygon angle trends, and determining the common difference by subtracting consecutive terms. • Position-Term Dynamics: Finding unknown terms from position and term variations, and checking if specific values belong to a sequence. • Averages & Balances: Middle-term and sum properties of odd consecutive terms, and constant-sum balances of equidistant positions. • Algebraic Representation: Formulating the general algebraic expression for any arithmetic progression sequence, where a matches the common difference. • Sequence Constraints: Using algebraic notation to mathematically prove whether a sequence yields integer variables or perfect squares. • Sum of Natural, Even, & Odd Numbers: Summation identities for continuous series starting from 1, continuous even series, and continuous odd series. • General Algebraic Form of Sums: Computing the sum of the first n terms using the product endpoints and working with standard quadratic sequence sum equations. **Pairs of Equations**: Formulating a system of two linear equations with two variables from real-world math problems; solving via substitution and elimination methods. • Multiplication Identities: Expanding algebraic products, squaring trinomials, and factoring expressions using standard algebraic identities. **Circles And Angles** • Central Angles & Alternating Arcs: Angle subtended by an arc at the center versus the angle it subtends at a point on its alternate arc. • Semicircular Theorems: Proof and application showing that the angle inscribed in a semicircle is a right angle. • Segments of a Circle: Properties showing that angles in the same segment of a circle are equal, and the sum of the angles in alternate segments equals 180° . • Cyclic Quadrilaterals: Characteristics of cyclic quadrilaterals; proving that opposite angles sum to 180° ; verifying outer angle equality to the interior opposite angle. • Circle Measures & Mensuration: Proportional scalability of diameter, radius, and circumference computing area of circles, circular sectors, segments, and circular rings. **Geometry Of Parallel Lines & Similarity** • Parallel Lines: Intercept theorems; analyzing how parallel lines cut transversal lines into equal or proportionally scaled sections. • Similar Triangles: Scale factors and proportionality criteria for similar triangles (AAA, SSS, SAS); checking if geometric shapes are scaled up or down proportionally. • Area Ratios: Proving that the scale factor of the area of similar triangles is the square of the scale factor of their sides. **Polynomials & Polynomial Pictures** • Polynomial Fundamentals: Definition of single-variable polynomials, identifying coefficients, and determining the degree of a polynomial. • Types of Polynomials: General configurations for first-degree, second-degree, and third-degree expressions. • Polynomial Pictures (Graphs): Graphing linear equations and graphing second-degree quadratic equations (parabolas) on a coordinate layout. **Mensuration: Prisms** • Prism Geometry: Properties of flat-faced solids, categorizing prisms by their bases. • Volume: • Surface Area: Calculating Lateral Surface Area, and Total Surface Area for varied prism configurations. **Statistics & Data Handling** • Arithmetic Mean: Calculating central tendency averages for single distributions. • Grouped Data Analysis: Structuring raw numbers into frequency distribution tables using class intervals, class marks, and computing grouped averages. Measures of central tendency including calculation of mean, median, and mode for ungrouped raw data arrays.

BIOLOGY

To Life Processes: Metabolism; Internal environment and Homeostasis; Plasma membrane and Exchange of substances; Photosynthesis and Nutrients; Plant services; Plant protection **Life Processes – Digestion, Transportation, Respiration, Excretion and Control & Coordination** Digestive system; Digestion; Absorption of nutrients; Structure of villus; Structure of blood; Heart; Health of heart; Transport in plants Human respiratory system; Gaseous exchange; Cellular respiration; Respiration in other organisms; Synthesis of urea; Formation of urine; Excretion in plants; Hemodialysis; Kidney transplantation; Homeostasis Neurons; Neuroglial cells; Brain and Spinal Cord; Transmission of Impulses; Types of Neurons; Autonomous Nervous System; Spontaneous responses **Body Movements** Diversity in movement; Muscles; Skeletal system; Different frameworks; Muscles and exercise; Bones, muscles-disorders; Bones and evolution; Plant movements **Reproductive Health** Gender Justice and Sex; A Healthy Pregnancy; Foetal Growth; Antenatal Care; Motherhood; Importance of Breast Milk; Vaccination; Sexually Transmitted Infections **Classification Of Organisms** Three Domain classification; Classification of Animals; Classification of Plants; Classification of newly Discovered Organisms; Evolutionary Tree; DNA Barcoding **Genetics Of Life** Structure of DNA; Human Chromosomes; Gene; RNA; Protein synthesis; Mendelian Genetics – Monohybrid and Dihybrid crosses; Non-Mendelian Inheritance; Genetic Processes responsible for Variations; Mutation. **Evolution** Lamarckism and Darwinism; Evidences of Evolution; Human Evolution.