

Admission to class XI

Syllabi for preparation

MATHEMATICS

REAL NUMBERS : Euclid's division lemma, Fundamental Theorem of Arithmetic - statements and examples, Proofs of results - irrationality of $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, decimal expansions of rational numbers in terms of terminating/non-terminating recurring decimals. **POLYNOMIALS** : Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials. Statement and problems on division algorithm for polynomials with real coefficients. **PAIR OF LINEAR EQUATIONS IN TWO VARIABLES** : Pair of linear equations in two variables and their graphical solution. Geometric representation of different possibilities of solutions/inconsistency. Algebraic conditions for number of solutions. Solution of pair of linear equations in two variables algebraically - by substitution, by elimination and by cross multiplication. **TRIANGLES** : Definitions, Theorems, examples, counter examples of similar triangles. **CIRCLES** : Tangents to a circle. (Prove: The tangent at any point of a circle is perpendicular to the radius through the point of contact; The lengths of tangents drawn from an external point to circle are equal.) **CONSTRUCTIONS** : Division of a line segment in a given ratio (internally), Tangent to a circle from a point outside it, Construction of a triangle similar to a given triangle. **TRIGONOMETRY** : Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence. Values (with proofs) of the trigonometric ratios of 0° , 30° , 45° , 60° and 90° . Relationships between the ratios. **TRIGONOMETRIC IDENTITIES** : Proof and applications of the basic trigonometric identities. Trigonometric ratios of complementary angles. **STATISTICS** : Mean, median and mode of grouped data. Cumulative frequency graph.

QUADRATIC EQUATIONS : Standard form of a quadratic equation $ax^2 + bx + c = 0$, ($a \neq 0$). Solution of the quadratic equations (only real roots) by factorization, by completing the square and by using quadratic formula. Relationship between discriminant and nature of roots. Problems related to day to day activities. **ARITHMETIC PROGRESSIONS** : Derivation of standard results of finding the n^{th} term and sum of first n terms and examples. **HEIGHTS AND DISTANCES** : Simple and believable problems on heights and distances, involving standard angles of elevation / depression. **STATISTICS AND PROBABILITY** : Classical definition of probability. Connection with probability as given in Class IX. Simple problems on single events, not using set notation. **COORDINATE GEOMETRY : LINES (In two-dimensions)** Review the concepts of coordinate geometry including graphs of linear equations. Geometrical representation of quadratic polynomials. Distance between two points and section formula. **MENSURATION : AREAS RELATED TO CIRCLES** : Area of a circle; area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (central angle of 60° , 90° & 120° only. Plane figures involving triangles, simple quadrilaterals and circle.) **SURFACE AREAS AND VOLUMES** : Problems on finding surface areas and volumes of combinations of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones. Frustum of a cone. Problems involving converting one type of metallic solid into another and other mixed problems. (Internal) Area of a triangle.

PHYSICS

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of Electric current and its applications in daily life. Electric Power, Inter relation between P, V, I &

R. Magnetic effects of current : Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's left hand rule. Electro magnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Direct current. Alternating current : frequency of AC. Advantage of AC over DC. Domestic electric circuits. **Light:** Reflection of light at curved surfaces, Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length. Mirror Formula, Magnification. Refraction; laws of refraction, refractive index. Refraction of light by spherical lens, Image formed by spherical lenses, Lens formula, Magnification. Power of a lens; Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses. Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life.

CHEMISTRY

Chemical reactions : Chemical Equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction. **Acids, bases and salts :** Their definitions in terms of furnishing of H⁺ and OH⁻ ions, General properties, examples and uses, concept of pH scale, importance of pH in everyday life; preparation and uses of sodium hydroxide, Bleaching powder, Baking soda, washing soda and Plaster of Paris. **Metals and non metals :** Properties of metals and non-metals, reactivity series, formation and properties of ionic compounds, basic metallurgical processes, corrosion and its prevention. **Carbon compounds :** Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series; Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydrocarbons and unsaturated hydrocarbons. Chemical

properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents. **Periodic classification of elements :** Need for classification, Modern Periodic table, gradation in Properties, valency, Atomic number, metallic and non-metallic properties.

BIOLOGY

Life Processes : Basic concept of nutrition, respiration, transport and excretion in plants and animals. Control and Co-ordination in Animals and Plants, Tropic movements in plants; Introduction to plant hormones; control and co-ordination in animals: nervous system; voluntary, involuntary and reflex action, chemical co-ordination: animal hormones. **Reproduction :** Reproduction in animal and plants (asexual and sexual) reproductive health-need for and methods of family planning. safe sex vs HIV/AIDS. Child bearing and women's health. **Heridity and Evolution :** Heridity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution. **Our environment:** Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable, substances.

ENGLISH

Knowledge of basic grammar, vocabulary, spelling, comprehension of given passages, writing and expression etc.