

University Polytechnic, Birla Institute of Technology, Mesra

Syllabus for Entrance Test for Admission in Diploma in Engineering (Lateral Entry)

Science

Chemical Reaction and Equations: Chemical reactions and balancing of chemical equations. Different types of reactions like combination, decomposition, displacement, double displacement, oxidation and reduction.

Acids, Bases and Salts: Acids, bases and salts, their identification using indicators. The characteristic of acids, bases and salts. Importance of pH.

Metals and Non-metals: Physical and chemical properties of metals and non-metals. Extraction of metals from their ores.

Carbon and its Compounds: Covalent bond, Nomenclature, isomerism and chemical properties of compounds. Functional groups and uses of ethanol and ethanoic acid.

Periodic Classification of Elements: Historical background of Classification of Elements, Introduction of Modern Periodic Table and general trends in properties of elements with reference to Modern Periodic Table.

Light: Laws of reflection, image formation by spherical mirrors and related terminologies, image formation, mirror formula, magnification.

Refraction of light, optical density and refractive index, laws of refraction, Snell's law.

Refraction of light by spherical lens, image formed by spherical lenses, lens formula, magnification, power of a lens.

Dispersion of light, scattering of light, optical phenomena observed in daily life.

Electricity: Current, Potential difference, Resistance, Ohm's law, Series and parallel combination of Resistance, power, heating effect of current.

Magnetic Effect of Electric Current: Magnetic effect of current, solenoid, Flemings Left and right hand rules, working of electric motor, AC, DC generators and domestic circuit and importance of fuse and earthing.

Sources of Energy: Alternate source of energy, working of devices, harnessing solar, hydro, wind, nuclear, geothermal, ocean and bio energy. The environmental consequences and importance of using non-conventional sources of energy.

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Mathematics

Real Numbers: Euclid's Division Lemma, Fundamental Theorem of Arithmetic, Irrational Numbers, Rational Numbers and Their Decimal Expansions.

Pair of Linear Equations in Two Variables: Algebraic Methods of Solving a Pair of Linear Equations, Substitution Method, Elimination Method, Cross-Multiplication Method, Equations Reducible to a Pair of Linear Equations in Two Variables.

Quadratic Equations: Solution of a Quadratic Equation by Factorisation, Solution of a Quadratic Equation by Completing the Square, Nature of Roots.

Arithmetic Progressions: n th Term of an AP, Sum of First n Terms of an AP.

Triangles: Similar Figures, Similarity of Triangles, Criteria for Similarity of Triangles, Areas of Similar Triangles, Pythagoras Theorem.

Coordinate Geometry: Distance Formula, Section Formula, Area of a Triangle.

Trigonometry and its Applications: Trigonometric Ratios, Trigonometric Ratios of Some Specific Angles, Trigonometric Ratios of Complementary Angles, Trigonometric Identities, Heights and Distances.

Circles: Tangent to a Circle, Number of Tangents from a Point on a Circle.

Area Related to Circles: Perimeter and Area of a Circle, Areas of Sector and Segment of a Circle, Areas of Combinations of Plane Figures.

Surface Areas and Volumes: Surface Area of a Combination of Solids, Volume of a Combination of Solids, Conversion of Solid from one Shape to another.