

M.L. Syal's Helix Institute

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SCHOLARSHIP cum ADMISSION Test (February Test for XI–Non-Medical)

Duration of Test : 1 hr. 50 minutes

Total Marks of Test : 300

Pattern of Test

- The question paper will be in pen-paper format using OMR sheet at Helix Chandigarh.
- There will be **75** multiple choice objective type questions with single answer.
- Each question carries **4** marks for correct answer.
- (–1) mark will be deducted for incorrect answer.**
- No mark will be awarded/deducted for unattempted questions.

Physics Syllabus (25 questions) Marks : 100

• Light – Reflection and Refraction

Reflection of light by 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.

• Human eye and colourful world

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.

• Electricity

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, Interrelation between P, V, I and 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, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits.

Chemistry Syllabus (25 questions) Marks : 100

• Chemical reactions and equations

Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, endothermic exothermic reactions, oxidation and reduction.

• Acids, Bases and Salts

Definitions in terms of furnishing of H^+ and OH^- ions, General properties, examples and uses, neutralization, 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 & Its 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, soaps and detergents.

Mathematics (25 questions) Marks : 100

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| • Number systems | • Polynomial |
| • Pair of linear equation in two variables | • Quadratic Equations |
| • Arithmetic Progressions | • Triangles |
| • Circles | • Coordinate Geometry |
| • Introduction to Trigonometry | • Trigonometric Identities |
| • Application of Trigonometry (Heights & Distances) | • Areas Related to Circles |
| • Surface Areas and Volumes | • Statistics & Probability |