

## PHYSICS

- Group A** : Newton's Law of motion, force & impulse, Moment of Inertia, Radius of gyration, Theorem of perpendicular & parallel axes, Moment of Inertia of rod, cylinder, disc and sphere, Simple Harmonic Motion.
- Kepler's Laws of planetary motion, Artificial satellites, Elasticity : Hooke's law, Elastic Constants, Viscosity of fluids Poiseuille's equation, Surface Tension, Angle of Contact, Velocity of sound.
- Effect of temperature & pressure on velocity of sound, Vibration of string, Laws of transverse vibration, Longitudinal vibration of strings, Stationary waves in strings and air-column.
- Group B** : Combination of two lenses separated by a distance, Power of a lens, Spherical aberration and chromatic aberration, Interference of light, Determination of wave length by a Biprism, Colours of thin films. Newton's rings, Diffraction of light, Fresnel class and Fraunhofer class of diffraction. Diffraction grating, Dispersive power of grating, Zone plate, Polarisation of light, Production and analysis of polarised light, Nicol prism, Circular and Elliptical polarisation, Rotation of plane of polarisation, Scattering of light - colour of the sky.
- Group C** : Measurement of temperature, Maximum and Minimum, Thermometer, Measurement of high temperature and low temperature.
- Expansion of solids and liquids, Coefficients of linear and cubical expansion, Apparent and absolute expansion of a liquid. Expansion of gases, Gas laws, Coefficient of increase of pressure at constant volume, Coefficient in increase of volume at constant pressure.
- Calorimetry.
- Two specific heats of gases.
- Change of state, Latent heat of fusion and vaporisation, Kinetic theory of gases, Perfect gas laws, Rootmean square velocity, Relation between heat and work, First law of thermodynamics, Second Law of thermodynamics, Carnot's cycle, Clausius and Clapeyron's equation, Heat Engines, petrol Engine, Diesel Engine.
- Group D** : Ohm's Law (Electricity and Magnetism) Kirchhoff's Laws, Application of Kirchhoff's Laws, Platinum Resistance, Thermometer - temperature, measurement, Thermo-electricity, Peltier and Thomson effect, Thermocouples and measurement of temperature, Chemical effects of current, Electrolysis, Electromagnetic, Induction, Self and Mutual Induction. Varying currents, Growth and Decay of currents, Energy stored up in a circuit.
- Alternating current, Virtual current, R.M.S. value of current, Peak value of current, virtual volt, Impedance, Reactance, Wattless current.
- Group E** : Cathode Rays, Velocity and  $e/m$  of electron, Milikan's oil drop experiment CRT, X-rays production and properties, Application of X-rays, Bohr's theory of hydrogen spectra, Photo-electric effect and Einstein's explanation, Radio-activity, Decay constant, Half-life, Mean life, Isobar and Isotopes, Cyclotron.
- Electromagnetic radiation, Valves - Diode and Triode, Amplification factor, Rectifiers, Zeeman effect, Raman effect, Cosmic Rays.