



IERT EXAM SYLLABUS [PHYSICS]



PHYSICS

A. MEASUREMENTS

1. Fundamental units: Fundamental quantities, S.I. system of fundamental units, standard meter, standard kilograms, standard second, micron, Angstrom & light years, derived units.
2. Measurements of small length: Principal of vernier calipers & screw gauge and its applications, limit of accuracy of measurement, significant figures.

B. KINEMATICS:

1. Elementary Knowledge of Vectors:
Distance & displacement, speed & velocity, representation of vector, addition of vectors (triangle & polygon method-only force diagram).
2. Acceleration
Equation of motion under gravity (straight line).

C. MECHANICS:

1. Laws of Motion – Newton's law of motion, first law, second law of motion (force mass acceleration), unit of force (Newton & Kilogram weight), law of conservation of momentum, third law of motion.
2. Moment of Force – Moment of force and its unit, principal of moments, equilibrium of a body under the system of parallel forces, center of gravity, condition of stable, unstable and neutral equilibrium.

D. WORK, POWER & ENERGY:

Work, Power, Energy and its units (Joule, Watt), definition of energy, kinetic energy, potential energy (examples of elastic, gravitational and electrical energy), Transformation of energy and its relation with work, conservation of mechanical energy, different forms of energy (including mass and energy relation).

E. HYDRO-STATICS:

Pressure in liquids & its dependence on density & depth, unit of pressure, laws of liquid pressure and deduction of Archimedes's principal from it, Floatation up thrust of gases, principal of simple barometer, calculation of atmospheric pressure from the height of mercury column, practical application.

F. VIBRATION:

1. Periodic motion, time period, frequency, amplitude, characteristics of simple harmonic motion (No mathematical derivation).
2. Wave Motion & Sound - **Formation** of wave and its mechanism of propagation, Transverse and Longitudinal waves, wave length, speed of wave, relation between frequency of infrasonic & ultrasonic, general idea about electro-magnetic waves (gamma rays, X-rays, ultrasonic rays, visible light, infrared radiation, sources of radio waves and it's simple example of application).

PDF@ Sarkari Naukri Exams.com

G. HEAT KINETIC THEROY OF MATTER:

1. Kinetic model of gases (no mathematical derivation). Explanation of the pressure of gases on the basis of kinetic theory, concept of temperature, relation between the pressure, volume and temperature of gases, ideal gas equation.
2. Thermal Expansion - Coefficient of thermal expansion of solid, liquid and gases, practical application of thermal expansion, liquid thermometer. Temperature scales (Celsius, Fahrenheit, & Kelvin).
3. Thermal Energy – Concept of internal energy, units of thermal energy (joule calorie). Thermal capacity and specific heat capacity. Latent heat, calorimeter (Principal of mixture, related problems).
4. Thermal Radiation - Dependence of rate of radiation on area, temperature & nature of surface, cooling curve, emissivity and its need.

H. LIGHT:

1. Some facts about light - Mutual independence of light rays, deviation from rectilinear propagation of light, scattering of light, diffused reflection.
2. Reflection of light – Laws of reflection, ray diagram showing the formation of images from spherical mirrors (convex & concave), its size and nature, derivation of mirror formula and its use in numerical problems, linear magnification.
3. Refraction of light on plane surface – Refraction & speed of light, Snell's law, refractive index, refraction on two parallel plane surfaces refraction, deviation, dispersion of light and total reflection in prisms.
4. Refraction through thin lenses – Converging & diverging nature of lenses; first & second principal focus. Ray diagrams showing the formation of images from lenses use of $1/v - 1/u = 1/f$ and its use in numerical problems (No derivation), linear magnification power of lenses and its unit (Diopter).
5. Optical Instruments – Formation of image in human eye power of accommodation, least distance of distinct vision, introduction of lenses as remedy of myopia (Short sightedness); hyper myopia (long sightedness), Photographic camera, slide projector, simple microscope and its magnifying power and arrangement of lenses in compound microscope and astronomical telescope.

I. ELECTROSTATICS:

Atomic model of electrical phenomenon, negative, positive charge and their electron model, difference in conductor and nonconductor (free electron model), electrostatic induction and explanation of conduction in metal on the basis of free electron model.

J. ELECTRICITY:

Simple Circuits – concept of electric current and potential difference, ampere and volt, electric cell, electromotive force, Leclanche cell, Daniell cell and drycell (with chemical reactions), polarization lead accumulator (chemical reaction not required) measurement of current and potential difference, Ohm's law, resistance & dependence of resistance on length of conductor, cross sectional area and nature of conductor specific resistance, combination of resistance in series and parallel, application of equivalent resistance in numerical problems internal resistance in numerical problems related with it. Series and parallel combination of cells.