

PH-111

Physics-I

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UNIT-I**UNITS AND MEASUREMENTS**

Introduction, Need for measurements, system of units, S.I. units, fundamental and derived units. Dimensional formula, dimensional equations and their applications. Error in Physical measurements-causes & types. Combination of errors (qualitative ideas). Numerical Problems. **6Hrs**

VECTOR ANALYSIS

Introduction, Scalars and vectors, Resolution of a vector in a plane, vectors in two and three dimensions, unit vector, rectangular components, laws of vector addition, scalar and vector products. Numerical Problems. **6Hrs**

DESCRIPTION OF MOTION

Introduction, Motion in two dimensions, projectile motion, uniform circular motion (angular frequency, angular velocity, angular acceleration and their correlation with linear motion), qualitative concepts of torque, angular momentum, conservation of angular momentum, centripetal and centrifugal forces. Numerical Problems. **6Hrs**

LAWS OF MOTION

Introduction, Laws of motion, second law is the real law, conservation of linear momentum, Friction and its cause, Static and kinetic friction, self-adjusting nature of friction, laws of limiting friction, rolling friction, angle of friction and angle of repose, methods to reduce friction. Numerical Problems. **6Hrs**

UNIT-II**GRAVITATION**

Introduction, Universal law of gravitation, Inertial and gravitational mass, relation between g and G , variation of acceleration due to gravity (with altitude and depth), orbital velocity, escape velocity, elementary ideas of geo-stationary satellite. Numerical Problems. **6Hrs**

SIMPLE HARMONIC MOTION

Introduction, Periodic motion, simple harmonic motion (S.H.M.) K.E. and P.E. in S.H.M., simple pendulum and oscillations of mass attached to vertical spring. Concepts of seconds pendulum, Wave motion, its kinds and properties, speed, frequency, amplitude, time period and displacement of wave, principle of superposition. Numerical Problems. **6Hrs**

PROPERTIES OF MATTER

Introduction, Inter-atomic and intermolecular forces, elastic properties, Hooke's law, three moduli of elasticity, Poisson's ratio, surface tension and surface energy, angle of contact, capillary rise, Viscosity, Stokes law (treatment by dimensional analysis), Streamline and turbulent flow, Bernoulli's theorem. Numerical Problems. **6Hrs**

HEAT AND THERMODYNAMICS

Introduction, First law of thermodynamics, specific heat at constant volume and constant pressure of ideal gas, relation between C_p and C_v , Thermodynamic processes (reversible, irreversible, isothermal and adiabatic), second law of thermodynamics. Thermal conductivity, black body radiation, Wien's law, Stefan's law, Newton's law of cooling. Numerical Problems. **6Hrs**

Total Theory Load: 48 Hours**Recommended Books:**

1. Fundamental of Physics by Halliday and Resnick and Walker (John Wiley & Sons)
2. Class XI Physics by NCERT
3. abc of Physics, Class (XI) by S. K. Gupta (Modern Publications)
4. Fundamental Physics Class (XI) by K L Gomber and K L Gogia (Pardeep Publications)

C/BOS

7/7/2024

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PH-111 PHYSICS -I (Practical)**List of Experiments**

1. To measure the length, breadth and height of a geometrical body using Vernier Calipers and to find its volume.
2. To measure the diameter of a wire by using a screw gauge and to find its area of cross-section.
3. To measure the radius of curvature of a given lens / mirror by using Spherometer.
4. To determine the density of a given body using physical balance.
5. To determine the area of cross-section of a given small object using Travelling microscope.
6. To determine the value of "g" by Simple Pendulum.
7. To find the coefficient of friction between wood and glass using a horizontal surface.
8. To determine the coefficient of viscosity of glycerin by Stokes method.
9. To determine the surface tension of water using capillary rise method.
10. To determine the force constant/spring constant using Hook's Law.
11. To determine the Young's modulus of the material of a rectangular bar by bending.
12. To determine the value of "g" at a place by using free fall apparatus.

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