Unit-1

1. Write down the dimensional formula for the following quantities
   a) Frequency
   b) Pressure
   c) Power
   d) Force
2. Express 1 Joule into erg.
3. What do you mean by principle of homogeneity?
4. Check the correctness of the following equation by dimensional analysis where the symbols have their usual meanings.

$$T = 2\pi\sqrt{\frac{l}{g}}$$

Unit-2

1. State triangles law of vector addition.
2. State parallelogram law of vector addition.
3. Find $\vec{A}.\vec{B}$ if A= $2\hat{i} + 3\hat{j} - \hat{k}$ and $B = 3\hat{i} - 2\hat{k}$.
4. Explain resolution of vector with a neat diagram.

Unit-3

1. Establish the relation between
   a) Linear velocity and angular velocity
   b) Linear acceleration and angular acceleration.
2. Define projectile. Derive expression for equation of trajectory, maximum height and total time of flight for a projectile fired at an angle θ with horizontal.
3. Define horizontal range of a projectile. Derive an expression for it. What is the condition for maximum range of a projectile? Write expression for the maximum range of a projectile.

Unit-4

1. State laws of limiting friction.
2. Define coefficient of friction.
3. What do you mean by limiting friction?
4. Write different methods to reduce friction.

Unit-5

1. State Newton's law of Gravitation and define G.
2. Distinguish between mass and weight.
3. State Kepler's laws of planetary motion.
4. Establish the relation between G and g.

Unit-6

1. State properties of ultrasonic.
2. State applications ultrasonic.
3. Differentiate between transverse and longitudinal wave.

4. Derive expressions for displacement, velocity and acceleration of a particle executing simple harmonic motion.
5. Establish the relation: $v = n\lambda$.

Unit-7

1. Define latent heat of vaporisation.
2. State any two differences between heat and temperature.
3. Define Joule's Mechanical Equivalent of heat.
4. State first law of thermodynamics.
5. Define the coefficient of Linear, Superficial and Cubical expansion of solids and Establish the relation between α , β and γ .

Unit-8

1. Draw a ray diagram for refraction through a prism.
2. Define critical angle and total internal reflection with diagram. Write down the principle and applications of optical fibre.
3. State laws of refraction.
4. State laws of reflection.

Unit-9

1. Define unit pole.
2. Define magnetic flux density.
3. State coulomb's laws of electrostatics.
4. State coulomb's laws of magnetism.
5. State the properties of Magnetic Lines of Force.
6. Derive a relation between
    a) Farad and stat farad
    b) Farad and ab farad

Unit-10

1. State Kirchhoff's laws and obtain balanced condition of Wheatstone's bridge.
2. Find out the equivalent resistors of which $2\Omega, 3\Omega, 5\Omega$ connected in series and 10Ω , 20Ω are connected in parallel.
3. State Ohm's law.

Unit-11

1. State Fleming's Left hand rule.
2. Derive an expression for force acting on a current carrying conductor placed in a uniform magnetic field. Compare between Fleming's Left hand Rule and Fleming's Right hand Rule.
3. State Lenz's law.
4. State Faraday's Laws of electromagnetic Induction.

Unit-12

1. State properties and applications of Laser.
2. Define population inversion of Laser.