

SECTION – I

2. Write short answers to any EIGHT (8) questions :

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- (i) How many nano-seconds are there in 1 year.
- (ii) Give the drawbacks to use the period of a pendulum as a time standard.
- (iii) What are the dimensions and units of gravitational constant 'G' in the formula $F = \frac{Gm_1 m_2}{r^2}$
- (iv) What is negative of a vector? How a vector \vec{B} is subtracted from a vector \vec{A} ?
- (v) Find the unit vector of the vector $\vec{A} = 4\hat{i} + 3\hat{j}$
- (vi) Can a body rotate about its centre of gravity under the action of its weight?
- (vii) Differentiate between elastic and inelastic collision.
- (viii) What is projectile motion? In what direction acceleration is zero in this motion?
- (ix) Define impulse and show that how it is related to linear momentum.
- (x) Show that 1 kwh = 3.6×10^6 j
- (xi) An object has 1 j of potential energy. Explain what does it mean.
- (xii) Define power. Write its SI unit.

3. Write short answers to any EIGHT (8) questions :

16

- (i) What is meant by moment of inertia? Explain its significance.
- (ii) Explain the difference between tangential velocity and angular velocity.
- (iii) State the direction of the following vectors in simple situation :
(a) Angular momentum, (b) Angular velocity.
- (iv) Explain, how the swing is produced in a fast moving cricket ball.
- (v) Considering Bernoulli's principle, explain the working of a carburetor of a motorcar.
- (vi) Write few lines on blood flow.
- (vii) State Torricelli's theorem.
- (viii) What happens to the period of a simple pendulum if its length is doubled?
- (ix) In relation to SHM, explain the equation : (a) $y = A \sin(\omega t + \phi)$ (b) $a = -\omega^2 x$
- (x) What is the velocity of sound in air, if temperature of air is 20°C ?
- (xi) Is it possible for two identical waves travelling in the same direction along the string to give rise to a stationary wave?
- (xii) Explain the term "Beats".

4. Write short answers to any SIX (6) questions :

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- (i) How can the distance between interference fringes affect by the separation between the slits of Young's experiment? Can fringes disappear?
- (ii) An oil film spreading over a wet footpath shows colours. Explain how does it happen.
- (iii) How would you distinguish between un-polarized and plane-polarized lights?
- (iv) One can buy a cheap microscope for use by the children. The images seen in such a microscope have coloured edges. Why is this so?

(Turn Over)