

Physics (Part-I)
(New Course)

"Section-B"

Marks: 40

Q.2. Write short answers to any ten (10) of the following parts. All parts carry equal marks.

- (i) Explain kinetic energy of rotation.
- (ii) Why is the earth not in thermal equilibrium with the sun?
- (iii) A soap bubble looks black when it bursts, why?
- (iv) Can we apply Huygen's principle to radar waves?
- (v) Why does the speed of a sound wave in a gas changes with temperature?
- (vi) What is the difference between progressive and stationary waves?
- (vii) What will be the frequency of a simple pendulum if its length is '1 m'?
- (viii) Why do the golf balls have dimples?
- (ix) Why is a rifle barrel 'rifled'?
- (x) What type of energy is stored in the spring of watch?
- (xi) Will you release an inflated but untied balloon, why does it fly across the room?
- (xii) What units are associated with unit vector $\hat{i}$, $\hat{j}$ and $\hat{k}$?
- (xiii) What is least count error? How can least count error be reduced?

"Section-C"

Marks: 27

Note: - Answer any three (3) questions. All questions carry equal marks.

- Q.3. (a) How are vectors added and subtracted geometrically? (5)
- (b) Helicopter is ascending vertically at a speed of 19.6 ms^{-1} . When it is at a height of 156.8 m above the ground, a stone is dropped. How long does the stone take to reach the ground? (4)
- Q.4. (a) Describe briefly various non-conventional sources of energy. (5)
- (b) A 2 kg mass swings in a circle of radius 50-cm at the end of a light rod. What resultant torque is required to give an angular acceleration of 2.5 rad/s^2 . (4)
- Q.5. (a) Derive mathematical expression for the Bernoulli's equation. (5)
- (b) A force of 0.4 N is required to displace a body attached to a spring through 0.1 m from its mean position. Calculate the spring constant of spring. (4)
- Q.6. Write notes on any two of the following. All carry equal marks. (9)
- (i) Refrigerator.
 - (ii) Orbital velocity.
 - (iii) Bragg's Law.