

# MODEL PAPER-1

Time : 3Hrs.

PHYSICS

Max.Marks : 60

## SECTION - A

Answer all questions.

Each question carries 2 marks.

All are very short answer type questions.

10 × 2 = 20 Marks.

1. The vertical component of a vector is equal to its horizontal component. What is the angle made by the vector with X-axis?
2. Keeping the length of a simple pendulum constant, will the time period be the same on all planets? Support your answer with reasons.
3. Why a heat engine with 100% efficiency can never be realized in practice?
4. What is the discovery of C.V. Raman?
5. Define Mean Free Path.
6. Distinguish between accuracy and precision.
7. What is specific gas constant? Is it same for all Gases?
8. Why are spokes provided in a bicycle wheel?
9. What is the principle behind the carburetor of an automobile?
10. A body freely falling from a certain height 'h' after striking a smooth floor rebounds and rises to a height  $\frac{h}{2}$ . What is the coefficient of restitution between the floor and the body?

## SECTION - B

Answer any six questions.

Each question carries 4 marks.

All are short answer type questions.

6 × 4 = 24 Marks.

11. What is Orbital velocity? Obtain an expression for it?
12. Describe the behavior of a wire under gradually increasing load.
13. Explain hydraulic lift and hydraulic brakes.
14. Can the equations of kinematics be used when the acceleration varies with time? If not, what form would these equations take?
15. State parallelogram law of vectors. Derive an expression for the magnitude and direction of the resultant vector.
16. Pendulum clocks generally go fast in winter and slow in summer. Why?
17. Define the terms momentum and impulse. State and explain the law of conservation of linear momentum. Give its examples.
18. How much steam at  $100^{\circ}\text{C}$  is to be passed into water of mass 100gm at  $20^{\circ}\text{C}$  to raise its temperature by  $5^{\circ}\text{C}$ ? (Latent heat of steam is 540 cal/gm and specific heat of water is 1cal / gm $^{\circ}\text{C}$ )

## SECTION - C

Answer any two of the following.

Each question carries 8 marks.

All are long answer type questions.

8 × 2 = 16 Marks.

19. a) State Newton's second law of motion. Hence derive the equation of motion

$F = ma$  from it.

- b) A body is moving along a circular path such that its speed always remains constant. Should there be force acting on the body?
20. Develop the notions of work and kinetic energy and show that it leads work-energy theorem.
21. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is second's pendulum?

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