FIRST REVISION EXAMINATION - 2025

CLASS: 11 **PHYSICS** **Reg.No**

Time : 3.00 Hours **MARKS : 70**

PART – I

15 × 1 = 15

Note: **(i) Answer all the questions**
(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer

1. If the length and time period of an oscillating pendulum have errors of 1% and 3% respectively then the error in measurement of acceleration due to gravity is
   a) 4% *b) 5%* *c) 6%* *d) 7%*
2. With an increase in temperature, the viscosity of liquid and gas, respectively will
   a) increase and increase *b) increase and decrease*
   c) decrease and increase *d) decrease and decrease*
3. Two persons A and B take 2 s and 4 s respectively to lift an object to the same height h, then the ratio of their power is
   a) 1:2 *b) 1:1* *c) 2:1* *d) 1:3*
4. A spring is connected to a mass *m* suspended from it and its time period for vertical oscillation is *T*. The spring is now cut into two equal halves and the same mass is suspended from one of the halves. The period of vertical oscillation is
   a) $T'=\sqrt{2}\,T$ *b)* $T'=\frac{T}{\sqrt{2}}$ *c)* $T'=\sqrt{2T}$ *d)* $T'=\sqrt{\frac{T}{2}}$
5. In which of the following processes, heat is neither absorbed nor released by the system?
   a) adiabatic *b) isobaric* *c) isochoric* *d) isothermal*
6. The centrifugal force appears to exist
   a) only in inertial frames *b) only in rotating frames*
   c) in any accelerated frame *d) both in inertial and non-inertial frames*
7. A sound wave whose frequency is 5000 Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is
   a) 4.30 *b) 0.23* *c) 5.30* *d) 1.23*
8. A ball is thrown vertically downward with a velocity of 20 ms^{-1} from the top of a tower. It hits the ground after some time with a velocity of 80 ms^{-1}. The height of the tower is (take g=10 ms^{-2})
   a) 340 m *b) 320 m* *c) 300 m* *d) 360 m*
9. When a uniform rod is heated, which of the following quantity of the rod will increase
   a) mass *b) weight* *c) center of mass* *d) moment of inertia*
10. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along,
    a) a line perpendicular to the plane of rotation
    b) the line making an angle of 45° to the plane of rotation
    c) the radius
    d) tangent to the path
11. In a given progressive wave $y = 5\,sin(100\pi t - 0.4\pi x)$ what is the wave velocity?
    a) 350 *b) 250* *c) 200* *d) 180*
12. If a particle has negative velocity and negative acceleration, its speed
    a) Increases *b) Decreases* *c) Remains same* *d) Zero*
13. If the temperature and pressure of a gas is doubled the mean free path of the gas molecules
    a) remains same *b) doubled* *c) tripled* *d) quadrapoled*
14. Moment of inertia of a ring about its diameter is I. The moment of inertia of the same ring about an axis passing through the centre and perpendicular to its plane is
    a) $\frac{I}{2}$ *b) 2I* *c)* $\frac{I}{4}$ *d) 4I*
15. An object of mass 10 kg is hanging on a spring scale which is attached to the roof of a lift. If the lift is in free fall, the reading in the spring scale is
    a) 98 N *b) Zero* *c) 49 N* *d) 9.8 N*

PART – II

$6 \times 2 = 12$

Answer any six questions. Question no. 23 is compulsory:

16. Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional analysis method.
17. What is non uniform circular motion?
18. What are the forces acting on the vehicle moving in a leveled circular road?
19. Define gravitational potential.
20. How will you distinguish between stable and unstable equilibrium?
21. State Bernoulli's theorem.
22. 'An object contains more heat' – is it a right statement? If not why?
23. A simple pendulum is hung in a very high building oscillates to and fro motion freely like a simple harmonic oscillator. If the acceleration of the bob is 16 ms^{-2} at a distance of 4 m from the mean position, then calculate the time period.
24. Write two characteristics of progressive waves?

PART – III

$6 \times 3 = 18$

Answer any six questions. Question no. 29 is compulsory:

25. What are the limitations of dimensional analysis?
26. Discuss the properties of vector product
27. Derive an expression for energy of a satellite.
28. Obtain the relation between angular momentum and angular velocity.
29. A bullet of mass *50 g* is fired from below into a suspended object of mass *450 g*. The object rises through a height of *1.8 m* with bullet remaining inside the object. Find the speed of the bullet. Take $g = 10\ ms^{-2}$
30. Write a note on impacts of root mean square speed in nature.
31. List out the applications of viscosity.
32. A student comes to school by a bicycle whose tire is filled with air at a pressure *240 kPa* at *27°C*. She travels 8 km to reach the school and the temperature of the bicycle tire increases to *39°C*. What is the change in pressure in the tire when the student reaches school?
33. State the laws of simple pendulum.

PART – IV

$5 \times 5 = 25$

Answer all the questions:

34. a) Write a note on triangulation method and radar method to measure larger distances.

(or)

b) Derive an expression for the elastic energy stored per unit volume of a wire.

35. a) Explain the need for banking of tracks.

(or)

b) What is meant by angular harmonic oscillation? Compute the time period of angular harmonic oscillation.

36. a) Explain in detail Newton's law of cooling.

(or)

b) Derive the equation of motion, range and maximum height reached by the particle thrown at an oblique angle θ with respect to the horizontal direction.

37. a) Derive an expression for escape speed.

(or)

b) Derive an expression of pressure exerted by the gas on the wall of the container.

38. a) Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace correction.

(or)

b) State and explain work energy principle. Mention any three examples for it.