SECOND REVISION TEST - 2025

A

Standard XI

Reg.No.

PHYSICS

Time : 3.00 hrs *Marks : 70*

Part - A

15 x 1 = 15

I. **Choose the correct answer:**

1. Which of the following pairs of physical quantities have same dimension?
   a) Force and power b) Torque and energy
   c) Torque and power d) Force and Torque
2. A particle undergoes uniform circular motion. The angular momentum of the particle remain conserved about
   a) The centre point of the circle
   b) The point on the circumference of the circle
   c) Any point inside the circle
   d) Any point outside the circle
3. A spring of force constant k is cut into two pieces such that one piece is double the length of the other. Then the long piece will have a force constant of
   a) $\frac{2}{3}k$ b) $\frac{3}{2}k$ c) 3k d) 6k
4. Which one of the following physical quantities cannot be represented by a scalar?
   a) Mass b) Length c) Momentum d) Magnitude of acceleration
5. Force acting on the particle moving with constant speed is
   a) Always zero b) Need not be zero
   c) Always non zero d) Cannot be concluded
6. The damping force of an oscillator is directly proportional to velocity. The unit of constant of proportionality is
   a) kg ms^{-1} b) kg ms^{-2} c) kg s^{-1} d) kg s
7. 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
8. The wettability of a surface by a liquid depends primarily on
   a) Viscosity
   b) Surface tension
   c) Density
   d) Angle of contact between the surface and the liquid
9. Work done by the Sun's gravitational force on Earth is
   a) Always zero b) Always positive
   c) Can be positive or negative d) Always negative
10. Identity the state variables given here
    a) Q, T, W b) P, T, U c) Q, W d) P, T, Q
11. Kinetic energy of the satellite orbiting around the Earth is
    a) Equal to potential energy b) Less than potential energy
    c) Greater than kinetic energy d) Zero
12. When a uniform rod is heated, which of the following quantity of the rod will increase?
    a) Mass b) Weight c) Centre of mass d) Moment of inertia

13. Joule's mechanical equivalent of heat is 1 Cal = _____.
    a) 4186 J b) 41.86 J c) 4.186 J d) 0.4186 J
14. Which of the following represents a wave
    a) $(x - vt)^3$ b) $x(x + vt)$ c) $\frac{1}{(x+vt)}$ d) $\sin(x + vt)$
15. Total energy of conservative force
    a) Increases b) Decreases c) Zero d) Remains constant

Part - B

II. Answer any 6 questions. (Q.No.24 is compulsory) **6 x 2 = 12**

16. State the principle of homogeneity of dimensions.
17. Write down the kinematic equations for angular motion.
18. Under what condition will a car skid on a levelled circular road?
19. Define co-efficient of restitution.
20. What are polar satellites?
21. Define Poisson's ratio.
22. How do you distinguish between stable and unstable equilibrium?
23. What is Doppler effect?
24. 500 gm of water is heated from 30°C to 60°C. Ignoring the slight expansion of water, calculate the change in internal energy of the water. (Specific heat of water 4184 j/kg k)

Part - C

III. Answer any 6 questions. (Q.No.33 is compulsory) **6 x 3 = 18**

25. Write any 6 properties of scalar product of vectors.
26. What is a free body diagram? Give the systematic steps to be followed for developing the free body diagram.
27. Derive the relation $KE = \frac{p^2}{2m}$ between momentum and kinetic energy.
28. Explain the propagation of errors in the sum of two quantities.
29. Explain the variation of 'g' with altitude.
30. Derive the expression for efficiency of a carnot engine.
31. Define mean free path. List the factors affecting mean free path.
32. Explain Resonance and give an example.
33. A mobile phone tower transmits a wave signal of frequency 900 MHz. Calculate the length of the waves transmitted from the mobile phone tower.

Part - D

IV. Answer all the questions. **5 x 5 = 25**

34. a) Derive the kinematic equations of motion for constant acceleration. *(OR)*
    b) How will you determine the velocity of sound using Resonance column apparatus?
35. a) Explain the motion of blocks connected by a string in vertical motion. *(OR)*
    b) Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamline flow.
36. a) Compare translational and rotational motion about a fixed axis. *(OR)*
    b) Derive an expression for energy of a satellite.
37. a) State and explain in detail Newton's law of cooling. *(OR)*
    b) State and explain Work-Energy principle.
38. a) Give the uses and limitations of dimensional analysis. *(OR)*
    b) Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecules.

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