SUBLECT: PHYSICS
Class : 11th
MAXIMUM MARKS: 70
TIME :3 Hrs

A. Very Short Answer Type Questions (1x5)

1. If $X=5t^2$ Calculate velocity.
2. Draw X-t graph for free fall.
3. Define the term phase.
4. If Y=4 Sin (5t). Give values of amplitude & angular velocity.
5. What is dimensional formula for specific heat?
6. Define following units.
   I) Light Year II) Par-Sec.
   Or
   Define terms
   I) Absolute error II) Relative error.
7. Derive V=u+at by calculas method.
8. Steel is more elastic than rubber. Explain.
9. What is First law of thermodynamics? Explain sign convention also.
10. What is radius of gyration? Give an expression for it.

B. Short Answer Type Questions (3x12)

11. Derive an expression for angle of banking on a curved road with certain co-efficient of friction.
    Or
    What are laws of friction?
12. Differentiate X^n by ab-initio method.
13. Derive an expression for the time period of simple pendulum using dimensional analysis.
14. What is impulse momentum theorem?
15. What is co-efficient of resituating? How it explains elastic and inelastic collision?
16. Show that total mechanical energy remains constant when a body is dropped from some height.
17. What is kinetic interpretation of temperature? Derive Kinetic energy in terms of temperature.
18. Calculate degrees of freedom for:
    a) Monatomic b)Di atomic gas
19. Differentiate longitudinal & transverse waves with example.
20. Derive expression for escape velocity.

(Use law of conservation of energy)

21. Calculate the change in the value of acceleration due to gravity when a body is taken from surface to height "h".
22. What is Isochoric and isobaric process?
    Write ist law of thermodynamic equation for all these processes.

C. Value –Based Questions (1x4)

23. If m_1 and m_2 are the masses constituting the rigid body, bound by some internal forces so that the distance between the masses remain constant then
    I) Define centre of mass.
    II) Derive expression for position vector of centre of mass.

D. Long-Answer Type (3x5)

24. Derive the expression for path/trajectory time of flight (T) and horizontal range(R) when a body is projected from a certain height in the direction of horizontal.

    Or

    What is centripetal acceleration? Derive expression for it?
25. Discuss S.H.M as a special case of circular motion and derive the expression for displacement and velocity of a body executing S.H.M

    Or

    Derive the expression for the displacement of a transverse progressive wave.
26. Discuss and derive Bernoulli's equation.

    Or

    What are the modes of heat transfer? Discuss
    I) Conduction II) Convection & Radiation