Time: 3 Hours

Max.marks:60

Section – A

Answer all questions, each carry two marks.   **10x2 =20marks**

1. What is the discovery of C.V.Raman?

2. Write the dimensional formulae for the following quantities.

   1. Gravitational constant   2. Surface Tension

3. A ball falls freely from a height 1m on the ground and rebounds to a height of o.8m. Find the coefficient of restitution.

4. Distinguish between centre of mass and centre of gravity.

5. What are the theoretical and practical limits of Poisson's ratio?

6. Find the excess pressure inside a liquid drop?

7. Hot liquids flow faster than cold liquids? Explain.

8. What is the specific heat of a gas in a) an isothermal change and b) an adiabatic change?

9. State the conditions under which Newton's law of cooling is applicable?

10. What is Greenhouse effect?

Section – B

Answer any six questions

Each carry four marks   **6x4= 24 Marks**

11. State parallelogram law of vector addition and derive an expression for its magnitude.

12. A stone is dropped from a height of 300m and at the same another stone is projected vertically upwards with a velocity of 100ms^{-1}. Find when and where the two stones meet?

13. Show that two equal masses undergo oblique elastic collision will move at right angles to each other after collision.

14. Obtain an expression for the acceleration of a body moving down a rough inclined plane.

15. State and prove parallel axes theorem.

16. What is escape velocity? Obtain an expression for it.

17. Define the coefficients of real expansion and apparent expansion of liquid. Establish a relation between them?

18. Define two molar specific heats of gas , and deduce the relation between them.

Section – C

Answer any two questions

Each carry eight marks   8x2=16 Marks.

19. State law of conservation of energy and prove it in the case of a freely falling body.

    If $V = 3i+4j+5k$ ms^{-1} is the instantaneous velocity of a body of mass 1.5 kg, calculate its kinetic energy.

20. Show that the motion of simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?

21. State Newton's law of cooling and describe an experiment to verify the Newton's law of cooling.

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