SECTION – A   [10X2=20M]

NOTE: (i) Answer all questions.
       (ii) Each question carries two marks.
       (iii) All are very short answer type questions.

1. What is the discovery of C.V.Raman?
2. A Vehicle travels half the distance L with speed V_1 and the other half with speed V_2 . What is the average speed?
3. A vector **v** makes an angle with the horizontal.The vector is rotated through an angle θ .Does this rotation change the vector **v** ?
4. A horse has to pull harder during the start of the motion than later. Explain.
5. State the conditions under which a force does no work.
6. What is difference in the positions of a girl carrying a bag in one of her hands and another girl carrying a bag in each of her two hands?
7. "Hydrogen is in abundance around the sun but not around earth". Explain.
8. A tungsten wire of length 20cm is stretched by 0.1cm. Find the strain on the wire.
9. Define average pressure. Mention it's unit and dimensional formula. Is it a scalar or a vector?
10. Find the increase in temperature of aluminium rod if its length is to be increased by 1%. (α for aluminium $= 25 \times 10^{-6} / {}^{0}c$)

<div align="center">

SECTION – B   [6X4=24M]

</div>

NOTE: (i) Answer any six of the following questions.

(ii) Each question carries four marks.

(iii) All are short answer type questions.

11. Show that the maximum height and range of a projectile are $\dfrac{U^2 \sin^2 \theta}{2g}$

and $\dfrac{U^2 \sin 2\theta}{g}$ respectively where the terms have their regular meanings.

12. Explain the terms limiting friction, dynamic friction and rolling friction.

13. A lorry and a car moving with the same momentum are bought to rest by the application of brakes, which provide equal retarding forces. Which of them will come to rest in shorter time? Which will come to rest in less distance?

14. What is orbital velocity? Obtain an expression for it.

15. Define strain energy and derive the equation for the same.

16. State Pascal's law and verifty it with the help of an experiment.

17. Explain conduction, convection and radiation with examples.

18. Four molecules of a gas have speeds 1,2,3 and 4 km/s. Find the rms speed of the gas molecule.

SECTION – C   [2X8=16M]

NOTE: (i) Answer any two of the following questions.
   (ii) Each question carries eight marks.
   (iii) All are long answer type questions.

19. State and prove the principle of conservation of angular momentum. Explain the principle of conservation of angular momentum with examples.
20. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is the length of a simple pendulum which ticks seconds ?
21. State second law of thermodynamics. How is heat engine different from a refrigerator?