Total No. of Questions – 21   Regd.

Total No. of Printed Pages – 2   No.

Part - III
PHYSICS, Paper – I
(English Version)

Time : 3 Hours]   **[Max. Marks : 60**

SECTION – A $10 \times 2 = 20$

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 Sir. C.V. Raman ?

2.   The percentage error in the mass and speed are 2% and 3% respectively. What is the maximum error in kinetic energy ?

3. $\bar{A} = \bar{i} + \bar{j}$. What is the angle between the vector and X-axis ?

4.   Why does the car with a flattened tyre stop sooner than the one with the inflatted tyres ?

5.   Define Average Pressure. Mention its unit.

6.   What are water proofing agents and water wetting agents ?

7.   State Newton's law of cooling.

8.   Ventilators are provided in rooms just below the roof. Why ?

9.   Define mean free path.

10.   State Boyle's law and Charles's law.

Note :   (i)   Answer any **six** questions.

(ii)   Each question carries **four** marks.

(iii)   **All** are short answer type questions.

11.   A car moving along a straight high way with speed of 126 km/h is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform) and how long does it take for the car to stop ?

12.   State parallelogram law of vectors. Derive an expression for the magnitude and direction of the resultant vector.

13.   Define the terms momentum and impulse. State and explain the law of conservation of linear momentum. Give examples.

14.   Define vector product. Explain the properties of a vector product with two examples.

15.   The moment of inertia of a flywheel making 300 revolutions per minute is 0.3 kgm². Find the torque required to bring it to rest in 20 s.

16.   What is a Geostationary Satellite ? State it uses.

17.   Describe the behaviour of a wire under gradually increasing load.

18.   Explain conduction, convection and radiation with examples.

SECTION – C   2 × 8 = 16

Note :   (i)   Answer any **two** questions.

(ii)   Each question carries **eight** marks.

(iii)   **All** are long answer type questions.

19.   What are collisions ? Explain the possible types of collisions ? Show that in the case of one dimensional elastic collision, the relative velocity of approach of two colliding bodies before collision is equal to the relative velocity of separation after collision.

20.   Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. The mass and radius of a planet are double that of the earth. If the time period of a simple pendulum on the earth is T, find the time period on the planet.

21.   Describe the working of Carnot engine. Obtain an expression for the efficiency.
A refrigerator is to maintain eatables kept inside at 9° C. If room temperature is 36° C, calculate the coefficient of performance.