

Total No. of Questions – 21

Regd.

Total No. of Printed Pages – 2

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

Time : 3 Hours /

/ Max. Marks : 60

**SECTION – A**

10 × 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 C.V. Raman ?
2. The error in measurement of radius of a sphere is 1%. What is the error in the measurement of volume ?
3. The vertical component of a vector is equal to its horizontal component. What is the angle made by vector with X-axis ?
4. What is inertia ? What gives the measure of inertia ?
5. What is the principle behind the carburettor of an automobile ?
6. Give the expression for the excess pressure in an air bubble inside the liquid ?
7. What are the lower and upper fixing points in Celsius and Fahrenheit scales ?
8. Why gaps are left between rails on a railway track ?
9. Define mean free path.
10. When does a real gas behave like an ideal gas ?



- Note :** (i) Answer any **six** questions.  
 (ii) Each question carries **four** marks.  
 (iii) **All** are short answer type questions.

11. A man walks on a straight road from his home to a market 2.5 km away with a speed of  $5 \text{ kmh}^{-1}$ . Finding the market closed, he instantly turns and walks back home with a speed of  $7.5 \text{ kmh}^{-1}$ . What is the (a) magnitude of average velocity and (b) average speed of the man over the time interval 0 to 50 minutes ?
12. Explain the terms the average velocity and instantaneous velocity. When they are equal ?
13. State Newton's second law of motion. Hence derive the equation of motion  $F = ma$  from it.
14. Define angular velocity ( $\omega$ ). Derive  $v = r\omega$ .
15. Define angular acceleration and torque. Establish the relation between angular acceleration and torque.
16. What is escape velocity ? Obtain an expression for it.
17. Define stress and explain the types of stress.
18. Explain conduction, convection and radiation with examples.

### SECTION - C

**$2 \times 8 = 16$**

- Note :** (i) Answer any **two** questions.  
 (ii) Each question carrier **Eight** marks.  
 (iii) **All** are long answer type questions.

19. What are collisions ? Explain the possible types of collisions, develop the theory of one dimensional elastic collision.
20. Define simple harmonic motion. Show that the motion of (point) projection of a particle performing uniform circular motion, on any diameter, is simple harmonic.  
 On an average a human heart is found to beat 75 times in a minute. Calculate its frequency and period.
21. State Second law of thermodynamics. How is heat engine different from a refrigerator ?