

**119****III**

Total No. of Questions – 21

Regd.

Total No. of Printed Pages – 2

No.

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

Time : 3 Hours ]

[ Max. Marks : 60

**SECTION – A**

**Note :** (i) Answer **all** questions.**10 × 2 = 20**(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 ?

## SECTION - B

6 × 4 = 24

- 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

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

2 × 8 = 16

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?