119 **I**

Total No. of Questions - **21**
Total No. of Printed Pages - **3**

Regd. No.

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

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

Note :- Read the following instructions carefully.

(i) Answer all the questions of Section-A. Answer any six questions in Section-B and answer any two questions in Section-C.

(ii) In Section-A, questions from Sr. Nos. 1 to 10 are Very Short Answer Type. Each question carries two marks. Answer all questions at one place in the same order.

(iii) In Section-B, questions from Sr. Nos. 11 to 18 are of Short Answer Type. Each question carries four marks.

(iv) In Section-C, questions from Sr. Nos. 19 to 21 are of Long Answer Type. Each question carries eight marks.

SECTION – A **10×2=20**

Note :- Answer all questions :

1. Which of the following has symmetry
   (a) Acceleration due to gravity
   (b) Law of gravitation

2. The error in measurement of radius of a sphere is 1%. What is the error in the measurement of volume?

3. State Boyle's Law and Charles Law.

4. What is the acceleration of a projectile at the top of its trajectory?

5. If a bomb at rest explodes into two pieces, the pieces must travel in opposite directions. Explain.

6. What is the pressure on a swimmer 10m below the surface of a lake? ($g = 10m/sec^2$)

7. Define Viscosity. What are its units and dimensions?

8. What is latent heat of fusion?

9. The roof of buildings are often painted white during summer. Why?

10. The absolute temperature of a gas is increased 3 times. What will be the increase in rms velocity of the gas molecule?

SECTION – B

6×4=24

Note :- Answer any six questions :

11. Two balls are projected from the same point in directions 30° and 60° with respect to the horizontal. What is the ratio of their initial velocities, if they (a) attain the same height, (b) have the same range?

12. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.

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

14. Define angular acceleration and torque. Establish the relation between angular acceleration and torque.

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

16. What is a geostationary satellite? State its uses.

17. Define strain and explain the types of strain.

18. Explain conduction, convection and radiation with examples.

SECTION – C

2×8=16

Note :- Answer any two questions.

19. What are collisions? Explain the possible types of collisions. Develop the theory of one-dimensional elastic collision.

20. (a) Show that the motion of a simple pendulum is simple harmonic and hence, derive an equation for its time period. What is second's pendulum?

    (b) What is the length of a simple pendulum, which ticks seconds?

21. Explain reversible and irreversible processes. Describe the working of Carnot engine. Obtain an expression for the efficiency.