119





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. 12 to 18 are of Short Answer Type.

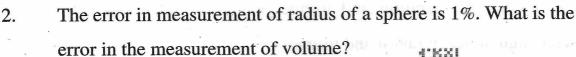
 Each question carries four marks.
- (iv) In Section-C, questions from Sr. Nos. 19 to 21 are of Long Answer Type. Each question carries eight marks.

SECTION - A

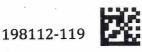
 $10 \times 2 = 20$

Note:- Answer all questions:

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









- 3. State Boyle's Law and Charles Law.
- What is the acceleration of a projectile at the top of its trajectory? 4.
- If a bomb at rest explodes into two pieces, the pieces must travel 5. in opposite directions. Explain.
- What is the pressure on a swimmer 10m below the surface of a 6. lake? $(g = 10 \text{m/sec}^2)$
- Define Viscosity. What are its units and dimensions? 7.
- 8. What is latent heat of fusion?
- The roof of buildings are often painted white during summer. 9. 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



 $6 \times 4 = 24$

Note: - Answer any six questions:

- Two balls are projected from the same point in directions 30° and 11. 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?
- Show that the trajectory of an object thrown at certain angle with 12. the horizontal is a parabola.
- Explain the terms limiting friction, dynamic friction and rolling 13. friction.
- Define angular acceleration and torque. Establish the relation 14. 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

 $2 \times 8 = 16$

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.













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