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▽ III ▽

Total No. of Questions - 21

Total No. of Printed Pages - 2

Regd. No.

Part - III

PHYSICS, Paper - I

(English Version)

Time : 3 Hours　　　　　　　　　　　　　*Max. Marks : 60*

SECTION A　　　　　　　　　$10 \times 2 = 20$

Notes : i)　Answer **all** questions.

　　　　ii)　Each question carries **two** marks.

　　　　iii)　All are **Very Short Answer Type Questions**.

1. What is the contribution of S. Chandra Sekhar to Physics?

2. How can systematic errors be minimized or eliminated?

3. Two forces of magnitudes 3 units and 5 units act at 60^0 with each other. What is the magnitude of their resultant?

4. A batsman hits back a ball straight in the direction of the bowler without changing its initial speed of 12 ms^{-1}. If the mass of the ball is 0.15 kg., determine the impulse imparted to the ball. (Assume linear motion of the ball).

5. Why are drops and bubbles spherical?

6. Define average pressure. Mention its unit.

7. Why gaps are left between rails on a railway track?

8. State Wein's displacement law.

9. Define mean free path.

10. What is the expression between pressure and kinetic energy of a gas molecule?

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SECTION B

6 × 4 = 24

Notes : i) Answer **any six** questions.

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

iii) All are **Short Answer Type Questions.**

11. Two balls are projected from the same point in the directions 30^0 and 60^0 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 a certain angle with the horizontal is a parabola.

13. State Newton's second law of motion. Hence, derive an equation of a motion $F = ma$ from it.

14. Distinguish between centre of mass and centre of gravity.

15. Define vector product. Write the properties of a vector product.

16. What is orbital velocity? Obtain an expression for it.

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

18. In what way is the anomalous behaviour of water advantageous to aquatic animals?

SECTION C

2 × 8 = 16

Notes : i) Answer **any two** questions.

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

iii) All are **Long Answer Type Questions.**

19. Develop the notions of work and kinetic energy and show that it leads to work energy theorem.

20. Show that the motion of a simple pendulum is simple harmonic and hence, derive an equation for its time period. 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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