119

I

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

10×2=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. How can systematic errors be minimised or eliminated ?

3. How is average velocity different from instantaneous velocity ?

4. Give an example where the velocity of an object is zero but its acceleration is not zero.

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

6. According to Newton's third law, every force is accompanied by an equal and opposite force. How can a movement ever take place ?

7. What is magnus effect ?

8. Why are drops and bubbles spherical ?

9. What is latent heat of fusion ?

10. State Newton's law of cooling.

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

12. State Newton's second law of motion. Hence derive the equation of motion $F = ma$ from it.

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

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

15. What is escape velocity ? Obtain an expression for it.

16. Explain the concept of elastic potential energy in a stretched wire and hence obtain the expression for it.

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

18. How specific heat capacity of monoatomic, diatomic gases can be explained on the basis of law of equipartition of energy ?

SECTION C

2×8=16

Note :— (*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.
Consider a drop of mass 1.00 g falling from a height of 1.00 km. What is the work done by the gravitational force ,?
(Take $g = 10\ ms^{-2}$)

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

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