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 contribution of S. Chandrasekhar to Physics ?

2. Distinguish between Accuracy and Precision.

3. When two right-angled vectors of magnitude 7 units and 24 units combine, what is the magnitude of their resultant ?

4. What happens to the coefficient of friction, if the weight of the body is doubled ?

5. What is angle of contact ?

6. Why are drops and bubbles spherical ?

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

8. State Newton's Law of cooling.

9. State Dalton's Law of partial pressures ?

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

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. Distinguish between centre of mass and centre of gravity.
13. What is a Geo-stationary Satellite ? State its uses.
14. Describe the behaviour of a wire under gradually increasing load.
15. State Newton's second law of motion. Hence derive the equation of motion $F = ma$ from it.
16. State the principle of conservation of angular momentum ? Give *two* examples.
17. A stone is dropped from a height 300 m and at the same time another stone is projected vertically upwards with a velocity of 100 m/sec. Find when and where the two stones meet.
18. Write a short note on Triple point of water.

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. State and prove the law of conservation of energy in case of a freely falling body.

    A machine-gun fires 360 bullets per minute and each bullet travels with a velocity of 600 m/s. Of the mass of each bullet is 5 gm, find the power of the machine-gun.
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 second's pendulum on the earth ?
21. State second law of thermodynamics. Describe the working of Carnot engine. Obtain an expression for the efficiency.