0119

A

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 Physics?
2. How can systematic errors be minimised or eliminated ?
3. Two forces of magnitudes 3 units and 5 units act at 60° with each other. what is the magnitude of their resultant?
4. A horse has to pull harder during the start of the motion than later. Explain.
5. What is the principle behind the carburetor of an automobile?
6. Why are drops and bubbles spherical?
7. Distinguish between heat and temperature.
8. Why utensils are coated black ? Why the bottom of the utensils are made of copper?
9. When does a real gas behave like an ideal gas?
10. State Dalton's law of partial pressures

P.T.O.

$6 \times 4 = 24$

SECTION - B

Note: (i) Answer **ANY SIX** questions.
(ii) Each question carries **FOUR** marks.
(iii) All are of short answer type questions.

11. State parallelogram law of vectors. Derive an expression for the magnitude and direction of the resultant vector.
12. Mention the methods used to decrease friction.
13. Distinguish between centre of mass and centre of gravity.
14. Define angular velocity(ω). Derive $v = r\omega$.
15. What is orbital velocity? Obtain an expression for it.
16. In what way is the anomalous behaviour of water advantageous to aquatic animals?
17. A man runs across the roof of a tall building and jumps horizontally on to the (lower)roof of an adjacent building. If his speed is 9 m s^{-1} and the horizontal distance between the buildings is 10 m and the height difference between the roofs is 9 m, will he be able to land on the next building? (take g=10 m s^{-2})
18. Describe the behaviour of a wire under gradually increasing load.

$2 \times 8 = 16$

SECTION - C

Note: (i) Answer **ANY TWO** questions.
(ii) Each question carries **EIGHT** marks.
(iii) All are long answer type questions.

19. State second law of thermodynamics. How is heat engine different from a refrigerator
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. State and prove 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 ms^{-1}. If the mass of each bullet is 5 gm, find the power of the machine gun?