

Total No. of Questions - 21

Regd.

Total No. of Printed Pages - 2

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Part - III
PHYSICS, Paper-I
(English Version)

*Time : 3 Hours /**[Max. Marks : 60]***SECTION - A****Note :** (i) Answer **all** questions.**10 × 2 = 20**(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. When two right angled vectors of magnitude 7 units and 24 units combine, what is the magnitude of their resultant ?
4. A horse has to pull harder during the start of the motion than later. Explain.
5. Why are drops and bubbles spherical ?
6. Mention any two examples that obey Bernoulli's theorem.
7. State Newton's law of cooling.
8. Can a substance contract on heating ? Give an example.
9. State Boyle's law and Charles' law.
10. Define mean free path.

SECTION – B

$$6 \times 4 = 24$$

- 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. A car travels the first third of a distance with a speed of 10 kmph, the second third at 20 kmph and the last third at 60 kmph. What is its mean speed over the entire distance ?
13. Mention the methods used to decrease friction.
14. Distinguish between centre of mass and centre of gravity.
15. Find the centre of mass of three particles at the vertices of an equilateral triangle. The masses of the particles are 100 gram, 150 gram and 200 gram respectively. Each side of the equilateral triangle is 0.5 m long.
16. What is escape 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

- Note :** (i) Answer any **two** questions.
(ii) Each question carries **eight** marks.
(iii) **All** are long answer type questions.

$$2 \times 8 = 16$$

19. 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 m/s. If the mass of each bullet is 5 gm, find the power of the machine gun.
20. Define simple harmonic motion. Show that the motion of point projection of a particle performing uniform circular motion, on any diameter, is simple harmonic. What is the length of simple pendulum, which ticks seconds ?
21. Explain reversible and irreversible processes. Describe the working of Carnot engine. Obtain an expression for the efficiency.