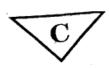
## 0119



Total No. of Questions - **26** Total No. of Printed Pages - **3**  Regd.

## Part - III PHYSICS, Paper - I

(English Version)

Time: 3 Hours

Max. Marks: 60

SECTION - A

10 x 2 = 20

Note: (i) Answer all Questions

- (ii) Each Question carries two marks
- (iii) All are very short answer type questions.
- What is Physics?
- 2. How can systematic errors be minimised or eliminated?
- 3.  $A = \vec{i} + \vec{j}$ . What is the angle between the vector and x-axis?
- 4. Can the coefficient of friction be greater than one?
- 5. Why are drops and bubbles spherical?
- 6. Is it necessary that a mass should be present at the centre of mass of any system?
- 7. What is the principle behind the carburetor of an automobile?
- 8. Why are spokes provided in a bicycle wheel?
- Define mean free path.
- 10. State Boyle's Law and Charles' Law.

## Section - B

Note:

- (i) Answer six questions.
- (ii) Each question carries four marks.
- (iii) All are of short answer type questions.
- 11. Can the velocity of an object be in a direction other than the direction of acceleration of the object? If so, give an example.
- 12. A ball is dropped from the roof of a tall building and simultaneously another ball is thrown horizontally with some velocity from the same roof. Which ball lands first? Explain your answer.
  - Mention the methods used to decrease friction.
  - 14. Distinguish between centre of mass and centre of gravity.
  - 15. What is orbital velocity? Obtain an expression for it.
  - 16. What is a geostationary satellite? State its uses.
  - 17. Describe the behaviour of a wire under gradually increasing load.
  - 18. Pendulum clocks generally go fast in winter and slow in summer.
    Why?
  - 19. State and explain first law of thermodynamics.
  - 20. Compare isothermal and an adiabatic process.
  - 21. Define unit vector, null vector and position vector.
  - 22. If  $|\vec{a} + \vec{b}| = |\vec{a} \vec{b}|$  prove that the angle between  $\vec{a}$  and  $\vec{b}$  is 90°.

Note:

- (i) Answer any two questions.
- (ii) Each question carries eight marks.
- (iii) All are long answer type questions.
- 23 Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?
- 24 State and explain Newton's law of cooling. State the conditions under which Newton's law of cooling is applicable. A body cools down from 60°C to 50°C in 5 minutes and to 40°C in another 8 minutes. Find the temperature of the surroundings.
- Develop the notions of work and kinetic energy and show that it leads to work-energy theorem. https://www.telanganaboard.com

  A machine gun fires 360 bullets per minute and each bullet travels. with a velocity of 600 ms<sup>-1</sup>. If the mass of each bullet is 5 gm, find the power of the machine gunt
- 26. State and prove law of conservation of energy in case of a freely falling body.

A pump is required to lift 600 kg of water per minute from a well 25 m deep and to eject it with a speed of 50 ms<sup>-1</sup>. Calculate the power required to perform the above task.