

**BOARD OF INTERMEDIATE EDUCATION**  
**JUNIOR INTER PHYSICS**  
**MODEL PAPER (ENGLISH VERSION)**

TIME: 3 HOURS

MAX.MARKS: 60

**SECTION – A**

I. i) Very Short Answer Type questions.

ii) Answer ALL questions.

iii) Each question carries TWO marks.

10 × 2 = 20

1. What is the discovery of S. Chandra Sekhar to Physics?
2. How can systematic errors be minimised or eliminated?
3. A vehicle travels half of the total distance with a constant speed ' $V_1$ ' and the remaining half distance with a constant speed ' $V_2$ '. What is its average speed?
4. Can a vector of magnitude zero have non-zero components?
5. Define Force. What are the basic forces in nature?
6. Is it necessary that a mass should be present at the centre of mass of any system?
7. "Hydrogen is in abundance around the Sun but not around the Earth". Explain.
8. Find the increase in temperature of Aluminium rod if its length is to be increased by 1%.  
(For Aluminium  $\alpha = 25 \times 10^{-6} \text{ }^\circ\text{C}^{-1}$ ).
9. Define mean free path.
10. State Boyle's law and Charles' law.

**SECTION – B**

II. i) Short Answer Type questions.

ii) Answer any SIX questions.

iii) Each question carries FOUR marks.

6 × 4 = 24

11. A ball is thrown vertically upwards with a velocity of  $20 \text{ ms}^{-1}$  from the top of a multistorey building. The height of the point from where the ball is thrown is 25 m from the ground.
  - a) How high the ball will rise?
  - b) How long will it be before the ball hits the ground? (Take  $g = 10 \text{ ms}^{-2}$ )
12. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.
13. State Newton's Second law of motion. Hence derive the equation  $F = ma$  from it.
14. Find the torque of a force  $(7\hat{i} + 3\hat{j} - 5\hat{k})$  about the origin when it acts on a particle whose position vector is  $(\hat{i} - \hat{j} + \hat{k})$ .

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. Explain Conduction, Convection and Radiation with examples.
18. State parallelogram law of vectors. Derive an expression for the magnitude and direction of resultant vector of two vectors.

**SECTION – C**

**III. i) Long Answer Type questions.**

**ii) Answer any TWO questions.**

**iii) Each question carries EIGHT marks.**

**$2 \times 8 = 16$**

19. What are collisions? Explain possible types of collisions. Develop the theory of one dimensional elastic collision.
20. Define simple harmonic motion. Show that the motion of (a point) projection of a particle performing uniform circular motion, on any diameter, is simple harmonic.
21. Explain reversible and irreversible processes. Describe the working of Carnot engine. Obtain an expression for its efficiency.