BOARD OF INTERMEDIATE EDUCATION

JUNIOR INTER MODEL PAPER - 2020

Time: 3 Hours **Physics (English Medium)** **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 C.V.Raman?

2. Distinguish between accuracy and precision.

3. $\vec{A} = \vec{i} + \vec{j}$. What is the angle made by the vector with X - axis?

4. When a bullet is fired from a gun, the gun gives a kick in the backward direction. Explain.

5. Why are spokes provided in a bicycle wheel?

6. What is the principle behind the carburettor of an automobile?

7. If the diameter of a soap bubble is 10 mm and its surface tension is 0.04 Nm^{-1}, find the excess pressure inside the bubble.

8. Can a substance contract on heating? Give an example.

9. State Wein's displacement law.

10. The absolute temperature of a gas is increased 3 times. What will be the increase in rms velocity of the gas molecule?

Section – B

II. **i) Short answer type questions.**

ii) Answer any SIX questions.

iii) Each question carries FOUR marks. **(6 × 4 = 24)**

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. Explain advantages and disadvantages of friction.

14. Define angular velocity. Derive $V = r\omega$.

15. Define vector product. Explain the properties of vector product with two examples.

16. What is orbital velocity? Obtain an expression for it.

17. Define strain energy and derive the equation for the same.

18. In what way is the anamolous behaviour of water advantageous to aquatic animals?

Section - C

III. **i) Long answer type questions.**

ii) Answer any TWO questions.

iii) Each question carries EIGHT marks. **(2 × 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 ms^{-1}. If 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 seconds pendulum?

What is the length of a simple pendulum, which ticks seconds?

21. Explain reversible and irreversible processes. Describe the working of a Carnot engine. Obtain an expression for its efficiency.