

Motion and time.

I. Short Answer type questions:

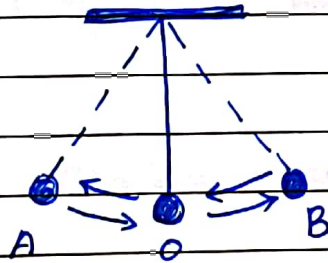
1. Under what condition, the time period of a pendulum does not depend upon the amplitude of oscillation? (pg 188, Q no. 3)

Ans: When the amplitude of oscillations is small, the time period of a pendulum does not depend on it.

II. Higher Order Thinking skills.

1. The bob of a simple pendulum takes 0.25 s to go from one extreme position to the mean position. What is the time period of the pendulum?

Ans:

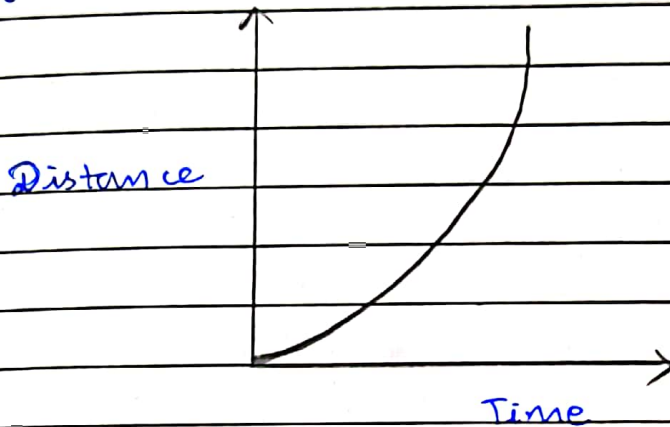


- Time period of the pendulum is the time taken by it to complete one oscillation.
- The pendulum completes one oscillation when its bob, starting from its mean position O, moves to one extreme position to A, then to other extreme position B and then back to mean position O.

$$\therefore \text{Time period of the pendulum} \\ = 0.25 \times 4 = 1 \text{ second}$$

2. Draw the distance-time graph for a honeybee moving around a flower at a speed of 1 m/min . Calculate the distance travelled by it in 0.50 min .

Since the honeybee is moving around the flower in random motion, its distance-time graph will not be a straight line.



$$\begin{aligned}\text{Speed of honey bee} &= 1\text{ m/min} \\ &= \frac{1}{60}\text{ m/s}\end{aligned}$$

$$\text{Time} = 0.50\text{ min} = 30\text{ sec}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\begin{aligned}\text{Distance} &= \text{Speed} \times \text{time} = \frac{1}{60}\text{ m/s} \times 30\text{ sec} = \frac{1}{2}\text{ m} \\ &= 0.5\text{ m} \\ &= 50\text{ cm}\end{aligned}$$

\therefore The honeybee covers a distance of 50 cm in 0.50 minutes .