

Problems Based on Distance And Displacement

VERY SHORT ANSWER TYPE QUESTIONS :

Q.1 Define distance. Is it scalar or vector quantity?

Sol. The total path covered by a body during its motion is called distance. It is a scalar quantity.

Q.2 Define displacement.

Sol. The shortest distance between the initial and final position is called displacement.

Q.3 Give two differences between distance and displacement.

Sol. **Distance :**

(a) The total path covered by a body is called distance.

(b) It is a scalar quantity.

Displacement :

(a) The shortest distance between two points is called displacement.

(b) it is a vector quantity.

Q.4 It is possible that displacement is zero but not the distance?

Sol. Yes. If a body is moving on a circular path then in one complete revolution displacement is zero but distance is equal to perimeter.

Q.5 Under what condition is displacement equal to the distance?

Sol. The displacement equals to distance if the body is moving in a straight line.

Q.6 Is the distance covered by a body always greater than the magnitude of the displacement.

Sol. If the body is not moving in a straight line, the distance is always greater than the magnitude of the displacement.

Q.7 An object is moving along a circular track of radius 2m with uniform speed. What is the ratio of the distance covered and displacement in half revolution?

Sol. In half revolution

$$\text{Distance} = \pi r$$

$$\text{Displacement} = 2r$$

$$\frac{\text{Distance}}{\text{Displacement}} = \frac{\pi r}{2r} = \frac{\pi}{2}$$

$$= 1.57$$

Q.8 Draw displacement time graph for a body at rest.

Sol. For a body at rest the displacement time graph is a straight line parallel to time axis.

