

Worksheet: 3 Subject: - Physics Class: - IX Teacher: - Mrs. Kuljeet Kaur
Name: _____ Class & Sec: _____ Roll No. _____ Date: 01.05.2020

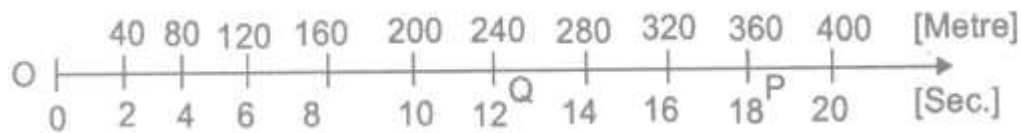
1. When a body covers equal distance in equal intervals of time, its motion is said to be:
(A) Non-uniform (B) Uniform (C) Accelerated (D) Back and forth
2. The motion along a straight line is called:
(A) Vibratory (B) Stationary (C) Circular (D) Linear
3. A particle is traveling with a constant speed. This means:
(A) Its position remains constant as time passes.
(B) It covers equal distance in equal interval of time
(C) Its acceleration is zero
(D) It does not change its direction of motion
4. The rate of change of displacement is:
(A) Speed (B) Velocity (C) Acceleration (D) Retardation
5. Speed is never:
(A) zero (B) Fraction (C) Negative (D) Positive
6. The motion of a body covering different distances in same intervals of time is said to be:
(A) Zig - Zag (B) Fast (C) Slow (D) Variable
7. Unit of velocity is:
(A) ms (B) ms⁻¹ (C) ms² (D) none of these
8. A speed:
(A) is always positive (B) is always negative
(C) May be positive as well as negative (D) is neither zero nor negative
9. A particle moves with a uniform velocity:
(A) The particle must be at rest (B) The particle moves along a curved path
(C) The particle moves along a circle (D) The particle moves along a straight line
10. A quantity has value of -6.0 ms⁻¹. It may be the:
(A) Speed of a particle (B) Velocity of a particle
(C) Position of a particle (D) Displacement of a particle
11. In 10 minutes, a car with speed of 60 kmh⁻¹ travels a distance of:
(A) 6 km (B) 600 km (C) 10 km (D) 7 km
12. A particle covers equal distances in equal intervals of times, it is said to be moving with uniform:
(A) Speed (B) Velocity (C) Acceleration (D) Retardation
13. The SI unit of the average velocity is:
(A) m/s (B) km/s (C) cm/s (D) mm/s

14. Meter per second is not the unit of:

- (A) Speed (B) Velocity (C) Displacement (D) None of them

ILLUSTRATIONS

A car is moving along x-axis. As shown in figure it moves from O to P in 18 s and returns from P to Q in 6 second. What is the average velocity and average speed of the car in going from (i) O to P and (ii) from O to P and back to Q.



Sol. (i) Average velocity = $\frac{\text{path length}}{\text{time interval}} = \frac{360\text{m}}{18} = 20 \text{ ms}^{-1}$

Average speed = $\frac{\text{path length}}{\text{time interval}} = \frac{360\text{m}}{18} = 20 \text{ ms}^{-1}$

(ii) From O to P and back to Q

Average velocity = $\frac{OQ}{18+6} = \frac{240\text{m}}{24} = 10 \text{ ms}^{-1}$

Average speed = $\frac{\text{path length}}{\text{time interval}} = \frac{OP+PQ}{18+6} = \frac{360+120}{24} = 20 \text{ ms}^{-1}$

A car covers the 1st half of the distance between two places at a speed of 40 km h^{-1} and the 2nd half at 60 km h^{-1} . What is the average speed of the car ?

Sol. Suppose the total distance covered is $2S$.

Then time taken to cover first distance with speed 40 km/h ,

$$t_1 = \frac{S}{40} \text{ h}$$

Time taken to cover second S distance with speed 60 km/h ,

$$t_2 = \frac{S}{60} \text{ h}$$

$$V_{\text{av}} = \frac{\text{total distance}}{\text{total time}} = \frac{S+S}{\frac{S}{40} + \frac{S}{60}}$$

$$V_{\text{av}} = \frac{2S}{\frac{3S+2S}{120}} = \frac{2S}{5S} \times 120$$

$$\Rightarrow V_{\text{av}} = 48 \text{ km/h}$$

3. A non-stop bus goes from one station to another station with a speed of 54 km/h , the same bus returns from the second station to the first station with a speed of 36 km/h . Find the average speed of the bus for the entire journey.

Sol. Suppose the distance between the stations is S. Time taken in reaching from one station to another station.

$$t_1 = \frac{S}{54} \text{ h}$$

Time taken in returning back,

$$t_2 = \frac{S}{36} \text{ h}$$

Total t = t₁ + t₂

$$t = \frac{S}{54} + \frac{S}{36} = \frac{2S}{108} + \frac{3S}{108} = \frac{5S}{108} \text{ h}$$

$$\text{Average speed } V_{av} = \frac{\text{Total distance}}{\text{Total time}}$$

$$V_{av} = \frac{2S}{\frac{5S}{216}} \times 108$$

$$V_{av} = 43.2 \text{ km /h}$$