Physics By Manish Raj Sir
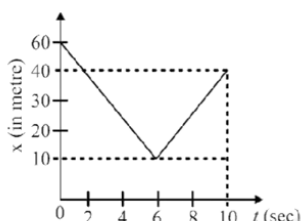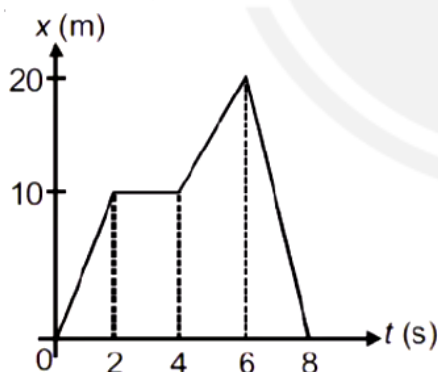
Motion in a Straight Line

Q1 The figure shows the displacement time graph of a particle moving on a straight line path. What is the average velocity of the particle over 10 seconds:

(A) 2 m/s
(B) 4 m/s
(C) 6 m/s
(D) 8 m/s

Q2 The position (x)-time (t) graph for a particle moving along a straight line is shown in figure. The average speed of particle in time interval $t = 0$ to $t = 8$ s is;

(A) Zero
(B) 5 m/s
(C) 7.5 m/s
(D) 9.7 m/s

Q3 A car moves from X to Y with a uniform speed v_u and returns to X with a uniform speed v_d. The average speed for this ground trip is;

(A)
(B) $\sqrt{v_u v_d}$

(C) $\dfrac{\frac{2v_d v_u}{v_d + v_u}}{\frac{v_d v_u}{v_d + v_u}}$
(D) $\dfrac{v_u + v_d}{2}$

Q4 The numerical ratio of average velocity to average speed is:
(A) always less than one
(B) always equal to one
(C) always more than one
(D) equal to or less than one

Q5 What will be the average velocity when a particle completes the circle of radius 5 m in 20 s?
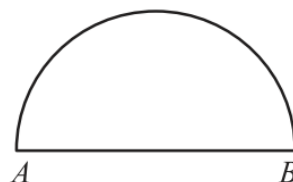(A) 2 m/s
(B) 10 m/s
(C) 3.14 m/s
(D) zero

Q6 A particle is moving such that its position coordinates (x, y) are:
$(2 \text{ m}, 3 \text{ m})$ at time $t = 0$,
$(6 \text{ m}, 7 \text{ m})$ at time $t = 2$ s and
$(13 \text{ m}, 14 \text{ m})$ at time $t = 5$ s

Average velocity vector $\left(\vec{V}_{av} \right)$ from t $= 0$ to t $= 5$ s is:
(A) $\frac{1}{5}\left(13\hat{i} + 14\hat{j} \right)$
(B) $\frac{7}{3}\left(\hat{i} + \hat{j} \right)$
(C) $2\left(\hat{i} + \hat{j} \right)$
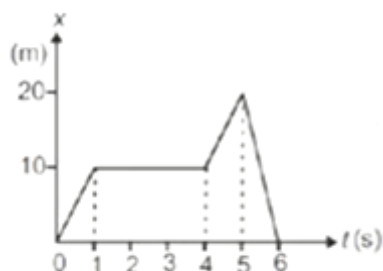(D) $\frac{11}{5}\left(\hat{i} + \hat{j} \right)$

Q7 What is the magnitude of the average velocity of the particle moving on a semi-circle track of radius $5m$ if it takes $2.5s$ to move from A to B?

(A) $1 \text{ } m/s$
(B) $2.5 \text{ } m/s$
(C) $4 \text{ } m/s$
(D) $10 \text{ } m/s$

Q8 Figure shows the graph of x-coordinate of a particle moving along x-axis as a function of time. Average velocity during $t = 0$ to 6 s and instantaneous velocity at $t = 3$ s respectively, will be

(A) $10 \text{ m/s}, 0$

(B) $60 \text{ m/s}, 0$

(C) $0, 0$

(D) $0, 10 \text{ m/s}$

Q9 The relation between time t and displacement x is expressed by $x = 2 - 5t + 6t^2$. What will be the initial velocity of the particle?

(A) -5 m/sec

(B) -3 m/sec

(C) 6 m/sec

(D) 3 m/sec

Q10 A body is moving according to the equation $x = at + bt^2 - ct^3$. Then its instantaneous speed is given by:

(A) $a + 2b + 3ct$

(B) $a + 2bt - 3ct^2$

(C) $2b - 6ct$

(D) None of these

Q11 The displacement of a particle, moving in a straight line, is given by $s = 2t^2 + 2t - 4$ where s is in meters and t in seconds. The acceleration of the particle is

(A) 8 m/s^2 (B) 5 m/s^2

(C) 7 m/s^2 (D) 4 m/s^2

Q12 The displacement of particle is given by

$$x = a_0 + \frac{a_1 t}{2} - \frac{a_2 t^2}{3}$$

What is its acceleration?

(A) $\frac{2a_2}{3}$ (B) $-\frac{2a_2}{3}$

(C) a_2 (D) zero

Q13 Which of the following relations representing displacement x of a particle describes motion with constant acceleration?

(A) $x = 6 - 7t^{-2}$

(B) $x = 3t^2 + 5t^3 + 7$

(C) $x = 9t^2 + 8$

(D) $x = 4t^{-2} + 3t^{-1}$

Answer Key

Q1	(A)		**Q8**	(C)
Q2	(B)		**Q9**	(A)
Q3	(A)		**Q10**	(B)
Q4	(D)		**Q11**	(D)
Q5	(D)		**Q12**	(B)
Q6	(D)		**Q13**	(C)
Q7	(C)			

Master NCERT with PW Books APP