

PHYSICS		
MOTION IN ONE DIMENSION	SPARK & IGNITE	ASSIGNMENT
<p>Q.1 A particle moves along the x-axis in such a way that its x-coordinates varies with time as $x = 2 - 5t + 6t^2$. What will be its initial velocity ? (a) 5 m/s (b) -5 m/s (c) 2 m/s (d) -2 m/s</p> <p>Q.2 The displacement of a particle moving in one-dimensional direction under a force at time t is given $t = \sqrt{x} + 3$, where x is in m and t in sec. The displacement of the particle, when its velocity is zero, will be : (a) 0 (b) 3m (c) -3m (d) 2m</p> <p>Q.3 The displacement x of a particle along a straight line at time t is given by $x = a_0 - a_1t + a_2t^2$. The acceleration of the particle is : (a) a_0 (b) a_1 (c) $2a_2$ (d) a_2</p> <p>Q.4 If the displacement of a particle is proportional to the square of time, then : (a) velocity is inversely proportional to 1 (b) velocity is proportional to t (c) velocity is proportional to \sqrt{t} (d) acceleration is constant</p> <p>Q.5 The displacement is given by $x = 2t^2 + t + 5$, the acceleration at t = 5 sec will be : (a) 8 m/s² (b) 12 m/s² (c) 15 m/s² (d) 4 m/s²</p> <p>Q.6 A particle moves along the x-axis in such a way that its x-coordinate varies with time as $x = 2 - 5t + 6t^2$. The initial velocity and acceleration of particle will respectively be: (a) -5 m/s, 12 m/s (b) 5 m/s, -12 m/s (c) -5 m/s, -12 m/s (d) 5 m/s, 12 m/s</p> <p>Q.7 The position x of a particle varies with time (t) as $x = at^2 - bt^3$. The acceleration of the particle will be equal to zero at time : (a) $\frac{2a}{3b}$ (b) $\frac{a}{b}$ (c) $\frac{a}{3b}$ (d) 0</p> <p>Q.8 The retardation of a moving particle, if the relation between time and position is</p>	<p>$t = Ax^2 + Bx$ (where A and B are constant) will be : (a) $2A(Ax + B)^{-3}$ (b) $2A(2Ax + B)^{-3}$ (c) $A/2(Ax + B)^{-3}$ (d) $A/2[2Ax + B]^{-3}$</p> <p>Q.9 A particle moves along the x-axis in such a way that its x-coordinate varies with time according to the equation $x = 2 - 5t + 6t^2$. The initial velocity and acceleration will respectively be : (a) 5 m/s, 12 m/s² (b) -12 m/s, -5 m/s² (c) 12, -5 m/s² (d) -5 m/s, 12 m/s²</p> <p>Q.10 The position of a body with respect to time is given by $x = 4t^3 - 6t^2 + 20t + 12$. Acceleration at t = 0 will be : (a) -12 units (b) 12 units (c) 24 units (d) -24 units</p> <p>Q.11 At an instant t, the co-ordinates of a particle are $x = at^2$, $y = bt^2$ and $z = 0$, then its velocity at the instant t will be - (a) $t \sqrt{a^2 + b^2}$ (b) $2t \sqrt{a^2 + b^2}$ (c) $\sqrt{a^2 + b^2}$ (d) $2t^2 \sqrt{a^2 + b^2}$</p> <p>Q.12 The displacement y (in meters) of a body varies with time (in seconds) according to the equation $y = -\frac{2}{3}t^2 + 16t + 2$. How long does the body come to rest ? (a) 8 seconds (b) 10 seconds (c) 12 seconds (d) 14 second</p> <p>Q.13 The initial velocity of a particle (at t = 0) is u and the acceleration of particle at time t is given by $f = at$, where a is a constant. Which of the following relation for velocity v of particle after time t is true? (a) $v = u + at^2$ (b) $v = u + at^2/2$ (c) $v = u + at$ (d) None of these</p>	

Q.14 The position x of a particle varies with time (t) as $x = at^2 - bt^3$. The acceleration at time t of the particle will be equal to zero, where t is equal to-

- (a) $\frac{2a}{3b}$ (b) $\frac{a}{b}$ (c) $\frac{a}{3b}$ (d) zero

Q.15 A particle moves along a straight line such that its displacement at any time t is given by $s = t^3 - 6t^2 + 3t + 4$ metres. The velocity when the acceleration is zero is -

- (a) 3 m/s (b) -12 m/s
(c) 42 m/s (d) -9 m/s

Q.16 A car moves along a straight line whose equation of motion is given by $s = 12t + 3t^2 - 2t^3$, where s is in metres and t is in seconds. The velocity of the car at start will be-

- (a) 7 m/s (b) 9 m/s
(c) 12 m/s (d) 16 m/s

Q.17 The x and y co-ordinates of a particle at any time t are given by $x = 7t + 4t^2$ and $y = 5t$, where x and y are in m and t in s. The acceleration of the particle at 5s is-

- (a) zero (b) 8 m/s²
(c) 20 m/s² (d) 40 m/s²

Q.18 The deceleration experienced by a moving motor boat, after its engine is cut off is given by $\frac{dv}{dt} = -kv^3$, where k is constant. If v_0 is the magnitude of the velocity at cut off, the magnitude of the velocity at a time t after the cut-off is-

- (a) $\frac{v_0}{2}$ (b) v_0
(c) $v_0 e^{-k/1}$ (d) $\frac{v_0}{\sqrt{(2v_0^2 kt + 1)}}$

Q.19 The displacement of a particle is given by $y = a + bt + ct^2 - dt^4$

The initial velocity and acceleration are respectively-

- (a) $b, -4d$ (b) $-b, 2c$
(c) $b, 2c$ (d) $2c, -4d$

Q.20 The displacement of a particle is represented by the following equation :

$$s = 3t^3 + 7t^2 + 5t + 8$$

where s is in metre and t in second. The acceleration of the particle at $t = 1$ is-

- (a) 14 m/s² (b) 18 m/s²
(c) 32 m/s² (d) zero

Q.21 The relation $3t = \sqrt{3x} + 6$ describes the displacement of a particle in one direction where x is in meters and t in seconds. The displacement, when velocity is zero, is-

- (a) 24 m (b) 12 m
(c) 5 m (d) zero

Q.22 A force $\vec{F} = 6t^2 \hat{i} + 4t \hat{j}$ is acting on a particle of mass 3kg then what will be velocity of particle at $t = 3$ second and if at $t = 0$, particle is at rest -

- (a) $18\hat{i} + 6\hat{j}$ (b) $18\hat{i} + 12\hat{j}$
(c) $12\hat{i} + 6\hat{j}$ (d) none

Q.23 A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest-

- (a) 24 m (b) 40 m
(c) 56 m (d) 16 m

Q.24 A particle is moving along x -axis has acceleration f , at time t , given by $f = f_0 \left(1 - \frac{t}{T}\right)$, where f_0 and T are constants.

The particle at $t = 0$ has zero velocity. In the time interval between $t = 0$ and the instant when $f = 0$, the particle velocity (v_x) is-

- (a) $\frac{1}{2} f_0 T$ (b) $f_0 T$

(c) $\frac{1}{2}f_0T^2$ (d) f_0T^2

Q.25 The position x of a particle with respect to time t along x -axis is given by $x = 9t^2 - t^3$ where x is in metres and t in seconds. What will be the position of this particle when it achieves maximum speed along the $+x$ direction ?

- (a) 24 m (b) 32 m
(c) 54 m (d) 81 m

Q.26 The motion of a particle along a straight line is described by equations

$$x = 8 + 12t - t^3$$

where x is in metre and t in second. The retardation of the particle when its velocity becomes zero is :

- (a) 6 ms^{-2} (b) 12 ms^{-2}
(c) 24 ms^{-2} (d) zero

Q.27 The displacement of a particle starting from rest (at $t = 0$) is given by $s = 6t^2 - t^3$. The time at which the particle will attain zero velocity again, is-

- (a) 4s (b) 8s (c) 12s (d) 16s

Q.28 The velocity of a body depends on time according to the equation $v = 20 + 0.1 t^2$. The body is undergoing-

- (a) uniform acceleration
(b) uniform retardation
(c) non-uniform acceleration
(d) zero acceleration

Q.29 A particle moves along the x -axis such that its coordinate(x) varies with time (t), according to the expression : $x = 2 - 5t + 6t^2$, where x is in meters and t is in seconds. The initial velocity of the particle is-

- (a) -5 m/s (b) -3 m/s
(c) 6 m/s (d) 2 m/s

Q.30 If for a particle position $x \propto t^2$ then -

- (a) velocity is constant
(b) acceleration is constant
(c) acceleration is variable
(d) none of these

Q.31 Relation between displacement x and time t is $x = 2 - 5t + 6t^2$, the initial acceleration will be -

- (a) -3 m/s^2 (b) 12 ms^2
(c) 2 ms^2 (d) -5 ms^2

Q.32 The displacement ' x ' of a particle moving along a straight line at time t is given by $x = a_0 + a_1t + a_2t^2$. The acceleration of the particle is-

- (a) a_1 (b) a_2 (c) $2a_2$ (d) $3a_2$

Q.33 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

Q.34 If the distance covered by a particle is given by the relation $x = at^2$. The particle is moving with -

- (a) constant acceleration
(b) zero acceleration
(c) variable acceleration
(d) none of these

Q.35 Starting from rest, the acceleration of a particle is $a = 2(t - 1)$. The velocity of the particle at $t = 5\text{s}$ is-

- (a) 15 m/s (b) 25 m/s
(c) 5 m/s (d) None of these

Answer Key

1.	(b)	11.	(b)	21.	(d)	31.	(b)
2.	(a)	12.	(c)	22.	(a)	32.	(c)
3.	(c)	13.	(b)	23.	(d)	33.	(b)
4.	(b,d)	14.	(c)	24.	(a)	34.	(a)
5.	(d)	15.	(d)	25.	(c)	35.	(a)
6.	(a)	16.	(c)	26.	(b)		
7.	(c)	17.	(b)	27.	(a)		
8.	(c)	18.	(d)	28.	(c)		
9.	(d)	19.	(c)	29.	(a)		
10.	(a)	20.	(c)	30.	(b)		