

Time:60 min.

(CLASS +1)

Marks: 100

Motion In One Dimension (Test-4)

Name.....Mobile No.....

- The displacement-time graph for two particles A and B are straight lines inclined at angles of 30° and 60° with the time axis. The ratio of velocities of $V_A : V_B$ is
 (a) 1 : 2 (b) $1 : \sqrt{3}$ (c) $\sqrt{3} : 1$ (d) 1 : 3
- A train has a speed of 60 km/h. for the first one hour and 40 km/h for the next half hour. Its average speed in km/h is
 (a) 50 (b) 53.33 (c) 48 (d) 70
- Which of the following is a one dimensional motion
 (a) Landing of an aircraft (b) Earth revolving a round the sun
 (c) Motion of wheels of a moving trains (d) Train running on a straight track
- A man walks on a straight road from his home to a market 2.5 km away with a speed of 5 km/h. Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km/h. The average speed of the man over the interval of time 0 to 40 min. is equal to
 (a) 5 km/h (b) $\frac{25}{4}$ km/h (c) $\frac{30}{4}$ km/h (d) $\frac{45}{8}$ km/h
- The numerical ratio of displacement to the distance covered is always
 (a) Less than one (b) Equal to one
 (c) Equal to or less than one (d) Equal to or greater than one
- The correct statement from the following is
 (a) A body having zero velocity will not necessarily have zero acceleration
 (b) A body having zero velocity will necessarily have zero acceleration
 (c) A body having uniform speed can have only uniform acceleration
 (d) A body having non-uniform velocity will have zero acceleration
- A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm. How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion?
 (a) 1.5 cm (b) 1.0 cm (c) 3.0 cm (d) 2.0 cm
- The displacement x of a particle along a straight line at time t is given by $x = a_0 + a_1 t + a_2 t^2$. The acceleration of the particle is
 (a) a_0 (b) a_1 (c) $2a_2$ (d) a_2
- An electron starting from rest has a velocity that increases linearly with the time that is $v = kt$, where $k = 2 \text{ m/sec}^2$. The distance travelled in the first 3 seconds will be
 (a) 9 m (b) 16 m (c) 27 m (d) 36 m
- The relation between time and distance is $t = \alpha x^2 + \beta x$, where α and β are constants. The retardation is
 (a) $2\alpha v^3$ (b) $2\beta v^3$ (c) $2\alpha\beta v^3$ (d) $2\beta^2 v^3$
- An elevator car, whose floor to ceiling distance is equal to 2.7 m, starts ascending with constant acceleration of 1.2 ms^{-2} . 2 sec after the start, a bolt begins fallings from the ceiling of the car. The free fall time of the bolt is
 (a) $\sqrt{0.54}$ s (b) $\sqrt{6}$ s (c) 0.7 s (d) 1 s

12. The x and y coordinates of a particle at any time t are given by $x = 7t + 4t^2$ and $y = 5t$, where x and y are in meter and t in seconds. The acceleration of particle at $t = 5$ s is
 (a) Zero (b) 8 m/s^2 (c) 20 m/s^2 (d) 40 m/s^2
13. A car, moving with a speed of 50 km/hr , can be stopped by brakes after at least 6m . If the same car is moving at a speed of 100 km/hr , the minimum stopping distance is
 (a) 6m (b) 12m (c) 18m (d) 24m
14. The velocity of a bullet is reduced from 200m/s to 100m/s while travelling through a wooden block of thickness 10cm . The retardation, assuming it to be uniform, will be
 (a) $10 \times 10^4 \text{ m/s}^2$ (b) $12 \times 10^4 \text{ m/s}^2$ (c) $13.5 \times 10^4 \text{ m/s}^2$ (d) $15 \times 10^4 \text{ m/s}^2$
15. The displacement of a particle is proportional to the cube of time elapsed. How does the acceleration of the particle depends on time obtained
 (a) $a \propto t^2$ (b) $a \propto 2t$ (c) $a \propto t^3$ (d) $a \propto t$
16. Two trains, each 50 m long are travelling in opposite direction with velocity 10 m/s and 15 m/s . The time of crossing is
 (a) 2s (b) 4 s (c) $2\sqrt{3}\text{s}$ (d) $4\sqrt{3} \text{ s}$
17. A boat is sent across a river with a velocity of 8 km/hr . If the resultant velocity of boat is 10 km/hr , then velocity of the river is :
 (a) 10 km/hr (b) 8 km/hr (c) 6 km/hr (d) 4 km/hr
18. A train of 150 meter length is going towards north direction at a speed of 10m/sec . A parrot flies at the speed of 5 m/sec towards south direction parallel to the railway track. The time taken by the parrot to cross the train is
 (a) 12 sec (b) 8 sec (c) 15 sec (d) 10 sec
19. A boat moves with a speed of 5 km/h relative to water in a river flowing with a speed of 3 km/h and having a width of 1 km . The minimum time taken around a round trip is
 (a) 5 min (b) 60 min (c) 20 min (d) 30 min
20. Two bodies of different masses m_a and m_b are dropped from two different heights a and b . The ratio of the time taken by the two to cover these distances are
 (a) $a : b$ (b) $b : a$ (c) $\sqrt{a} : \sqrt{b}$ (d) $a^2 : b^2$
21. A body is released from a great height and falls freely towards the earth. Another body is released from the same height exactly one second later. The separation between the two bodies, two seconds after the release of the second body is
 (a) 4.9 m (b) 9.8 m (c) 19.6 m (d) 24.5 m
22. An object is projected upwards with a velocity of 100 m/s . It will strike the ground after (approximately)
 (a) 10 sec (b) 20 s (c) 15 sec (d) 5 sec
23. A stone dropped from the top of the tower touches the ground in 4 sec . The height of the tower is about
 (a) 80 m (b) 40 m (c) 20 m (d) 160 m
24. A man in a balloon rising vertically with an acceleration of 4.9 m/sec^2 releases a ball 2 sec after the balloon is let go from the ground. The greatest height above the ground reached by the ball is ($g = 9.8 \text{ m/sec}^2$)
 (a) 14.7 m (b) 19.6 m (c) 9.8 m (d) 24.5 m
25. A rocket is fired upward from the earth's surface such that it creates an acceleration of 19.6 m/sec^2 . If after 5 sec its engine is switched off, the maximum height of the rocket from earth's surface would be
 (a) 245 m (b) 490 m (c) 980 m (d) 735 m