

Class – XI

Chapter – Motion in 1D

Date - 20.06.20

Topic –Problems from 1D

Choose the correct option for the following questions.

- 1. A particle moves in a straight line with initial velocity 4 m/s and a constant acceleration of $6m/s^2$. What is its average velocity in the time interval t = 2 sec to t = 4 sec?
 - a. 44m/s
 - b. 22m/s
 - c. 20m/s
 - d. None of these
- 2. A particle moves in a circle of radius $R = \frac{21}{22}$ with constant speed 1 m/s. what is the magnitude its average velocity in 1.5sec?
 - a. Zero
 - b. 1m/s
 - c. $\frac{21}{22}\sqrt{2}$ m/s
 - d. $\frac{7}{11}\sqrt{2}$ m/s
- 3. During the first 18 min of a 60 min trip, a car has an average speed of 11m/s. what should be the average speed for remaining 42 min so that the car is having an average speed of 21 m/s for the entire trip?
 - a. 25.3m/s
 - b. 29.2m/s
 - c. 31m/s
 - d. 35.6m/s
- 4. A particle moves along a straight line. Its position at any instant is given by $x = 32t \frac{8t^3}{3}$, where x is in m and t is in sec. find the acceleration of the particle at the instant when the particle is at rest.
 - a. $-16m/s^2$
 - b. $-32m/s^2$
 - c. $32m/s^2$
 - d. $16m/s^2$
- 5. Starting from rest a car accelerates along a straight line. In the first second it covers a distance of 2m. The velocity of the car at the end of 2^{nd} second will be
 - a. $4m/s^2$
 - b. $8m/s^2$
 - c. $16m/s^2$
 - d. None of these



 $1 \times 15 = 15$

- 6. A cart is moving along a straight line with constant speed of 30m/s. A particle is to be fired vertically upwards from the moving cart in such a way that it returns to the cart at the same point from where it was projected after the cart has moved 80m. At what speed (relative to the cart) must the particle be fired?
 - a. 10m/s
 - b. $10\sqrt{8}$ m/s
 - c. $\frac{40}{3}$ m/s
 - d. none of these
- The figure shows velocity time graph of a particle moving along a straight line. Identify the correct statement –
 a. Particle starts from the origin
 - b. Particle crosses its initial position at t = 2s
 - c. The average speed of the particle in the interval $0 \le t \le 2 s$ is zero
 - d. All of the above.



- 8. If the displacement of a particle varies with time as $\sqrt{x} = t + 3$, then
 - a. Velocity of it is inversely proportional to t
 - b. Velocity of it varies linearly with t
 - c. Velocity of it is directly proportional to \sqrt{t}
 - d. Initial velocity of the particle is zero
- 9. A particle is thrown upward from ground. It experiences a constant resistive force which can produce a retardation of $2m/s^2$. The ratio of time of ascent to the time of descent is ($g = 10m/s^2$)
 - a. 1:1
 - b. $\sqrt{2}:\sqrt{3}$
 - c. 2:3
 - d. $\sqrt{3}$: $\sqrt{2}$
- 10. A particle moving in a straight line covers half the distance with speed of 12m/s. The other half of the distance is covered in two equal time intervals with speed 4.5m/s and 7.5m/s respectively. The average speed of the particle is
 - a. 8m/s
 - b. 12m/s
 - c. 10m/s
 - d. 9.8m/s
- 11. The motion of a particle along a straight line is described by equation $x = +12t t^3$, where x is in m and t is in sec. The retardation of the particle when its velocity becomes zero is
 - a. $6m/s^2$
 - b. $12m/s^2$
 - c. $24m/s^2$
 - d. zero m/s^2

- 12. A stone is dropped from a height h. Another stone is thrown up simultaneously from the ground which reaches a height 4h. the two stones will cross each other after a time
 - a. $\sqrt{\frac{h}{8g}}$
 - b. $\sqrt{8gh}$
 - c. $\sqrt{2gh}$
 - d. $\frac{h}{2g}$
- 13. A stone is dropped from the top of a tower of height h. after 1sec another stone is dropped from the balcony 20m bellow the top of the tower. Both reach the bottom simultaneously. What is the alue of h? ($g = 10m/s^2$)
 - a. 3125m
 - b. 312.5m
 - c. 31.25m
 - d. 25.31m.
- 14. A body is thrown vertically upwards from the top of a tower. It reaches the ground in t_1 sec. if it is thrown vertically downwards from the same point with same speed, it reaches the ground in t_2 sec. If it is allowed to fall freely from the same point, then the time taken by it to reach ground is
 - a. $t = \frac{t_1 + t_2}{2}$
b. $t = \frac{t_1 t_2}{2}$
c. $t = \sqrt{t_1 t_2}$
d. $t = \sqrt{\frac{t_1}{t_2}}$
- 15. A person walks along a straight line and the displacement time graph is for his motion is as shown in the figure. His average velocity for the whole time interval will be –
 - a. 0m/s
 - b. 23m/s
 - c. 8.4m/s
 - d. None of these



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