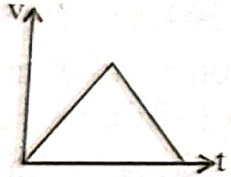
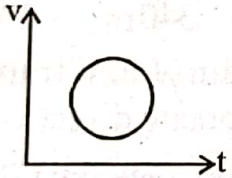
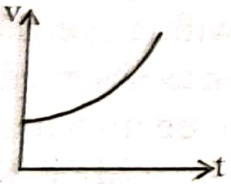
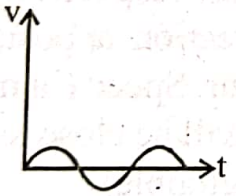
1. Which of the following curve does not represent motion in one dimension?

(a) 

(b) 

(c) 

(d) 

2. A car moves for half of its time at 80 km/h and for rest half of time at 40 km/h. Total distance covered is 60 km. What is the average speed of the car ?

(a) 60 km / h (b) 80 km / h
(c) 120 km / h (d) 180 km / h

3. A body starts from rest, what is the ratio of the distance travelled by the body during the 4th and 3rd second ?

(a) $\frac{7}{5}$ (b) $\frac{5}{7}$ (c) $\frac{7}{3}$ (d) $\frac{3}{7}$

4. A car accelerates from rest at a constant rate α for some time, after which it decelerates at a constant rate β and comes to rest. If the total time elapsed is t, then the maximum velocity acquired by the car is

(a) $\left(\frac{\alpha^2+\beta^2}{\alpha\beta}\right)t$ (b) $\left(\frac{\alpha^2-\beta^2}{\alpha\beta}\right)t$

(c) $\frac{(\alpha+\beta)t}{\alpha\beta}$ (d) $\frac{\alpha\beta t}{\alpha+\beta}$

5. A stone falls freely under gravity. It covers distances h_1, h_2 and h_3 in the first 5 seconds, the next 5 seconds and the next 5 seconds respectively. The relation between h_1, h_2 and h_3 is

(a) $h_1 = \frac{h_2}{3} = \frac{h_3}{5}$ (b) $h_2 = 3h_1$ and $h_3 = 3h_2$

(c) $h_1 = h_2 = h_3$ (d) $h_1 = 2h_2 = 3h_3$

6. A particle travels 10m in first 5 sec and 10m in next 3 sec. Assuming constant acceleration, what is the distance travelled in next 2 sec?

(a) 8.3m (b) 9.3m

(c) 10.3m (d) None of these

7. A man is 45 m behind the bus when the bus starts accelerating from rest with acceleration 2.5 m/s^2. With what minimum velocity should the man start running to catch the bus?

(a) 12 m/s (b) 14 m/s (c) 15 m/s (d) 16 m/s

8. A body moving with a uniform acceleration crosses a distance of 65 m in the 5 th second and 105 m in 9th second. How far will it go in 20 s?

(a) 2040m (b) 240m (c) 2400m (d) 2004m

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

(a) 3 ms^{-1} (b) -12 ms^{-1} (c) 42 ms^{-1} (d) -9 ms^{-1}

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

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

11. The acceleration of a moving body can be found from

(a) area under velocity-time graph

(b) area under distance-time graph

(c) slope of the velocity-time graph

(d) slope of distance-time graph

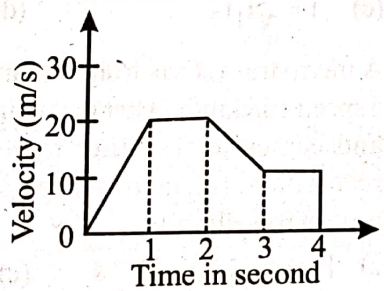
12. The variation of velocity of a particle with time moving along a straight line is illustrated in the figure. The distance travelled by the particle in four seconds is

(a) 60m

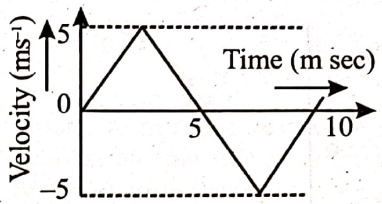
(b) 55m

(c) 25m

(d) 30m



13. The v – t plot of a moving object is shown in the figure. The average velocity of the object during the first 10 seconds is



(a) 0 (b) 2.5 ms^{-1} (c) 5 ms^{-1} (d) 2 ms^{-1}

14. A body dropped from top of a tower fall through 40 m during the last two seconds of its fall. The height of tower is ($g = 10$ m/s^2)

(a) 60m (b) 45m (c) 80m (d) 50m

15. The water drops fall at regular intervals from a tap 5 m above the ground. The third drop is leaving the tap at an instant when the first drop touches the ground. How far above the ground is the second drop at that instant ? (Take $g = 10$ m/s^2)

(a) 1.25m (b) 2.50m (c) 3.75m (d) 5.00m

16. Two stones of different masses are dropped simultaneously from the top of a building, then

(a) smaller stone hit the ground earlier

(b) larger stone hits the ground earlier

(c) both stones reach the ground simultaneously

(d) which of the stones reach the ground earlier depends on the composition of the stone

17. From the top of a building 40 m tall, a boy projects a stone vertically upwards with an initial velocity 10 m/s such that it eventually falls to the ground. After how long will the stone strike the ground ? Take $g = 10$ m/s^2.

(a) 1 s (b) 2 s (c) 3 s (d) 4 s

18. A train of 150 metre length is going towards north direction at a speed of 10 m/s . A parrot flies at the speed of 5 m/s 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 particle moves along a semicircle of radius 10m in 5 seconds. The average velocity of the particle is

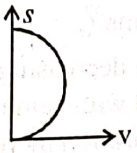
(a) 2π ms^{-1} (b) 4π ms^{-1}

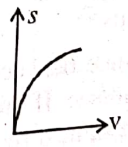
(c) 2 ms^{-1} (d) 4 ms^{-1}

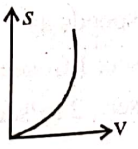
20. Two cars are moving in the same direction with the same speed 30 km/hr. They are separated by a distance of 5 km, the speed of a car moving in the opposite direction if it meets these two cars at an interval of 4 minutes, will be

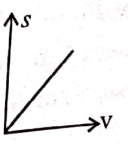
(a) 40 km/hr (b) 45km/hr (c) 30 km/hr (d) 15 km/hr

21. An object is moving with a uniform acceleration which is parallel to its instantaneous direction of motion. The displacement(s) – velocity (v) graph of this object is

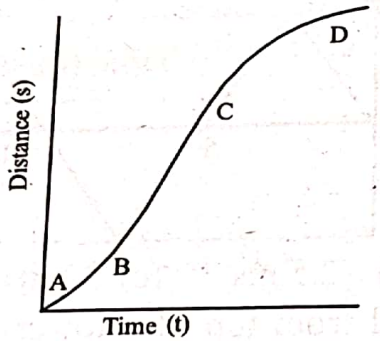
(a) 

(b) 

(c) 

(d) 

22. A particle shows distance - time curve as given in this figure. The maximum instantaneous velocity of the particle is around the point:



(a) B (b) C (c) D (d) A

23. A particle moves a distance x in time t according to equation $x = (t+5)^{-1}$. The acceleration of particle is proportional to:

(a) (velocity) $^{3/2}$ (b) $(\text{distance})^2$

(c) $(\text{distance})^{-2}$ (d) $(\text{velocity})^{2/3}$

24. **Statement 1 :** Magnitude of average velocity is equal to average speed.

Statement 2 : Magnitude of instantaneous velocity is equal to instantaneous speed.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement -1

(b) Statement-1 is True, Statement -2 is True; Statement-2 is NOT a correct explanation for Statement - 1

(c) Statement-1 is True, Statement- 2 is False

(d) Statement-1 is False, Statement -2 is True

25. **Assertion :** When velocity of a particle is zero then acceleration of particle is also zero.

Reason : Acceleration is equal to rate of change of velocity.

(a) Assertion is True, Reason is True; Reason is a correct explanation for Assertion

(b) Assertion is True, Reason is True; Reason is NOT a correct explanation for Assertion

(c) Assertion is True, Reason is False

(d) Assertion is False, Reason is True