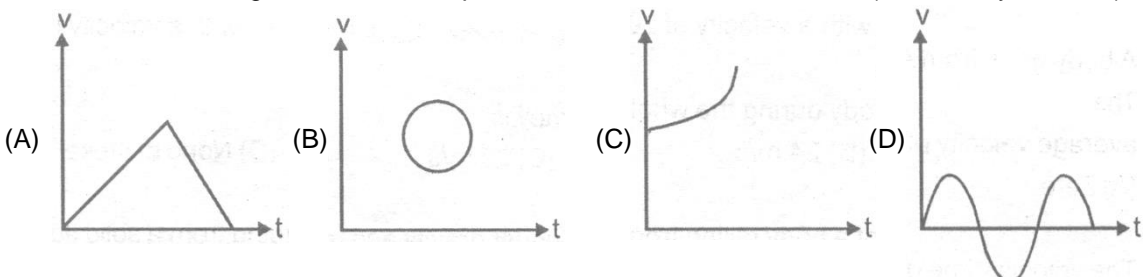
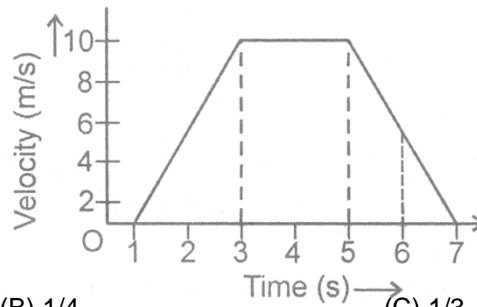


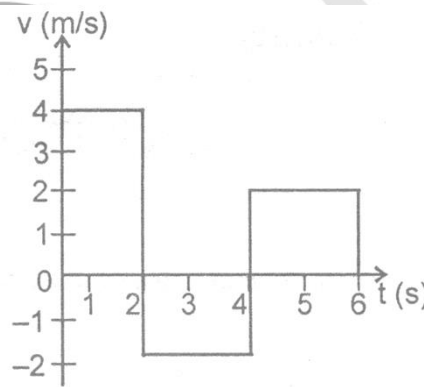
- A particle experiences constant acceleration for 20 s after starting from rest. If it travels a distance X_1 , in the first 10 s and distance X_2 , in the remaining 10s, then which of the following is true ?
(A) $X_1 = 2X_2$ (B) $X_1 = X_2$ (C) $X_2 = 3X_1$ (D) None of these
- A train passes over a 400 m long bridge. If the speed of the train is 30 m/s and the train takes 20s to cross the bridge, find the length of the train :
(A) 400 m (B) 600 m (C) 800 m (D) 200 m
- A ball is thrown up with a certain velocity. It attains a height of 40 m and comes back to the thrower. Then the :
(A) total distance covered by it is 40 m (B) total displacement covered by it is 80 m
(C) total displacement is zero (D) total distance covered by it is zero
- From the top of a tower, a particle is projected upwards and it reaches the ground after 5 second. The initial velocity of the particle is 12 m/s, the height of the tower is :
(A) 55 m (B) 65 m (C) 75 m (D) 85 m
- Two bodies of different masses m_a and m_b are dropped from two different heights a and b. The ratio of times taken by the two bodies to drop through these distance is :
(A) $\sqrt{a} : \sqrt{b}$ (B) $a^2 : b^2$ (C) $a : b$ (D) $\frac{m_a}{m_b} \times \frac{b}{a}$
- A particle experiences a constant accelerating force after starting from rest. If it travels a distance x in the first two seconds and distance y in next two seconds, then :
(A) $y = 4x$ (B) $y = 3x$ (C) $y = 2x$ (D) $y = x$
- A lead ball and a snow ball of identical radius are released from a certain height in vacuum. The time taken by both of them to reach the ground are :
(A) unequal (B) exactly equal
(C) roughly equal (D) in the ratio of the density of lead and snow
- Which of the following curves do not represent motion in one dimension : (v = velocity, t = time)

- A girl swims in a swimming pool of length 100m. She swims from one end to another end and reaches the starting point again in 2 minutes the average speed of the swimmer is :
(A) 100 ms^{-1} (B) 0.83 ms^{-1} (C) 1.67 ms^{-1} (D) zero
- A device used to measure the distance is known as :
(A) speedometer (B) sonometer (C) odometer (D) galvanometer

11. For the velocity time graph shown in figure the distance covered by the body in the last two seconds of its motion is what fraction of the total distance covered ?



- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{2}{3}$

12. The velocity-time graph of a body moving in a straight line is shown in figure. The displacement and distance traveled by the body in 6 seconds are respectively :

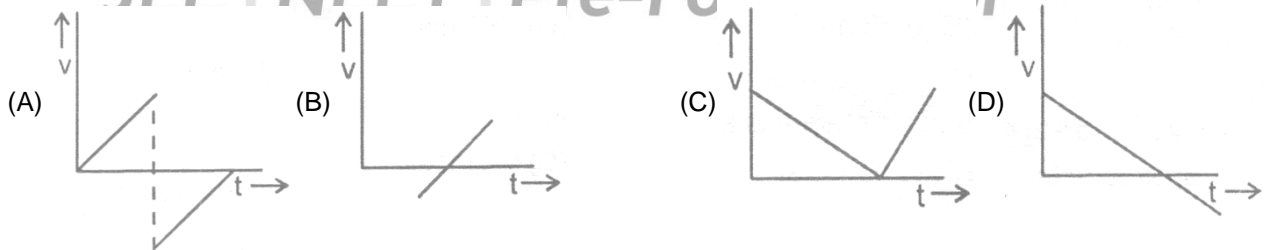


- (A) 16 m, 8 m (B) 8 m, 16 m (C) 16 m, 16 m (D) 8 m, 8 m

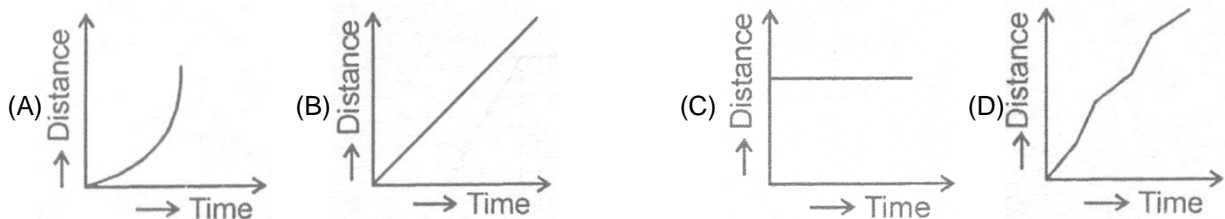
13. A body goes from A to B with a velocity of 20 m/s and comes back from B to A with a velocity of 30 m/s. The average velocity of the body during the whole journey is :

- (A) zero (B) 24 m/s (C) 25 m/s (D) None of these

14. The velocity - time graph of a body falling from rest under gravity and rebounding from a solid surface is represented by which of the graphs shown in figure ?

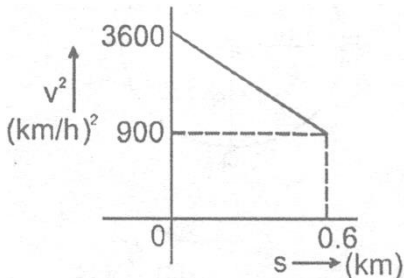


15. Which of the given distance-time graph (Figure) represents the accelerated motion of a body ?

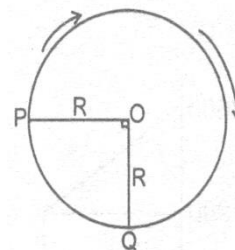


16. An aircraft has a take off velocity of 180 km/h. What length of runway is needed ? The acceleration of aircraft along the runway is 2.5 m/s^2 :

- (A) 100 m (B) 150 m (C) 320 m (D) 500 m

17. A balloon of mass 1000 kg is floating at some height. If 100 kg mass is released from the balloon. Then the acceleration of the balloon is : [$g = 10 \text{ ms}^{-2}$]
 (A) 1.1 ms^{-2} upward (B) 1.1 ms^{-2} downward (C) 10 ms^{-2} upward (D) 10 ms^{-2} downward
18. A person travels along straight road for the first half time with a velocity v_1 and the second half time with a velocity v_2 . The mean velocity v is given by :
 (A) $V = \frac{V_1 + V_2}{2}$ (B) $\frac{2}{V} = \frac{1}{v_1} \times \frac{1}{v_2}$ (C) $v = \sqrt{(v_1)v_2}$ (D) $v = \sqrt{\frac{v_2}{v_1}}$
19. A truck traveling due north at 50 km h^{-1} turns west and travels at the same speed. What is the change in velocity
 (A) 50 km h^{-1} north-west (B) $50\sqrt{2} \text{ km h}^{-1}$ north-west
 (C) 50 km h^{-1} south-west (D) $50\sqrt{2} \text{ km h}^{-1}$ south-west
20. A driver accelerates his car first at the rate of 2.4 m/s^2 and then at the rate of 1.6 m/s^2 . The ratio of the two forces exerted by the engine in the two cases will be:
 (A) 1 : 2 (B) 2 : 1 (C) 2 : 3 (D) 3 : 2
21. A graph between the square of the velocity of particle and the distance s moved by the particle is shown in the figure. The acceleration of the particle in km/h^2 is :

 (A) 2250 (B) 225 (C) -2250 (D) -225
22. The speed of a body is 1 ms^{-1} . The angle between distance time graph of the body and the time axis is :
 (A) 0° (B) 30° (C) 45° (D) 60°
23. A Car accelerates from rest at a constant rate α for some time after which it decelerates at a constant rate β to come to rest. If the total time elapsed is t second, the maximum velocity reached is :
 (A) $\left(\frac{\alpha\beta}{\alpha+\beta}\right)t$ (B) $\frac{1}{2}\left(\frac{\alpha\beta}{\alpha+\beta}\right)t^2$ (C) $\frac{\alpha\beta}{t}$ (D) $\frac{t}{\alpha\beta}$
24. A man is standing 40 m behind the bus. Bus starts with 1 m/s^2 constant acceleration and also at the same instant the man starts moving with constant speed 9 m/s. The time taken by man to catch the bus will be :
 (A) 10 s (B) 8 s
 (C) 5 s (D) both (A) and (B) are correct
25. A particle is dropped from a tower. It is found that it travels 55 m in the last second of its journey. The height of tower is : ($g = 10 \text{ m/s}^2$)
 (A) 125 m (B) 180 m (C) 100 m (D) 55 m
26. A 150 m long train accelerates uniformly from rest. If the front of the train passes a railway worker 50 m away from the station at a speed of 25 m/s, what will be the speed of the back part of the train as it passes the worker
 (A) 100 m/s (B) 20 m/s (C) 50 m/s (D) 12.5 m/s
27. A player completes a circular path of radius r in 40 s. At the end of 2 minutes 20 seconds, displacement will be :
 (A) $2r$ (B) $2\pi r$ (C) $7\pi r$ (D) Zero

28. A body moves along the circumference of a circular track of radius R (Figure). What is displacement of the body when it covers $3/4$ th of its circumference ?



- (A) $3R$ (B) $\frac{3}{4}\pi R$ (C) $\frac{3}{2}\pi R$ (D) $\sqrt{2}R$
29. The relation between linear velocity (v), angular velocity (ω) and centripetal acceleration a_r is :
 (A) $a_r = v \cdot \omega$ (B) $a_r = \frac{v}{\omega}$ (C) $v = \frac{a_r}{\omega}$ (D) none of these
30. If the linear velocity of particle is increased by 10% and angular velocity is also increased by 10% then the percent change in centripetal acceleration is :
 (A) 31% (B) 21% (C) 11% (D) 10%
31. A body of mass m is moving on a circular path of radius r . After one full round the magnitude of the change in momentum of the body is :
 (A) 0 (B) $2mv$ (C) $0.5mv$ (D) $4mv$
32. A body of mass 10 kg revolves in a circle of diameter 0.40 m, making 1000 revolutions per minute. Calculate its linear velocity.
 (A) $\frac{200\pi}{3}$ m/s (B) $\frac{2\pi}{3}$ m/s (C) $\frac{20\pi}{3}$ m/s (D) 0.2π m/s
33. A particle is moving in circular path of radius 35m, then its displacement and distance traveled in metre after completing half revolution will be : $\left(\pi = \frac{22}{7}\right)$
 (A) 0, 220 (B) 220, 0 (C) 70, 110 (D) 110, 70
34. A body is whirled in a horizontal circle of radius 20 cm. It has an angular velocity of 10 rad/s. What is the linear velocity at any point on the circular path ?
 (A) 10 m/s (B) 2 m/s (C) 20 m/s (D) $\sqrt{2}$ m/s
35. A body of mass m is moving on a circular path of radius r with constant speed V . After half round the change in momentum of the body is :
 (A) mv (B) $2mv$ (C) 0 (D) $4mv$