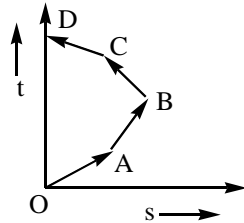
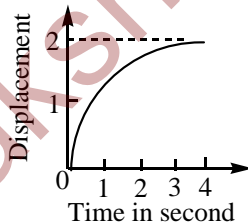


Graphs

1. Which of the following options is correct for having a straight line motion represented by $t - s$ graph?

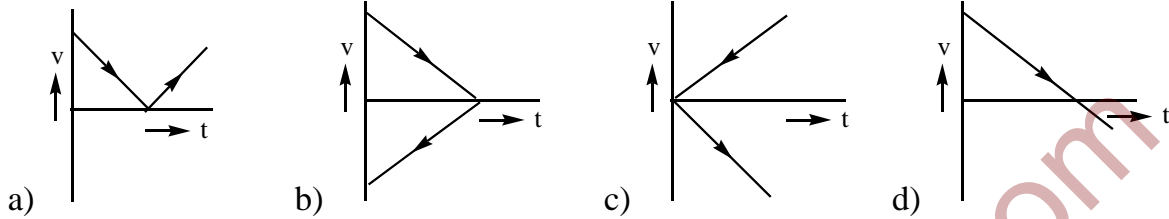


- 1) The object moves with constantly increasing velocity from O to A then it moves with constant velocity.
 - 2) Velocity of the object increases uniformly.
 - 3) Average velocity is zero.
 - 4) The graph shown is impossible.
2. The displacement of a particle as a function of time is shown in the figure. The figure shows that



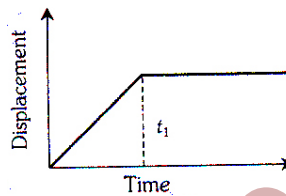
- 1) The particle starts with certain velocity but the motion is retarded and finally the particle stops.
- 2) The velocity of the particle is constant throughout.
- 3) The acceleration of the particle is constant throughout.
- 4) The particle starts with constant velocity, then motion is accelerated and finally the particle moves with another constant velocity.

3. A ball is thrown vertically upwards. Which of the following graph/graphs represent velocity–time graph of the ball during its flight (air resistance is neglected)

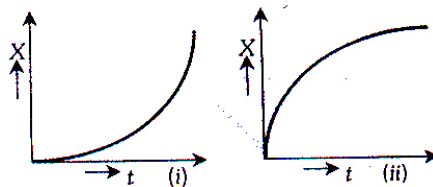


- 1) A 2) B 3) C 4) D

4. The $x - t$ graph shown in figure represents.



- 1) Constant velocity
 2) Velocity of the body is continuously changing.
 3) Instantaneous velocity
 4) The body travels with constant speed up to time t_1 and then stops
5. Figures (i) and (ii) below show the displacement – time graphs of two particles moving along the $x - axis$. We can say that



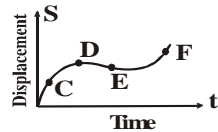
- 1) Both the particles are having a uniformly accelerated motion.
 2) Both the particles are having a uniformly retarded motion.
 3) Particle (i) is having a uniformly accelerated motion while particle (ii) is having a uniformly retarded motion.

4) Particle (i) is having a uniformly retarded motion while particle (ii) is having a uniformly accelerated motion.

6. **Velocity – time curve for a body projected vertically upwards is**

- 1) Parabola 2) Ellipse 3) Hyperbola 4) Straight-line

7. **The displacement – time graph of moving particle is shown below.**



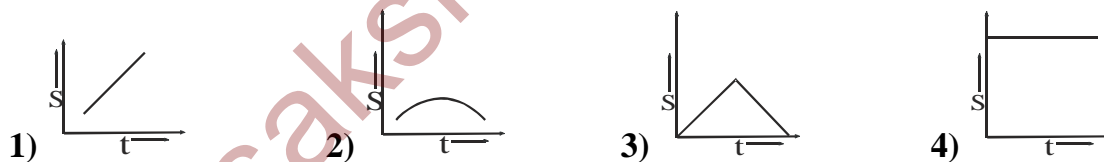
The instantaneous velocity of the particle is negative at the point.

- 1) D 2) F 3) C 4) E

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



9. **Which of the following graph represents uniform motion?**



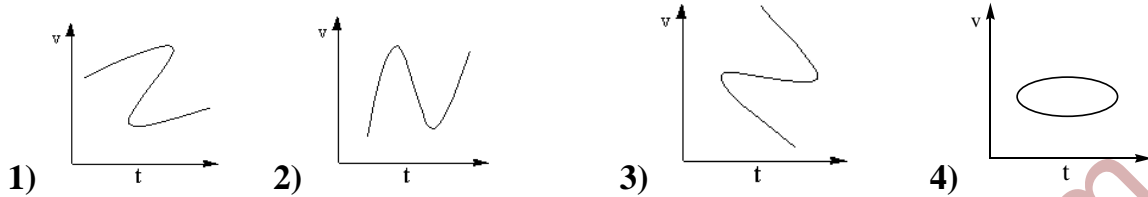
10. **The area under acceleration - time graph gives**

- 1) Distance travelled
2) Change in acceleration
3) Force acting
4) Change in velocity

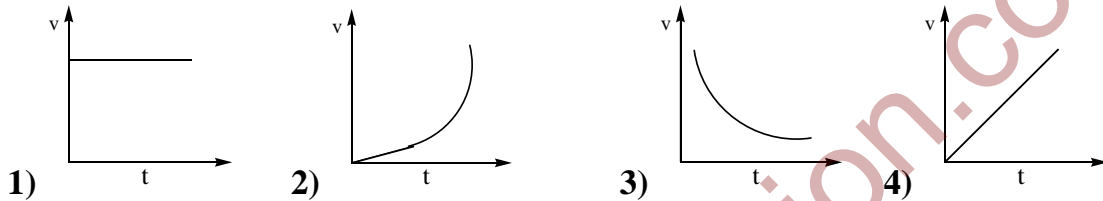
11. **Which graph represents the uniform acceleration?**



12. Which of the following velocity-time graphs shows a realistic situation for a body in motion?



13. Which of the following velocity-time graphs represent uniform motion?

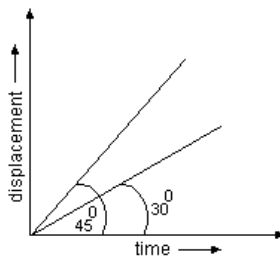


14. An elevator is going up. The variation in the velocity of the elevator is as given in the graph. What is the height to which the elevator takes the passengers?



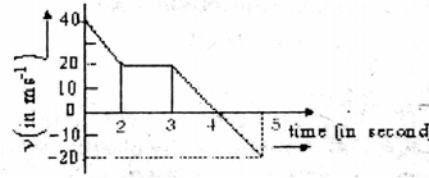
- 1) 3.6m 2) 28.8m 3) 36.0m 4) 72.0m

15. The displacement time graphs of two moving particles make angles of 30° and 45° with the x-axis. The ratio of the two velocities is



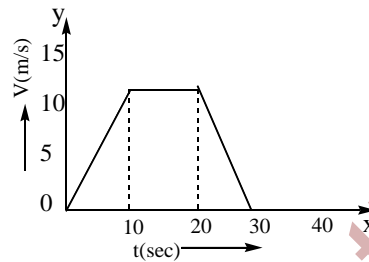
- 1) $\sqrt{3}:1$ 2) 1: 1 3) 1: 2 4) $1:\sqrt{3}$

16. In the given -t graph, the distance travelled by the body in 5second will be



- 1) 40 m 2) 100m 3) 36 m 4) 70m

17. In the following graph, distance travelled by the body in meters is



- 1) 200 2) 250 3) 300 4) 400

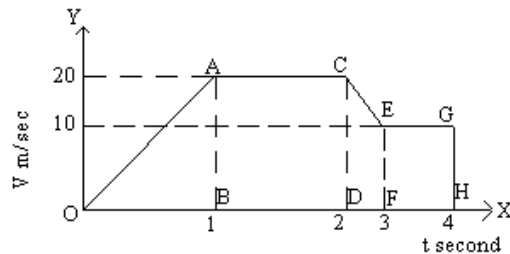
$$I \rightarrow \frac{1}{2} \times 10 \times 10 = 50$$

$$II \rightarrow 10 \times 10 = 100$$

$$III \rightarrow \frac{1}{2} \times 10 \times 10 = 50$$

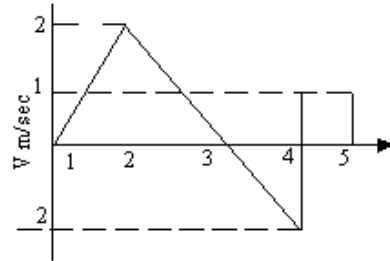
$$S_{total} = 200m$$

18. The V-t graph of a particle is as shown in the figure. The distance travelled by the particle in 4 seconds will be



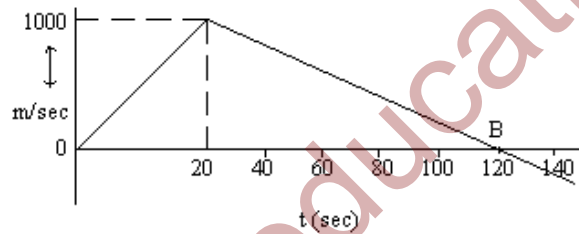
- (1) 50 m (2) 55 m (3) 60 m (4) 65 m

19. The velocity time graph of a body executing linear motion is shown in the following figure. The displacement of the particle in 5 seconds will be



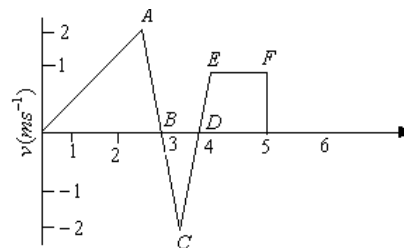
- (1) 2m (2) 3m (3) 4m (4) 5m

20. A rocket is projected vertically upwards, whose time velocity graph is shown in fig. The maximum height reached by the rocket is



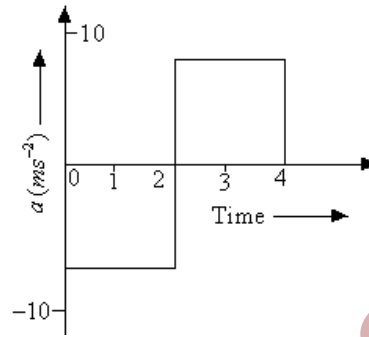
- (1) 1 km (2) 10 km (3) 20 km (4) 60 km

21) The velocity time graph of a body is as follows. What is the displacement in 5 sec?



- 1) 2m 2) 3m 3) 4m 4) 5m

22) A particle starts from rest at $t = 0$ and moves on a straight line with acceleration as shown graphically. The speed will be maximum after?



1) 1 sec

2) 2 sec

3) 3 sec

4) 4 sec

Key

1) 3

2) 1

3) 4

4) 4

5) 3

6) 4

7) 4

8) 3

9) 1

10) 4

11) 1

12) 2

13) 1

14) 1

15) 4

16) 2

17) 1

18) 2

19) 2

20) 4

21) 2

22) 3

Hints

14. $2 \times \frac{1}{2} \times 2 \times 3.6 + 3.6 \times 8 + 7.2 + 28.8 = 36 \text{ m}$

15. $\frac{v_1}{v_2} = \frac{\tan 30}{\tan 45} = \frac{1}{\sqrt{3}}$

16. $\frac{1}{2}(20+40) \times 2 + 1 \times 20 + \frac{1}{2} \times 1 \times 20 \times 2$

$60 + 40 = 100 \text{ m}$

17. $I \rightarrow \frac{1}{2} \times 10 \times 10 = 50$

$II \rightarrow 10 \times 10 = 100$

$III \rightarrow \frac{1}{2} \times 10 \times 10 = 50$

$S_{total} = 200 \text{ m}$

18. The distance covered by the particle in 4 seconds

= Area enclosed by the v-t graph

= area OAB + area ACDB + area CTE + area TEFD + area EFHG

$= \frac{1}{2} \times 1 \times 20 + (2-1) \times 20 + \frac{1}{2} (3-2) \times 20 - 10 + (3-2) \times 10 + (4-3) \times 10$

$= 10 + 20 + 5 + 10 + 10 = 55 \text{ m}$

19. Displacement of particle = Area under v-t graph

$S = \frac{1}{2} \times 3 \times 2 - \frac{1}{2} \times 1 \times 2 + 1 \times 1 = 3 \text{ m}$

20. Maximum height = Area under v - t curve

$$h = \frac{1}{2} \times 120 \times 1000 = 60 \text{ km}$$

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