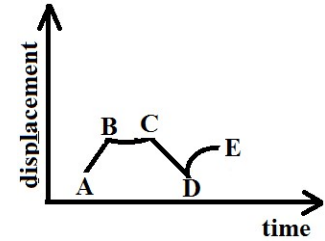


**Motion Along a Straight Line-2**

- If the distance covered is zero, the displacement  
(A) must be zero (B) may or may not be zero  
(C) cannot be zero (D) depends upon the particle
- A man walks for some time 't' with velocity (v) due east. Then he walks for same time 't' with velocity (v) due north. The average velocity of the man is  
(A) 2v (B)  $\sqrt{2}v$  (C) v (D)  $\frac{v}{\sqrt{2}}$
- A particle moving in a straight line covers half the distance with speed of 12 m/s. The other half of the distance is covered in two equal time intervals with speed of 4.5 m/s and 7.5 m/s respectively. The average speed of the particle during this motion is  
(A) 8.0 m/s (B) 12.0 m/s (C) 10.0 m/s (D) 9.8 m/s
- The position x of a particle varies with time (t) as  $x = at^2 - bt^3$ . The acceleration at time t of the particle will be equal to zero where t is equal to  
(A)  $\frac{2a}{3b}$  (B)  $\frac{a}{b}$  (C)  $\frac{a}{3b}$  (D) zero
- Initially a body is at rest. If its acceleration is  $5\text{ms}^{-2}$  then the distance travelled in the 18<sup>th</sup> second is  
(A) 86.6 m (B) 87.5 m (C) 88 m (D) 89 m
- A stone falls from a balloon that is descending at a uniform rate of  $12\text{ms}^{-1}$ . The displacement of the stone from the point of release after 10 seconds is ( $g = 9.8\text{m/s}^2$ )  
(A) 490 m (B) 510 m (C) 610 m (D) 725 m
- A car accelerates from rest at a constant rate of  $2\text{m/s}^2$  for some time. Then, it retards at a constant rate of  $4\text{m/s}^2$  and comes to rest. If it remains in motion for 3 seconds, then the maximum speed attained by the car is  
(A) 2 m/s (B) 3 m/s (C) 4 m/s (D) 6 m/s
- Drops of water fall from the roof of a building 18m high at regular intervals of time. When the first drop reaches the ground, at the same instant fourth drop begins to fall, what are the distances of the second and third drops from the roof?  
(A) 6m and 2m (B) 6m and 3m (C) 8m and 2m (D) 4m and 2m
- The velocity acquired by a body moving with uniform acceleration is  $30\text{ms}^{-1}$  in 2 seconds and  $60\text{ms}^{-1}$  in 4 seconds. The initial velocity is  
(A) zero (B)  $2\text{ms}^{-1}$  (C)  $4\text{ms}^{-1}$  (D)  $10\text{ms}^{-1}$

10. Figure shows the displacement of a particle moving along x-axis as a function of time. The acceleration of the particle is zero in the region.

- a. AB  
b. BC  
c. CD  
d. DE

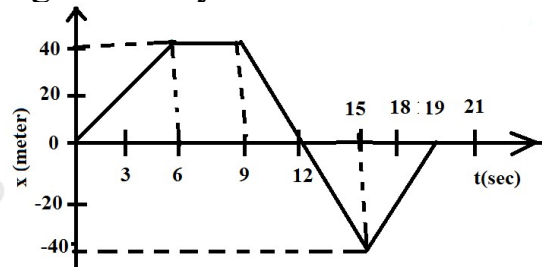


Select correct alternative

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

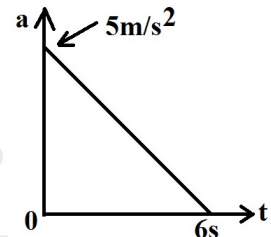
11. A person walks along an east-west street and a graph of his displacement from home is shown in figure. His average velocity for the whole time interval is

- (A) 0  
(B)  $23 \text{ ms}^{-1}$   
(C)  $8.4 \text{ ms}^{-1}$   
(D) None of above



12. A particle starts from rest. Its acceleration at time  $t=0$  is  $5 \text{ m/s}^2$  which varies with time as shown in the figure. The maximum speed of the particle will be

- (A)  $7.5 \text{ m/s}^2$   
(B)  $15 \text{ m/s}^2$   
(C)  $30 \text{ m/s}^2$   
(D)  $37.5 \text{ m/s}^2$



13. A particle moving along x-axis has acceleration  $f$ , at time  $t$ , given by  $f = f_0 \left(1 - \frac{t}{T}\right)$ , where  $f_0$  and  $T$  are constants. The particle at  $t=0$  has zero velocity. At the instant when  $f=0$ , the particle's velocity is

- (A)  $\frac{1}{2}f_0T$                       (B)  $f_0T$                       (C)  $\frac{1}{2}f_0T^2$                       (D)  $f_0T^2$

14. A bus is moving with a speed of  $10 \text{ ms}^{-1}$  on a straight road. A scooterist wishes to overtake the bus in 100s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?

- (A)  $10 \text{ ms}^{-1}$                       (B)  $20 \text{ ms}^{-1}$                       (C)  $40 \text{ ms}^{-1}$                       (D)  $25 \text{ ms}^{-1}$

15. Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time  $t_1$ . On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time  $t_2$ . The time taken by her to walk up on the moving escalator will be

- (A)  $\frac{t_1 t_2}{t_2 - t_1}$                       (B)  $\frac{t_1 t_2}{t_2 + t_1}$                       (C)  $t_1 - t_2$                       (D)  $\frac{t_1 + t_2}{2}$

1-A	2-D	3-A	4-C	5-B	6-C	7-C	8-C	9-A	10-B	11-A	12-B	13-A	14-B	15-B
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