

## RACE # 19

1. Acceleration-velocity graph of a moving particle is shown in figure. The particle is



(A) speeding up at P (B) speeding up at Q (C) speeding up at S (D) speeding down at R

2. In the picture shown, a ball standing from rest rolls down a ramp AB, goes along at the horizontal bottom BC, and then backs up a smaller ramp CD, thereafter rolls on horizontal plane DE. Ignore friction and air resistance. Which of the following figure shows variation in speed with time?





3.





4. Figure shows a sine curve, as the displacement time curve of a particle executing rectilinear motion



(A)  $\pi \text{ ms}^{-1}$  (B)  $\sqrt{3}\pi \text{ ms}^{-1}$  (C)  $\frac{\pi}{2} \text{ ms}^{-1}$  (D) None of these

5. A physics student studies rectilinear motion of a body and prepares the following graph. Which of the following conclusions best suits the above graph?



(A) The body is speeding up and its acceleration is decreasing.

(B) The body is slowing down and its acceleration is increasing.

(C) The body is speeding up and its acceleration is increasing.

(D) The given graph cannot describe any physically realizable motion.

6. The velocity time graph of a particle moving in a straight line is given in the figure. Then starting from t = 0, the particle

(A) Continuously speed up

(B) First slows down and then speeds up

(C) Moves with constant acceleration

- (D) Moves with acceleration of constant magnitude which changes direction at  $t = t_0$
- 7. Figure shows acceleration versus time graph of a particle starting from rest and moving along a straight line. Which of the following statement(s) is/are correct ?



- (A) The maximum velocity attained by the particle is  $250 \text{ ms}^{-1}$
- (B) The particle stops nowhere.
- (C) The particle eventually moves with constant speed.
- (D) The body gets retarded during the time interval 15 s < t  $\le$  20 s.





8.





- 9. A particle moves on x-axis with a velocity which depends on time as per equation  $v = t^2 8t + 15$  (m/s) where time t is in seconds. Match the columns.
  - Column-I
  - (A) At t = 4s
  - (B) At t = 2s
  - (C) At t = 6 s
  - (D) At t = 5s

## **Column-II**

- (P) acceleration is in positive direction.
- (Q) acceleration is in negative direction.
- (R) acceleration is zero.
- (S) particle moves in positive direction.
- (T) particle moves in negative direction.
- 10. The diagram shows the position-time graph for a particle moving in a straight line. The distance (in m) covered by the particle in the time interval t = 0 to t = 5s is



**11.** A car starting from rest is accelerated at constant rate until it attains a speed of 12 m/s. It moves with the constant speed 12 m/s for some time and then it is retarded at other constant rate until it comes to rest. Considering that the car moves with constant speed for half of the time of total journey, what will be the average speed of the car for the whole journey (in m/s) ?

N_Race # 19		ANSWER KEY	
<b>1. Ans. (B)</b>	2. Ans. (A)	3. Ans. (A)	4. Ans. (A)
5. Ans. (A)	6. Ans. (B,C)	7. Ans. (A,B,C)	
8. Ans. (A) S; (B) R; (C) P, T; (D) Q, S		9. Ans. (A) R,T, (B) Q,S (C) P,S (D) P	
10. Ans. 025	11. Ans. 9		