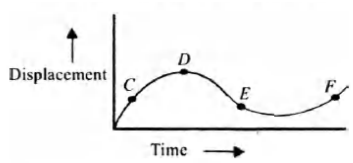
CBSE

MOTION IN A STRAIGHT LINE WS 5

Class 11 - Physics

Section A

1. The displacement-time graph of a moving particle is shown ahead. The instantaneous velocity of the particle is negative at the point **[1]**



a) D

b) F

c) E

d) C

2. A drag racer starts her car from rest and accelerates at 10.0 m/s^2 for the entire distance of 400 m . What is the speed of the race car in m/s at the end of the run? **[1]**

a) 89.4

b) 87.2

c) 86.0

d) 90.3

3. The change in position or displacement (Δx) divided by the time intervals (Δt), in which the displacement occurs is known as **[1]**

a) acceleration

b) average acceleration

c) speed

d) average velocity

4. **Assertion:** The speed of a body can be negative. **[1]**

Reason: If the body is moving in the opposite direction of positive motion, then its speed is negative.

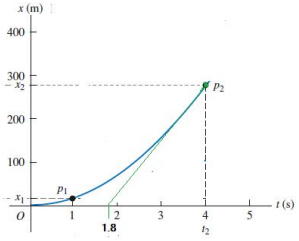
a) If both assertion and reason are true and the reason is the correct explanation of assertion.

b) If both assertion and reason are true but the reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

5. With reference to the figure below which shows a particle moving along a straight line, the y-axis represents the position and x-axis represents time. If x_2 = 270m, the instantaneous velocity at x_2 in m/s is **[1]**



a) 123.0

b) 130

c) 145

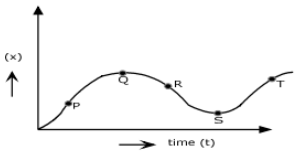
d) 138

[1]

6. A man swims in a river with and against water at the rate of 15 kmh^{-1} and 5 kmh^{-1}. Find the man's speed in still water and the speed of the river.

7. What causes variation in velocity of a particle? **[1]**

8. The figure shows a displacement-time graph. Comment on the sign of velocities at point P, Q, R, S and T **[1]**



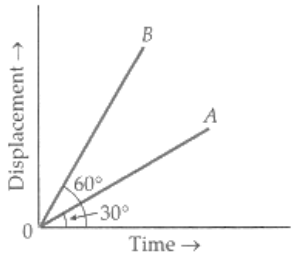
9. Is it possible in straight line motion a particle have zero speed and a non-zero velocity? **[1]**

Section B

10. **State True or False:** **[2]**
    (a) Whenever a ball is dropped, its initial velocity is always equal to zero. **[1]**
    (b) If velocity is zero, then acceleration must be zero too. **[1]**

11. **Fill in the blanks:** **[2]**
    (a) _____ speed of the scooter is measured by the speedometer. **[1]**
    (b) _____ velocity of a body is defined as the change in position or displacement divided by the time interval in which that displacement occur. **[1]**

12. Two straight lines drawn on the same displacement-time graph make angles 30° and 60° with time-axis respectively, as shown in Figure. Which line represents greater velocity? What is the ratio of the two velocities? **[2]**

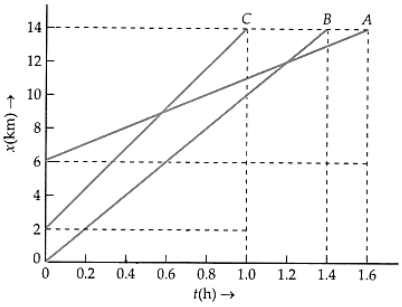


13. A bus starting from rest moves with a uniform acceleration of 0.1 m/s^2 for 2 min. Find **[2]**
    i. the speed acquired and
    ii. the distance travelled.

14. A bird is tossing (flying to and fro) between two cars moving towards each other on a straight road. One car has a speed of 18 km/hr while the other has the speed of 27Km/hr. The bird starts moving from the first car towards the order and is moving with the speed of 36Km/hr and when the two cars were separated by 36Km. What is the total distance covered by the bird? **[2]**
    Main concept used: Bird will fly to and fro till both the cars meet together. So the total distance covered by the bird during the time = speed of bird $\times$ time to meet the cars together.

Section C

15. Figure shows the position-time graphs of three cars A, B and C. On the basis of the graphs, answer the following questions: **[5]**



i. Which car has the highest speed and which the lowest?

ii. Are the three cars ever at the same point on the road?

iii. When A passes C, where is B?

iv. How far did car A travel between the time it passed cars B and C?

v. What is the relative velocity of car C with respect to car A?

vi. What is the relative velocity of car B with respect to car C?