ASSIGNMENT
CHAPTER-1 MOTION

1 Marks questions

Q. 1. Define the term displacement. Is it a vector quantity or a scalar quantity?

Q. 2. Define the term distance. Is it a vector quantity or a scalar quantity?

Q. 3. The displacement of a body can never be greater than the distance covered by a body. Is the statement true or false?

Q. 4. Can a body have zero velocity and still acceleration? Give example.

Q. 5. What is the nature of distance time graph for uniform motion of an object?

Q. 6. What is the acceleration of a freely falling body?

Q. 7. What is the acceleration of a body moving with uniform velocity?

Q. 8. What does the slope of a distance-time graph gives?

Q. 9. What does the area of a velocity-time graph gives?

Q. 10. Give two examples of vector quantities.

2 Marks questions

1. An object is moving up an inclined plan. Its velocity changes from 15m/s to 10m/s in two seconds. What is its acceleration? (ans. -2.5m/s2)

2. A body covered a distance of x metre along a semicircular path. Calculate the magnitude of displacement of the body, and the ratio of distance to displacement?

3. A particle moving with an initial velocity of 5m/s is subjected to a uniform acceleration of -2.5m/s2. Find the displacement in the next 4 sec. (ans. 0)

4. A car covers 30km at a uniform speed of 30km/hr. what should be its speed for the next 90km if the average speed for the entire journey is 60km/h? (ans. 90km/hr)

5. A person goes to market, makes purchases and comes back at a constant slower speed. Draw displacement -time and velocity time graphs of the person?

6. A boy runs for 10 min. at a uniform speed of 9km/h. At what speed should he run for the next 20 min. so that the average speed comes 12km/hr? (ans.13.5km/h)

7. A particle was at rest from 9 a.m. It moved at a uniform speed 10km/hr from 9.30 a.m. to10 a.m. Find the average speed between (a) 9.00 a.m. and 10.00 a.m., (b) 9.15 a.m. and 10.00 a.m. (ans. 5km/h, 6.67km/h)

8. An insect moves along a circular path of radius 10 cm with constant speed. If it takes 1 min. to move from a point on the path to the diametrically opposite point, find (a) the distance covered, (b) The speed, (c) the displacement, (d) average velocity.

9. A particle with a velocity of 2m/s at t=0 moves along a straight line with a constant acceleration of 0.2m/s2. Find the displacement of the particle in 10s?

10. A particle is pushed along a horizontal surface in such a way that it starts with a velocity of 12m/s. Its velocity decreases at a uniform rate of 0.5m/s2. (a) Find the time it will take to come to rest. (b) Find the distance covered by it before coming to rest?

11. A train accelerated from 20km/hr to 80km/hr in 4 minutes. How much distance does it cover in this period? Assume that the tracks are straight?

12. A cyclist moving on a circular track of radius 50m completes one revolution in 4 minutes. What is his (a) average speed (b) average velocity in one full revolution?

14. Define the term "uniform acceleration". Give one example of a uniformly accelerated motion.

15. Define the term acceleration . Is it a vector quantity or a scalar quantity?

3 Marks questions

16 Cars moving along a straight line at a speed of 54km/hr stop in 5s after the brakes are applied. (a) Find the acceleration, assuming it to be constant. (b) Plot the graph of speed versus time. (c) Using the graph. Find the distance covered by the car after the brakes are applied?

17 A car moves 100m due east and then 25m due west. (a) What is the distance covered by the car? (b) What is its displacement?

18 An athlete runs from one end to the other end of a semi circular track whose radius is 70m. What is the distance covered by the athlete and what is his displacement? [Ans: Distance= 220m, Displacement= 140m]

19 A body starts from rest and moves with a uniform acceleration of 5m/s2 for 5s and then it moves with a constant velocity for 4s. Later it slows down and comes to rest in 5s. Draw the velocity graph for the motion of the body and answer the following questions:

a. What is the maximum velocity attended by the body?

b. What is the distance travelled during this period of acceleration?

c. What is distance travelled when the body was moving with constant velocity?

d. What is the retardation of the body while slowing down?

e. What is the distance travelled by retarding?

f. What is the total distance travelled?

Ans: (a) 25m/s, (b) 6.25m, (c) 100m, (d) 5m/s2 , (e) 62.5m,(f) 225m

20 An athlete moves 150m in 2minutes and next 50m in 20s on the same straight path. What is his average speed and average velocity?

21 A swimmer swims 90m long pool. He covers the distance of 180m by swimming from one end to other end back along the same path. If he covers the first 90m at speed of 2m/s, then how fast he swim so that his average speed is 3m/s?

22 A vehicle moves at a speed of 40 km/h, It is stopped by applying brakes which produces a uniform acceleration of -0.6m/s2 . How much distance will the vehicle move before coming to stop?

23 Brakes applied to a car produces an acceleration of 5m/s2 in the opposite direction to the motion. If car takes 1.5s to stop after applying the brakes. Calculate the distance travelled by it?

24 A person walks along the sides of a square field each side is 100m long. What is the maximum magnitude of displacement of the person in any time interval?

25 Two stones are thrown vertically upwards simultaneously with their initial velocities u1 and u2 respectively. Prove that the heights reached by them would be in the ratio of u12:u22 (Assume upward acceleration is –g and downward acceleration to be +g).