Chapter: 8 Motions Solved Test Paper -01

1. Q. What do you mean by motion and rest?

Answer: A body is said to be in motion if its position changes in time with respect to a fix point.
A body is said to be in rest if its position does not change i time with respect to a fix point. Therefore, to describe the position of an object we need to specify a reference point called the origin.

2. Q. How can you say that motion and rest are relative?

Answer: An object may be in motion for one person and in rest for some other. So, motion and rest are relative. For example, a passenger sitting in a moving bus is in rest with respect to other passengers sitting in bus. Same time he is in motion with respect to outside surrounding

3. Q. What are distance and displacement?

Ans: The length of the path covered by a moving body is called distance. The shortest distance measured from the initial to the final position of an object is known as the displacement.
Automobiles are fitted with a device that shows the distance travelled. Such device is known as an odometer.
The displacement during motion may be zero but the distance cannot be zero.
If the final position coincides with the initial position the displacement will be zero.
The magnitude of the displacement may be equal or less than that of distance travelled by an object.
Distance is always positive whereas displacement may be positive as well as negative and even zero.

4. Q. What do you mean by magnitude?
Ans: The numerical value of a physical quantity is called its magnitude

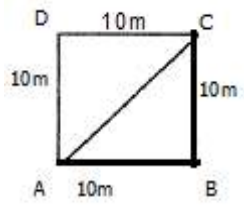
5. Q. What do you mean by Scalar and Vector Quantity?

Answer: The physical quantities which have both direction and magnitude are known as a vector Quantity. E.g. Displacement, velocity, acceleration, Force, momentum, weight and electric field etc.
The physical quantities which have only magnitude are known scalar quantity or a scalar. E.g. Charge, distance, area, speed, time temperature, density, volume, work, power, energy, pressure, potential etc.

6. Q. An object has moved through a distance. Can it have zero displacement? If yes, support your answer with an example.

Ans: Yes, An object can have displacement zero if the final position coincides with the initial position .For example during circular motion on completing one round displacement will be zero.

7. Q. A farmer moves along the boundary of a square field of side 10 m in 40 s. What will be the magnitude of displacement of the farmer at the end of 2 minutes 20 seconds from his initial position?



Solution: Distance cover in one round = Perimeter of square field

= 4 x side = 4 x10=40m;

The taken to cover 40m is 40sec. So, speed of farmer = d/t = 40/40=1m/s

Now, Distance covered in 2 min 20 sec = s x t = 1x140 =140m = 3 x 40m + 20m =120 +AB +BC

Thus, Displacement from A to C = AC = $\sqrt{AB^2 + AC^2}$ = $\sqrt{10^2 + 10^2}$ = 10$\sqrt{2}$ m

8.Q.Which of the following is true for displacement? (a) It cannot be zero. (b) Its magnitude is greater than the distance travelled by the object.

Ans: Both the statements are not true for displacement.

9. Q. A runner running along a circle runs the circle completely. What is his displacement? What distance has he run?

Answer: Displacement = zero and Distance = $2\pi r$

10. Q. When a body is said to be travel with uniform motion or non-uniform motion?

Ans: if an object covers equal distance in equal interval of time, it is said to be in uniform motion where as if an objects cover unequal distance in taken to cover that distance.

Average speed = total time taken/total distance travelled

11. Q. What do you mean by velocity and Average velocity?

Answer: Velocity is rate of the change of position of an object in specific direction. It is a vector quantity.

Velocity = (displacement / time) m/s

Average Velocity: If an object moves with variable velocity we need to find average Velocity.

Case: 01- It is defined as the ratio of its total displacement to the total time interval.

Average velocity = Total displacement/Total time

Case: 02 - If initial velocity of body is u and final velocity is v then the arithmetic means of velocity is called average velocity. Average velocity = $\frac{u+v}{2}$

Note: (a) The velocity is positive if the object is moving towards the right of the origin and negative if the object is moving towards the left of the origin.(b) In uniform motion, the instantaneous velocity is equal to the average velocity at all time because velocity remains constant at each instant, at each point of the path.

12. Q. When is the average speed of an object equal to the magnitude of its average velocity? Give reason also.

Answer: When an object moves along a straight line and in the same direction its total path length is equal to the magnitude of its displacement. Hence average speed is equal to the magnitude of its average velocity.