CBSE | **CLASS-9 | Science**

Chapter-7 | Motion   Worksheet-1

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Multiple Choice Questions

1. An object is said to be in motion when it

(a) Changes its colour

(b) Changes its position with time

(c) Changes its shape

(d) Changes its mass

2. Which of the following is a scalar quantity?

(a) Displacement

(b) Velocity

(c) Acceleration

(d) Distance

3. The shortest distance between initial and final position of an object is called

(a) Speed

(b) Distance

(c) Displacement

(d) Velocity

4. If an object covers equal distances in equal intervals of time, its motion is called

(a) Non-uniform motion

(b) Circular motion

(c) Oscillatory motion

(d) Uniform motion

5. The SI unit of speed is

(a) km/h

(b) cm/s

(c) m/s

(d) m

6. The rate of change of velocity is known as

(a) Speed

(b) Displacement

(c) Acceleration

(d) Distance

7. A body moving with constant speed in a circular path is said to have

(a) Zero acceleration

(b) Constant velocity

(c) Changing velocity

(d) No motion

8. Which graph represents uniform motion?

(a) Curved distance-time graph

(b) Straight-line distance-time graph

(c) Curved velocity-time graph

(d) Zig-Zag Graph

9. The area under a velocity–time graph represents

(a) Speed

(b) Acceleration

(c) Displacement

(d) Distance per second

10. **Motion of a satellite around the Earth is an example of**
    (a) Rectilinear motion
    (b) Oscillatory motion
    (c) Random motion
    (d) Uniform circular motion

Fill in the blanks :

11. The SI unit of acceleration is _____.

12. The quantity that specifies both speed and direction is called _____.

True / False

13. An object can have zero displacement even after covering some distance.

14. Uniform circular motion is an example of accelerated motion.

Very Short Type Questions

15. Define acceleration.

16. What does an odometer measure?

Short Type Questions

17. Distinguish between distance and displacement.

18. Why is motion along a circular path considered accelerated motion?

Essay Type Questions

19. Explain uniform motion and non-uniform motion with suitable examples.

20. Describe distance–time and velocity–time graphs and explain what information they provide about motion.

HOTS

21. **Assertion (A):** An object moving in a circular path with constant speed has acceleration.
    Reason (R): The direction of velocity changes continuously during circular motion.
    a) Both A and R are true and R is the correct explanation of A
    b) Both A and R are true but R is not the correct explanation of A
    c) A is true but R is false
    d) A is false but R is true

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Answer & Solution

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1. **(b)** Changes its position with time

2. **(d)** Distance

3. **(c)** Displacement

4. **(d)** Uniform motion

5. **(c)** m/s

6. **(c)** Acceleration

7. **(c)** Changing velocity

8. **(b)** Straight-line distance-time graph

9. **(c)** Displacement

10. **(d)** Uniform circular motion

11. m/s^2

12. Velocity

13. True

14. True

15. Acceleration is the rate of change of velocity with time.

16. An odometer measures the distance travelled by a vehicle.

17. Distance is the total path covered by an object and is a scalar quantity. Displacement is the shortest distance between the initial and final positions and has direction, so it is a vector quantity.

18. In circular motion, even though speed is constant, the direction of motion changes continuously. Since velocity changes, the motion is accelerated.

19. Uniform motion is the motion in which an object covers equal distances in equal intervals of time. In this type of motion, the speed of the object remains constant. For example, a car moving on a straight road at a constant speed of 40 km/h shows uniform motion. The distance–time graph for uniform motion is a straight line, indicating constant speed.

Non-uniform motion is the motion in which an object covers unequal distances in equal intervals of time or equal distances in unequal intervals of time. In this case, the speed of the object changes with time. Examples include a car moving on a crowded road or a freely falling stone. The distance–time graph for non-uniform motion is a curved line. Most motions in daily life are non-uniform in nature.

Thus, uniform and non-uniform motions differ in terms of speed, distance covered and graphical representation.

20. Distance–time graphs show how the distance travelled by an object changes with time. Time is taken on the x-axis and distance on the y-axis. For uniform motion, the graph is a straight line, showing constant speed. For non-uniform motion, the graph is curved, indicating changing speed. The slope of the distance–time graph gives the speed of the object.

Velocity–time graphs show how velocity changes with time. Time is plotted on the x-axis and velocity on the y-axis. A straight line parallel to the time axis represents uniform velocity. A straight sloping line represents uniformly accelerated motion. The area under the velocity–time graph gives the displacement of the object. These graphs help us understand speed, velocity, acceleration and displacement clearly.

21. Correct option: a

Explanation: In circular motion, speed may remain constant but the direction of velocity changes continuously. This change in velocity causes acceleration.