WORKSHEET 1

CHAPTER 1 – MOTION

A. Tick (✓) the correct option.

1. The slope of a velocity-time graph gives

   a. the distance. b. the speed. c. the displacement. d. the acceleration.

2. If the displacement of an object is proportional to square of time, then the object moves with

   a. uniform acceleration. b. uniform velocity. c. positive acceleration. d. negative acceleration.

3. A person travels distance πR along the circumference of a circle of radius R. Displacement of the person is

   a. R. b. $2R$. c. $2\pi R$. d. zero.

4. A car goes from town A to town B with a speed of 40 km/h and returns back to town A with a speed of 60 km/h. The average speed of the car during the complete journey is

   a. 48 km/h. b. 50 km/h. c. 36 km/h. d. zero.

5. The numerical ratio of displacement to distance for a moving object is

   a. always < 1. b. always = 1. c. always > 1. d. ≤ 1.

B. Fill in the blanks.

1. If an object changes its position with respect to a reference point with the passage of time, the object is said to be in _____

2. _____ is the shortest possible distance covered by a moving object from initial point in a particular direction.

3. When a point object (small body or particle) is moving on a circular path with a constant speed, the motion of the object is said to be _____

4. The rate of change of velocity of a body with respect to time is called its _____

5. A body has _____ if it covers equal distances in equal intervals of time, no matter how small these time-intervals may be.

C. State whether the given statements are true or false.

1. The velocity of a body is the distance travelled by it per unit time.

2. A uniform circular motion is an accelerated motion.

3. Acceleration of a body moving with constant velocity is positive.

4. The slope of distance–time graph is equal to the magnitude of the speed of the moving body.

5. When the velocity of a body changes by unequal amounts in equal intervals of time, it is said to have uniform acceleration.

Name: ..... Teacher's signature: .....

Class: IX Date: .....

D. Match the following.

1.	Distance travelled	metre per second
2.	Velocity	$v = u + at$
3.	Position-time relation	metre per second square
4.	Acceleration	$S = ut + \frac{1}{2}at^2$
5.	Velocity-time relation	metre

E. Answer the following questions.

Very Short Answer Questions

1. What does the odometer of an automobile measure?
2. What is the quantity which is measured by the area occupied below the velocity–time graph?

Short Answer Questions

1. Have you ever experienced that the train in which you are sitting appears to move while it is actually at rest? If yes explain why? What do you learn from this experience?
2. Give two examples of variable velocity.

Long Answer Questions

1. During an experiment, a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of 3×10^8 ms^{-1} (speed of light).
2. A bullet is fired into a wall with a velocity of 50 m/s. If the bullet stops at the depth of 10 cm inside the wall, find the retardation provided by the wall.

ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

1. d 2. a 3. b 4. a 5. d

B. Fill in the blanks.

1. motion
2. Displacement
3. uniform circular motion
4. acceleration
5. uniform motion

C. State whether the given statements are true or false.

1. F 2. T 3. F 4. T 5. F

D. Match the following.

1. Distance travelled	metre
2. Velocity	metre per second
3. Position-time relation	$S = ut + \frac{1}{2}at^2$
4. Acceleration	metre per second square
5. Velocity-time relation	$v = u + at$

E. Answer the following questions.

Very Short Answer Questions

1. The odometer measures the distance travelled by an automobile.
2. Area occupied below the velocity–time graph is a measure of the distance travelled by the body or the displacement of the body.

Short Answer Questions

1. Yes. When the train at rest on adjoining track starts moving, we feel that our train has started moving in opposite direction, though it is actually at rest. From this experience, we learn that states of rest and motion are relative.
2. Examples are:
   a. A car moving on a crowded road (as it covers unequal distances in equal time intervals).
   b. A man running on a circular track with constant speed (as he covers equal distances in equal time intervals but his direction of motion changes continuously).

Long Answer Questions

1. Here, we have, speed = 3×10^8 ms^{-1}

   Time = 5 min

   = 5 × 60 s = 300 s

   We know that, Distance = Speed × Time

   $\Rightarrow$ Distance = 3×10^8 $ms^{-1} \times 300$ s

   = 900×10^8 m

   = 0.9×10^{11} m

2. Initial velocity of the bullet = 50 m/s

   Final velocity of the bullet = 0

   Distance travelled by the bullet = 10 cm = 0.1 m

   To calculate acceleration, we apply

   $v^2 - u^2 = 2as$

   $0 - (50 \text{ m/s})^2 = 2 \times a \times 0.1 \text{ m}$

   $a = 12500 \text{ m/s}^2$

   $= 12.5 \text{ km/s}^2$