

Class 9 CBSE Physics – Chapter 1: Motion

Test Paper (Moderate to Difficult Level)

Section A: Multiple Choice Questions (1 mark each)

1. A person walks 6 m east and then 6 m west to the starting point. Net displacement is:
A. 12 m East B. 0 m C. 6 m East D. 6 m West
2. Which of the following is a scalar quantity?
A. Displacement B. Velocity C. Acceleration D. Distance
3. A car moving east at 20 m/s slows to 10 m/s in 2 s. Acceleration is:
A. $+5 \text{ m/s}^2$ B. -5 m/s^2 C. -10 m/s^2 D. $+10 \text{ m/s}^2$
4. Constant velocity gives which distance–time graph?
A. Straight line with slope B. Horizontal line C. Curve D. Parabola
5. Quantity defined as change in velocity per unit time is: Speed / Displacement / Acceleration / Velocity
6. A bus goes A→B at 40 km/h and B→A at 60 km/h. Average speed =
A. 50 km/h B. 48 km/h C. 49 km/h D. 44 km/h
7. Uniformly accelerated motion example: A ball thrown upward.
8. Equal distances in equal intervals indicate: uniform motion.
9. Velocity increases 20→30 m/s in 5 s. Acceleration: 2 m/s^2 .
10. For uniformly accelerated motion, v – t graph is:
A. Straight line with slope.

Section B: Short Objective/Numerical (1 mark each)

11. Average speed of 50 km in 30 min (m/s)?
12. Displacement = 120 m east in 30 s. Average velocity?
13. Distance in 5 s at speed 2 m/s?
14. Acceleration from rest to 20 m/s in 4 s?
15. True/False: Uniform motion means zero acceleration.
16. Cyclist goes 20 km in 2 h, then 30 km in 1 h. Average speed?
17. Time for sound to travel 1 km at 343 m/s?
18. If acceleration = 0, describe velocity.
19. True/False: Circular motion at constant speed has changing velocity.
20. Number of equations of motion for constant acceleration?

Section C: Short Answer / Numerical (3 marks each)

21. Car starts from rest, $a = 2 \text{ m/s}^2$. Find (i) velocity in 10 s, (ii) distance.
22. Velocity-time stages: $0 \rightarrow 24 \text{ m/s}$ in 4 s; constant 6 s; $24 \rightarrow 0 \text{ m/s}$ in 6 s. Find (i) first acceleration, (ii) last deceleration, (iii) total distance.
23. Man runs 5 m north, 12 m east. Find resultant displacement magnitude and direction.
24. Velocity pattern: REST for 2 s, then 10 m/s for 3 s. Draw $v-t$; find (i) acceleration at $t = 2 \text{ s}$, (ii) total distance.
25. Car at 18 m/s for 10 s, then decelerates to rest in 5 s. Find acceleration, stopping distance, total distance.
26. Airplane accelerates at 3 m/s^2 for 30 s. Find takeoff speed and distance.
27. Racing car: $0 \rightarrow 144 \text{ km/h}$ in 2 min. Find acceleration and distance.
28. Cyclist on circular track radius 50 m at 10 m/s . Find distance in 1 min, and nature of motion.
29. Distance-time graph for rest 5 s, then 2 m/s for 5 s. Find displacement at 10 s.
30. Straight walk $A \rightarrow B$. Does average speed = average velocity? Explain.

Section D: Long Numerical (5 marks each)

31. Car accelerates $0 \rightarrow 30 \text{ m/s}$ in 10 s, constant 20 s, decelerates to 0 in 5 s. Find acceleration, distances in each phase, total distance.
32. Train at 72 km/h slows to 18 km/h in 5 s. Find acceleration and distance.
33. Bus at 20 m/s for 20 s, then accelerates to 30 m/s in 10 s. Find acceleration and total distance.

Section E: Case Study (5 marks each)

34. Raj runs 100 m east in 50 s, returns 100 m west in 50 s. Find total distance, displacement, average speed, average velocity.
35. Car accelerates $0 \rightarrow 24 \text{ m/s}$ in 4 s, constant 6 s, decelerates 6 s. Find nature of motion, accelerations, total distance.
36. Maya walks 10 m north in 5 s, waits 2 s, walks 8 m north in 4 s, walks 10 m south in 5 s. Find total distance, displacement, total time, average speed and velocity.