



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. State the SI unit of speed.
2. Convert 72 km/h to m/s.
3. Can displacement be zero while distance is nonzero?
4. Give a numerical round-trip example.
5. A runner completes one 400 m lap in 80 s. Find average speed.
6. Find average velocity for the complete lap.
7. A car travels 150 m in 10 s. Find average speed.
8. It then travels 50 m in 10 s. Find average speed for the entire trip.

B. Short answers / practice - 2 marks each

9. Velocity changes from 5 to 25 m/s in 4 s. Find acceleration.
10. Find distance in that time if acceleration is uniform.
11. A body starts from rest with acceleration 2 m/s^2 for 6 s. Find final speed.
12. Find distance travelled.
13. A train slows from 20 m/s to rest in 10 s uniformly. Find acceleration.
14. Find stopping distance.
15. What does the slope of a distance-time graph represent?
16. What does the slope of a velocity-time graph represent?
17. What does area under a velocity-time graph represent?
18. Find displacement for constant velocity 8 m/s over 7 s.
19. Does uniform circular motion have constant velocity?
20. Explain why acceleration exists even at constant speed.

C. Application / reasoning - 3 marks each

21. A cyclist travels equal distances at 10 and 15 km/h. Find average speed.
22. Find average speed if equal times are spent at those speeds.
23. A car at 10 m/s accelerates at 3 m/s^2 over 50 m. Find final speed.
24. Find time taken.
25. Can acceleration be opposite to velocity?
26. Explain using a vehicle braking in a straight line.
27. A bike accelerates from 4 to 16 m/s in 6 s. Find acceleration.
28. A car moves uniformly at 15 m/s for 2 min. Find distance.
29. An object travels 30 m east, then 10 m west in 8 s. Find average speed and velocity.
30. A body starts at 3 m/s and accelerates at 2 m/s^2 for 5 s. Find displacement.
31. Sketch a velocity-time graph for uniform slowing and show how it gives stopping distance.

D. Extended practice - 5 marks per pair

32. An object moves 4 m east then 3 m north. Find distance.
33. Find displacement magnitude.
34. An object accelerates from rest to 12 m/s in 4 s, then stays at 12 m/s for 6 s. Find total distance.
35. Draw its velocity-time graph and calculate average speed for the full 10 s.

ANSWER KEY - Numerical / closed questions

- 1) m/s. 2) 20 m/s. 3) Yes. 5) 5 m/s. 6) 0. 7) 15 m/s. 8) 10 m/s. 9) 5 m/s^2 . 10) 60 m. 11) 12 m/s. 12) 36 m. 13) -2 m/s^2 . 14) 100 m. 15) Speed. 16) Acceleration. 17) Displacement. 18) 56 m. 19) No. 21) 12 km/h. 22) 12.5 km/h. 23) 20 m/s. 24) $10/3 \text{ s}$. 25) Yes. 27) 2 m/s^2 . 28) 1800 m. 29) 5 m/s; 2.5 m/s east. 30) 40 m. 32) 7 m. 33) 5 m. 34) 96 m. 35) 9.6 m/s.