



PRACTICE WORKSHEET

Subject: Physics

Class: ICSE 9th

Chapter: Motion In One Dimension **Worksheet:** P-1

TYPE/TOPIC OF QUESTIONS: QUESTIONS BASED ON THEORETICAL CONCEPTS

1. Explain the following terms - uniform velocity, non-uniform velocity, instantaneous velocity and average velocity.
2. Define velocity. Write its mathematical expression and S.I unit. State whether it is a scalar or vector quantity.
3. Define speed. Write its mathematical expression and S.I unit. State whether it is a scalar or vector quantity.
4. Distinguish between speed and velocity. Write four points of difference.
5. Distinguish between distance and displacement. Write five points of differences.

TYPE/TOPIC OF QUESTIONS: CONVERSION OF UNITS OF SPEED

6. Express 36km/h in m/s.
7. Express 15m/s in km/h.

TYPE/TOPIC OF QUESTIONS: NUMERICALS BASED ON MOTION IN ONE DIMENSION

8. The velocity of a moving body changes at a constant rate from 50m/s to 20m/s in 3sec. Find acceleration.
9. A body takes 2h to move from point A to point B and 3h to come back. The distance between A & B is 200km. Find the average speed and average velocity.
10. A body moving with 10m/s comes to rest in 2sec. Find retardation.
11. A bullet moving with 20m/s strikes a target and comes to rest after penetrating 10cm. Calculate the retardation.
12. A bullet blasts from the barrel of a gun upward in the vertical direction with an initial speed of 700 m/s. Find the maximum altitude reached by this bullet and the time needed to reach it.
13. A body moves from rest with uniform acceleration and travels 270m in 3sec. Find the velocity of the body at 10 sec from the start.
14. A body dropped from the top of a tower acquires a velocity of 20m/s on reaching the ground. Calculate the height of the tower.
15. An object moves with a constant velocity of 15 m/s. (a) How far will it travel in 2.0 s? (b) If the time is doubled, how far will it travel?
16. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed.
17. A driver changes the speed of car from 25m/s to 10m/s in 5 seconds. Find the acceleration of the car.
18. A jeep starts from rest and attains a speed of 40 km h⁻¹ in 10 minutes. Find its uniform acceleration.
19. A bus covers a distance of 20 km from A to B at 40 km/h and while returning it travels at 50 km/h. Calculate the distance and displacement.
20. A bus covers a distance of 20 km from A to B at 40 km/h and while returning it travels at 50 km/h. Calculate the average speed and velocity.
21. A car moves with a speed of 30km/h for half an hour; 25km/h for 1 hr and 40km/hr for 2 hrs. Find average speed.
22. Find the fall time for an object dropped from an altitude of 25,000 meters, neglecting air drag.

23. A car brakes from 60 mi/h to a full stop in 4 seconds. Find the acceleration of the car during this time interval in m/s^2 .
24. If a car travels first 40km at speed of 20km/h and next 80km at a speed of 40km/h. What is the average speed of car during journey?
25. Stone dropped in a well hits water surface after 2 sec. What is the depth of well and with what speed will the stone hit water surface?
26. A Car is travelling at 20 m/s along a road. A child runs out into the road 50 m ahead and the car driver steps on the brake pedal . What must the car's deceleration be if the car is to stop just before it reaches the child?
27. A car acquires a velocity of 180km/h in 20sec starting from rest find a) acceleration b) average velocity c) the distance travelled in this time.
28. A cheetah is the fastest land animal and it can achieve a peak velocity of 100 km per hour upto distances less than 500 metres. If the cheetah spots his prey at a distance of 100 metres what is the minimum time it will take to get its prey?
29. On a 120 km long track, a train travels the first 30 km at a speed of 30km/h .How fast train travel the next 90km so that average speed would be 60km/h?
30. An object, initially at rest, moves with a constant acceleration of 10 m/s^2 . How far will it travel in (a) 2.0 s and (b) 4.0 s? If this object had an initial velocity of 4 m/s, how far will it travel in (c) 2.0 s and (d) 4.0 s?
31. A ball thrown straight up takes 2.0 s to reach a height of 40 m. Find (a) its initial speed, (b) its speed at this height, and (c) how much higher the ball will go. Take $g = 10 \text{ m/s}^2$.
32. A ball is thrown down vertically with an initial speed of 20 m/s from a height of 60 m.
Find: (a) its speed just before it strikes the ground and
(b) how long it takes for the ball to reach the ground.
Repeat (a) and (b) for the ball thrown directly up from the same height and with the same initial speed.
Take $g = 10 \text{ m/s}^2$
33. An object moving with constant acceleration changes its speed from 20 m/s to 60 m/s in 2.0 s.
(a) What is the acceleration?
(b) How far did it move in this time?

TYPE/TOPIC OF QUESTIONS: GRAPHICAL REPRESENTATION OF MOTION IN ONE DIMENSION

34. Draw the following graphs –
 - i) displacement – time graph for a stationary object
 - ii) displacement – time graph for uniform velocity
 - iii) displacement – time graph for variable velocity
 - iv) velocity – time graph for uniform velocity
 - v) velocity – time graph for uniform retardation
 - vi) velocity – time graph when the body is initially not at rest
 - vii) acceleration – time graph for motion with uniform velocity
 - viii) acceleration – time graph for uniform acceleration
 - ix) acceleration – time graph for uniform retardation.
 - x) acceleration – time graph for a freely falling body
 - xi) velocity – time graph for a freely falling body

TYPE/TOPIC OF QUESTIONS: DERIVATION OF EQUATIONS OF MOTION

35. Derive the following equations -
 - i) $v = u + at$
 - ii) $S = ut + \frac{1}{2} at^2$
 - iii) $v^2 = u^2 + 2as$