

Session 2013-14
Assignment for Class IX (Term 1)

Motion (Physics)

1. Can the state of absolute rest or motion be defined for any object? Comment.
2. Name the terms used to describe the overall motion of an object.
3. Plot the following graphs:
 - (a) distance –time graph for an object with uniform speed
 - (b) distance –time graph for an object with non- uniform speed
 - (c) velocity –time graph for uniform motion of a car
 - (d) Velocity –time graph for a car moving with uniform accelerations.
 - (e) Velocity –time graph for a car moving with non- uniform accelerations.
 - (f) A body at rest
4. Is uniform circular motion of an object accelerated or not? Give reason.
5. Give an example each of a body under positive acceleration and a body under negative acceleration.
6. Name the physical quantity which
 - (i) changes
 - (ii) remains constantduring uniform circular motion.
7. Can the average speed of a moving object be zero? Explain.
8. Can an object be accelerated if it is moving with constant speed? Justify.
9. Name two physical quantities that can be obtained from velocity – time graph.
10. A particle is moving with a uniform speed. Is it necessary that it is moving along a straight line?
11. A particle is moving with a uniform velocity. Is it necessary that it is moving along a straight line?
12. Name the physical quantities measured by
 - (i) area under v-t graph
 - (ii) slope of s-t graph
 - (iii) slope of v-t graph
13. In your everyday life you came across a range of motions in which

- a) acceleration is uniform
- b) acceleration is non uniform.

Identify one example of each of the type.

14. A car travels a certain distance with a speed of 50 km/h & returns with a speed of 40 km/h. Calculate (i) the average speed & (ii) average velocity of car for the whole journey.
15. A train travels 20 km at a uniform speed of 60 km/h and the next 20 km at a uniform speed of 80km/h. Calculate its average speed.
16. A car is traveling with a speed of 36km/h. the driver applies the brakes and retards the car uniformly. The car is stopped in 5s. Find (i) the retardation of the car (ii) distance traveled before it is stopped after applying the brakes.
17. A train is traveling at a speed of 72km/h. The driver applies brakes so that a Uniform acceleration of -0.2ms^{-2} is produced. Find the distance traveled by the train before it comes to rest.
18. A child drops a ball from a height of 10m. Assume that its velocity increases uniformly at the rate of 10m/s^2 . Find (i) the velocity with which the ball strikes the ground (ii) the time taken by the ball to reach the ground.
19. A bullet moving with velocity of 10m/s is brought to rest after penetrating the wooden plank of 4 cm thickness. Calculate the acceleration of the bullet.
20. A driver of a car traveling at 52km/h applies brakes and accelerates uniformly in the opposite direction. The car stops in 5s. Plot speed-time graph and calculate the distance traveled by the car after the brakes were applied.
21. A car starts from rest and accelerates uniformly at the rate of 1m/s^2 for 5s. It then maintains a constant velocity for next 30s. Then brakes are applied and the car is uniformly retarded to rest in 10s. find the maximum velocity attained by the car and the total distance traveled by it. Also plot v-t graph for the motion of the car
23. A boy leaves his house at 9:30 am for his school. The school is 2 km away and classes start at 10:00 am. If he walks at a speed of 3km/h for the first km, at what speed should he walk the second km to reach just in time?