

Motion

Question 1.

Two object are thrown vertically upwards simultaneously with their velocities x and y respectively. Prove that

- The heights reached by them would be in the ratio of $x^2: y^2$
- The time taken to reach the maximum height would be in the ratio of $x:y$

(Assume upward acceleration is $-g$ and downward acceleration to be $+g$).

Question 2.

Marc runs from one end to the other end of a semicircular track whose radius is 140m. What is the distance covered by the marc and what is his displacement?

Question 3. State True and false

- Displacement cannot be zero
- Average speed= Total distance/time
- Average velocity = Total displacement /time
- slope of distance-time graph indicates the speed
- It is possible to have Object moving with uniform speed but variable acceleration.
- It is possible to have Object moving with uniform velocity but non-uniform acceleration.

Question 4.

A swimmer swims 90m long pool. He covers the distance of 180m by swimming from one end to other end back along the same path. If he covers the first 90m at speed of 2m/s, then how fast should he swim so that his average speed is 3m/s?

Question 5.

A jogger moves 500m in 2 minutes and next 1000m in 30s on the same straight path. What is his average speed and average velocity?

Question 6

A big truck moving along a straight line at a speed of 54km/h stop in 5s after the breaks are applied.

- Find the acceleration, assuming it to constant.
- Plot the graph of speed versus time.
- Using the graph. Find the distance covered by the car after the brakes are applied?

Question 7.

- Write the difference between Distance and displacement
- Write the difference between Uniform and Non uniform Motion

Question 8.

Lori moves 4m due east and then 3m due west.

- What is the distance covered by the Lori?
- What is its displacement?

Question 9.

A car moves at a speed of 40km/h, It is stopped by applying brakes which produces a uniform acceleration of -0.6m/s^2 . How much distance will the vehicle move before coming to stop?

Question 10.

A person walks along the sides of a square field. Each side is 10m long. What is the maximum magnitude of displacement of the person in any time interval?

Question 11.

A particle starts from rest and moves with a uniform acceleration of 5m/s^2 for 10s and then it moves with a constant velocity for 4s. Later it slows down and comes to rest in 5s. Draw the velocity graph for the motion of the body and answer the following questions:

- What is the maximum velocity attended by the body?
- What is the distance travelled during this period of acceleration?
- What is distance travelled when the body was moving with constant velocity?
- What is the retardation of the body while slowing down?
- What is the distance travelled by retarding?
- What is the total distance travelled?