

Shorts Questions

Q1 - What are scalar and vector quantities? (2 Marks)

Q2 - Differentiate speed and velocity. (2 Marks)

Q3 - The distance 'x' of particle moving in one dimension under the action of a constant force is related to time t by relation

$$t = \sqrt{x + 3}$$

Where 'x' is in m, t is in sec. Find displacement when velocity is zero. (3 Marks)

Q4 - Explain following velocity time graphs. (3 Marks)

Q5 - A particle is moving along X axis the position is given by

$$x = K + jt^2$$

where $K = 8\text{m}$ and $j = 4 \text{ m/s}^2$ t is time. Find velocity of particle at $t = 0$, $t = 3$ sec. (3 Marks)

Q6 - A body is dropped from the top of a tower, which falls through 40m during the last two seconds of its fall. What is the height of tower? ($g = 10 \text{ m/s}^2$) (5 Marks)

Q7 - The displacement of a body is zero. Is the distance covered by it also necessarily zero? (1 Mark)

Q8 - If a body has constant speed, is it true that it can have acceleration? (1 Mark)

Worksheets- I

Q1. A ball hits a wall with a velocity of 30m/s & rebounds with the same velocity. What is the change in its velocity?

Q2. A ball is thrown straight up. What is its velocity & acceleration at the top?

Q3. The displacement of a body is given to be proportional to the cube of time elapsed. What is the nature of the acceleration of the body?

Q4. Two balls of different masses are thrown vertically upwards with same initial speed. Which one will rise to greater height?

An object is in uniform motion along a straight line. What will be position time graph for the motion of the object if: (i) $X_0 = +ve$, $v = +ve$ (ii) $X_0 = +ve$, $v = -ve$. Where X_0 and v represent initial position and uniform velocity respectively.

Q5. Two trains 120m & 80m in length are running in opposite directions with velocities 42km/h & 30km/h. In what time they will completely cross each other?

Q6. A body covers the first half of the distance between two places at a speed of 40km/h and the second half of the journey at 60km/h. What is the average speed of the car?

Q7. The displacement (in metre) of a particle moving along X axis is given by $x = 3t^2 + 5t + 5$. Calculate:

Instantaneous velocity at $t = 2s$,

Average velocity between $t = 2s$ & $t = 4s$,

Instantaneous acceleration at $t = 2s$.

Q8. On a foggy day two drivers spot each other when they are just 80m apart. They are travelling at 72km/h & 60km/h, respectively. Both of them applied brakes retarding their cars at the rate of 5m/s. Determine whether they avert collision or not.

Q9. A body starting from rest accelerates uniformly along a straight line at the rate of $10m/s^2$ for 5s. It moves for 2 seconds with uniform velocity of 50m/s. Then it retards uniformly and comes to rest in 3s. Draw velocity –time graph of the body and find the distance travelled by the body.

Worksheets II

Q1 - Explain displacement. (2 Marks)

Q2 - A body moves through distance x from a point A to a point B and returns back to A by same path. What will be the distance and the displacement covered by the body. (2 Marks)

Q3 - Give some important features of uniform motion. (2 Marks)

Q4 - A jet plane is moving with a velocity of 800 km/hr. The gases are ejecting from rear of jet plane with velocity of 1600 km/hr with respect to jet. Find the velocity of gases w.r.t a person on ground. (3 Marks)

Q5 - Draw the position time graphs for two objects initially occupying different positions but having zero relative velocity. (3 Marks)

Q6 - Derive the equations of motion $v = u + at$, $s = ut + \frac{1}{2}at^2$, $v^2 - u^2 = 2as$ by calculus. (5 Marks)

Q7 - Can a body have Constant speed but a varying Velocity? (1 Mark)

Q8 - What is frame of reference? (1 Mark)

Q9 - A car and a bike with the same kinetic energy are brought to rest by the application of brakes which provide equal retarding forces. Which of them will come to rest in a shorter distance? (1 Mark)

