

MOTION

1. What is Physical quantity?

Any quantities that can be measured with an instrument are called Physical quantity.

2. What is Scalar quantity?

Quantity which has only magnitude and no direction are called Scalar quantity.

3. What is Vector quantity? Give examples?

Quantity that has both magnitude and direction are called Vector quantity.

Example: Displacement, Force

4. Differentiate between Distance & Displacement?

<u>DISTANCE</u>	<u>DISPLACEMENT</u>
<p>1) It is the actual path travelled by the object.</p> <p>2) It is always Positive.</p> <p>3) It is a Scalar Quantity.</p>	<p>1) It is the shortest distance between actual point and final point.</p> <p>2) It is the zero Positive nor negative.</p> <p>3) It is the Vector quantity.</p>

5. Define Motion.

When the position of an object continuously changes with respect to time the body is set to be in motion.

6. Define Straight line motion.

The motion of an object along a straight line is known as Straight line motion or dimensional motion.

7. Differentiate between Uniform and Non-Uniform motion?

<u>Uniform Motion</u>	<u>Non-Uniform Motion</u>
When object cover actual distance in equal travel or time. It is said to be Uniform motion. Example : Motion of hands	When object cover unequal distance in equal time it is said to be in Non-Uniform motion. Example : Car moving on a crowded street

8. What is Speed?

Speed is the distance travelled by the object per unit Time.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \quad \text{Its SI Unit is} \quad \frac{\text{Metre}}{\text{Second}}$$

9. What is average Speed?

Average speed of an object is obtained by dividing total distance travelled by total time taken.

$$\text{Average Speed} = \frac{\text{Total Distance Travelled}}{\text{Total Time Taken}}$$

10. What is Average Velocity?

It is an object moving along a straight line with variable speed.

If the velocity of the object is changing at a uniform rate

$$\text{Average Velocity} = \frac{\text{Initial Velocity} + \text{Final Velocity}}{2}$$

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11. What is Acceleration?

Acceleration is a major change in Velocity of object per unit time.

Velocity changes from initial Value U in Time T . The acceleration = $A = \frac{V - U}{T}$

The SI Unit of Acceleration is Metre

T

12. What is Positive and Negative acceleration?

The object increases with time then its acceleration is said to be positive.

If the Velocity of object decreases with time then its acceleration is said to be Negative. Negative acceleration is also called deceleration or retardation. The direction of positive acceleration is in the direction of motion and direction of acceleration is positive to direction of motion.

13. What is Uniform and Non-Uniform acceleration?

If an object travels in a straight line and its velocity increases or decreases of time, the acceleration of the object said to be in uniform acceleration.

Example: Freely falling body

If the velocity of an object changes unequally in equal intervals of time then its acceleration is said to be Non-Uniform motion.

Example: Car moving in heavy traffic.

14. A farmer moves along a boundary of a square field of side 10m in 40s . What will be the magnitude of displacement of the farmer at the end of 2minutes 20 seconds from his initial position?

In 40s distance covered 40m. In 1minute distance covered 1m

2 minutes 20 second = $2 \times 60 + 20 = 140s$

∴ In 140 sec distance covered = 140sec 40 m = 1 Round

40m = $140/40 = 3.5$ rounds

∴ Displacement = $AB = \sqrt{10^2 + 10^2} = \sqrt{200} = 10\sqrt{2}$

15. A Bus decreases its speed from 80km to 60km in 5 second, find the acceleration of the bus?

$\frac{1km}{hr} = \frac{1 \times 1000}{60 \times 60} = \frac{1000}{3600} = \frac{10}{36} = \frac{5}{18} m/s$

$hr = 1 \times 60 \times 60 = 3600$

$U = 80Km/Hr = \frac{80 \times 5}{18} = \frac{400}{9} m/s$

$$U = 60 \text{ km/hr} = \frac{60 \times 18}{18} \times \frac{5}{9} = 150 \text{ m/s}$$

T = 5 Second

$$A = \frac{V - U}{T}$$

$$= \frac{150 - 200}{5} = \frac{-50}{5} = -10 \text{ m/s}^2$$

$$= -10 \times 1$$