

# Checklist

Saturday, 3 February 2024

11:24 pm

- that the motion of bodies through space and time can be described and analysed in terms of position, velocity, and acceleration
- velocity is the rate of change of position, and acceleration is the rate of change of velocity
- the change in position is the displacement
  - Displacement is the change of position
- the difference between distance and displacement
  - Displacement is the distance and direction (position) of an object from a given reference point. It is a vector quantity as it has both size and direction.
  - Distance is a scalar quantity – it only has size (or magnitude) and no direction.
- the difference between instantaneous and average values of velocity, speed and acceleration, and how to determine them

## **Speed :**

- no direction(scalar)
- (m/s) rate of change of distance
- Always positive or zero

## **Velocity**

- with direction (vector)
- (m/s<sup>2</sup>) rate of change of displacement.

When the direction is changing, the speed constant but the velocity changes (eg: velocity decrease as the change of displacement decrease)

The **instantaneous speed** or velocity is the speed or velocity of the object at a particular moment in time

The **average speed** is calculated by dividing the total distance covered by the total time taken.

- the equations of motion for solving problems with uniformly accelerated motion as given by

$$s = \frac{u + v}{2} t$$

$$v = u + at$$

$$s = ut + \frac{1}{2} at^2$$

$$v^2 = u^2 + 2as$$

- motion with uniform and non-uniform acceleration
- the behaviour of projectiles in the absence of fluid resistance, and the application of the equations of motion resolved into vertical and horizontal components
- the qualitative effect of fluid resistance on projectiles, including time of flight, trajectory, velocity, acceleration, range and terminal speed.