Average Speed

Average speed is defined as the total distance traveled divided by the total time taken to travel that distance. It gives a measure of how fast an object is moving over a period of time, without regard to variations in speed during the journey. It is a scalar quantity, meaning it only has magnitude and no direction. Mathematically the average speed is given

Average Speed=Total Distance /Total Time

 $v_{av} = s_{tot} / t_{tot}$

The SI unit of average speed is m/s.

Instantaneous Speed

Instantaneous speed is the speed of an object at a specific moment in time. It can be measured using a speedometer or calculated as the limit of the average speed as the time interval approaches zero. It is also a scalar quantity. It reflects any changes in speed due to acceleration or deceleration. Mathematically the instantaneous speed is given

v ins= $\Delta s / \Delta t$ as $\Delta t \rightarrow 0$

Where, Δs is the distance travelled during the given very short time interval Δt . Instantaneous speed and average speed are both scalar quantities. The SI unit of instantaneous speed is m/s.

Average Velocity

Average velocity is defined as the total displacement divided by the total time taken for that displacement. It is a vector quantity, meaning it has both magnitude and direction. It gives information about the overall change in position over time but does not provide details about variations in speed or direction during the journey. Mathematically the average velocity is give

Average Velocity=Total Displacement/Total Time

V = S/t

The SI unit of average velocity is m/s.

Instantaneous Velocity

Instantaneous velocity is the velocity of an object at a specific moment in time. It is also a vector quantity. It indicates both the speed and the direction of the object at that particular instant. It reflects changes in speed and direction due to acceleration or deceleration. Mathematically the instantaneous velocity is given:

v ins= $\Delta s / \Delta t$ as $\Delta t \rightarrow 0$

Where, v_{ins} is Instantaneous velocity, Δs is the displacement travelled during the given very short time interval Δt . The SI unit of instantaneous velocity is m/s.