ODM EDUCATIONAL GROUP
Changing your Tomorrow

MOTION

CHAPTER NO.8

SUB: PHYSICS

MOTION

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

LEARNING OBJECTIVE

Students will be able to

- Define concept of speed average speed
- Define velocity
- Define acceleration

ODM EDUCATIONAL GROUP
Changing your Tomorrow

Speed:

- The distance travelled by a body per unit time is called the speed of the body. Speed is a scalar quantity. The SI unit of speed is m/s.
  Speed = Distance travelled/Time taken.
- If a body covers equal distances in equal intervals of time, however small the intervals may be, it has uniform speed.
- If a body covers unequal distances in equal intervals of time, then it is said to be moving with non-uniform speed.
- The ratio of the total distance covered to the total time taken by the body gives its average speed.
  Average speed =Total distance / Total time taken
- The speed of a body at a given instant is its instantaneous speed.

Velocity:

- The rate of change of displacement of a body is called its velocity. Velocity can also be defined as displacement per unit time.
- In other words, the velocity of a body is the distance travelled by the body in unit time and in a given direction.
- The SI unit of speed is m/s.

Velocity = Displacement/Time taken.

- If a body has equal displacements in equal intervals of time, however small the intervals may be, it is said to be moving with uniform velocity.
- If the body is moving such that it has unequal displacements in equal intervals of time, it is said to be moving with non-uniform velocity.
- The ratio of total displacement to total time taken by the body gives its average velocity.
- Average velocity = Total displacement / total time taken
- The velocity of a body at a given instant is called its instantaneous velocity.

Differences between Speed and Velocity

1. Speed is defined as the rate of change of distance, whereas velocity is defined as the rate of change of displacement.

2. Speed is a scalar quantity whereas velocity is a vector quantity.

3. Speed is always positive whereas velocity can be positive, zero or negative.

Acceleration:

- The rate of change of velocity of a body is called its acceleration.
- The SI unit of acceleration is m/s^2 .
- Acceleration is a vector quantity.

Acceleration = Change in velocity/Time.

$a = v-u / t$

where v=final velocity

u=initial velocity

t= time taken

- Acceleration is regarded as positive if the velocity of the object is increasing and is considered to be negative if the velocity is decreasing.
- The negative acceleration is called retardation or deceleration.
- A body is considered to be moving with uniform acceleration if its rate of change of velocity with time is constant.

Acceleration due to Gravity:

- If a body is released from a height its velocity gradually increases during its fall, i.e., it has an acceleration. This is due to gravity and hence called acceleration due to gravity.
- It is generally denoted by the letter g.
- The acceleration due to gravity is defined as the increase in velocity of a freely falling body due to gravity in one second.
- Its value on Earth's surface is 9.8 m/s^2.
- If a body falls down, its velocity increases with time, so the acceleration is +g, while if a body moves vertically upwards, its velocity decreases with time, so the acceleration is -g (or the retardation is g).

HOME ASSIGNMENT

1.Distinguish between speed and velocity.

2. Under what condition(s) is the magnitude of average velocity of an object equal to its average speed?

3. What does the odometer of an automobile measure?

THANKING YOU
ODM EDUCATIONAL GROUP

ODM EDUCATIONAL GROUP
Changing your Tomorrow