KALPAVRUKSHA MODEL SCHOOL

ASSIGNMENT- 5

Class: IX **Sub: Physics** **Date: 30.06.2021**

Topic: Motion

I. Complete the assignment questions given below.

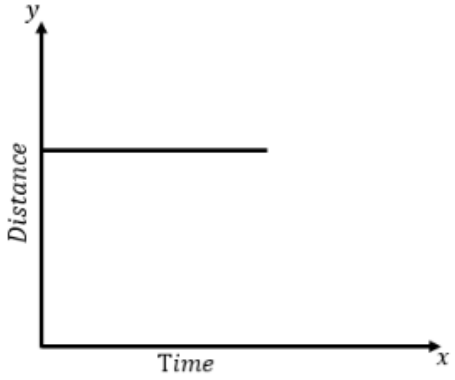
1. What are the conclusions drawn from the distance-time graph?

Ans:

- If the graph is parallel to the time axis, then the body is stationary.
- If the graph is a straight line, but not parallel to the time axis, then the body is moving with a uniform speed. The speed can be calculated by calculating the slope of the graph.
- If the graph is curve, it means that the body is moving with a variable speed. Such body can have accelerated / retarded motion.
- The graph line can never be parallel to the distance axis, as it means that the distance increases indefinitely without any increase in time. Which is impossible.

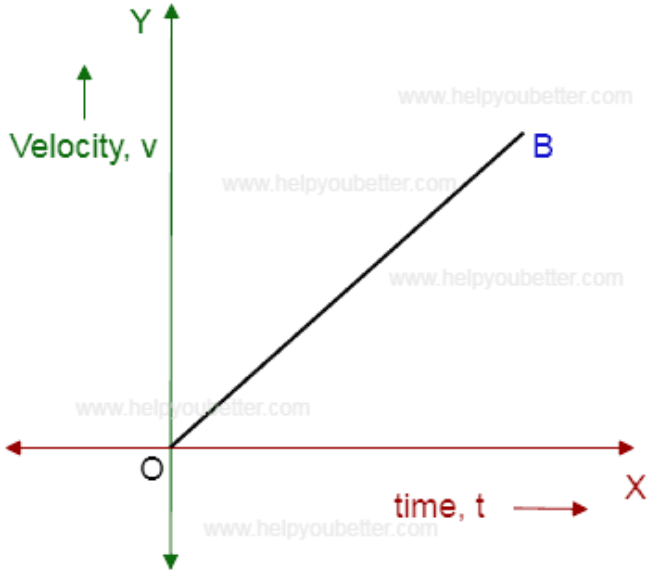
2. Draw the distance-time graph when the body is stationary.

Ans:



3. Draw the velocity-time graph when the body is moving with the uniform velocity.

Ans:



4. What is the unit of physical quantity which is represented by area under a velocity-time graph?

Ans: The area under a velocity-time graph gives the displacement and the unit of displacement is metre (m).

5. Prove v=u+at graphically.

Ans:

a) Equation for velocity – time relation (*v = u + at*) :-

Consider a velocity – time graph for a body moving with uniform acceleration 'a'. The initial velocity is u at A and final velocity is v at B in time t.

Perpendicular lines BC and BE are drawn from point B to the time and velocity axes so that the initial velocity is OA and final velocity is BC and time interval is OC. Draw AD parallel to OC.

We observe that

BC = BD + DC = BD + OA

Substituting BC = v and OA = u

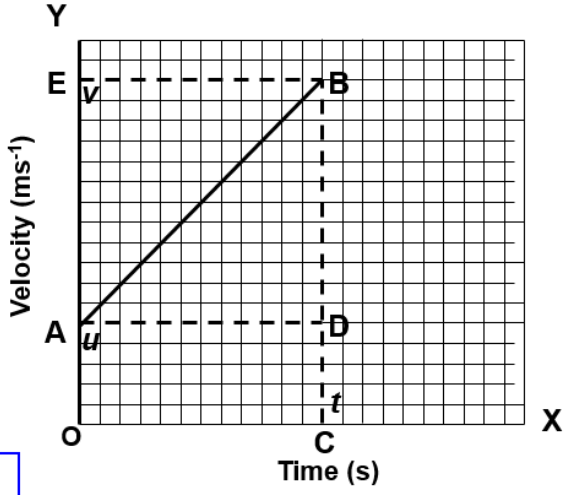
We get v = BD + u

or BD = v - u

$$\text{Acceleration} = \frac{\text{Change in velocity}}{\text{Time}}$$

$$a = \frac{BD}{AD} = \frac{BD}{OC} \quad \text{or} \quad a = \frac{v - u}{t}$$

$$v - u = at \quad \text{or} \quad \boxed{v = u + at}$$



Velocity – time graph for a uniformly accelerated motion

II. Read the chapter "Motion" from the textbook.