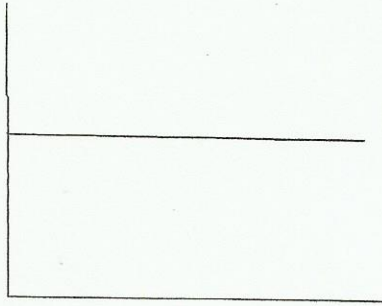


## Graphical representation of motion

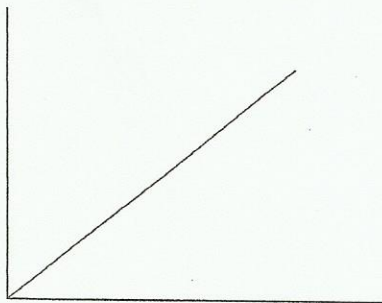
Two graphs are usually used to represent a motion of an object. They are distance time graph (position time graph) & velocity time graph.

- Distance – Time Graph of an object at rest



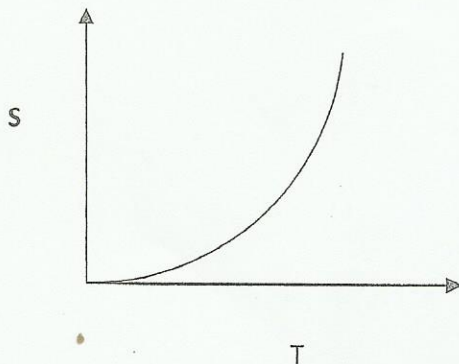
A straight line graph parallel to x-axis represent the object at rest.

- Distance-Time graph of an object moving with uniform speed.



Linear line represent uniform motion

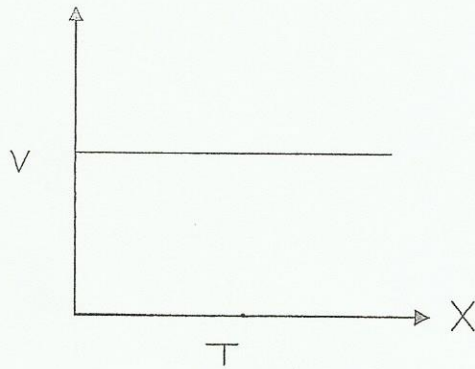
- Distance-Time graph of an object moving with non- uniform speed.



Non-Linear line represent non- uniform motion

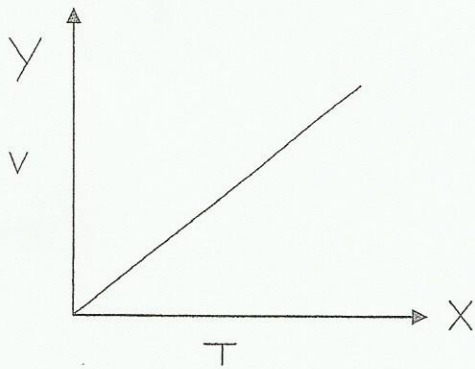
Velocity-Time graph (Speed-Time graph)

- Uniform/Constant velocity or object at rest.

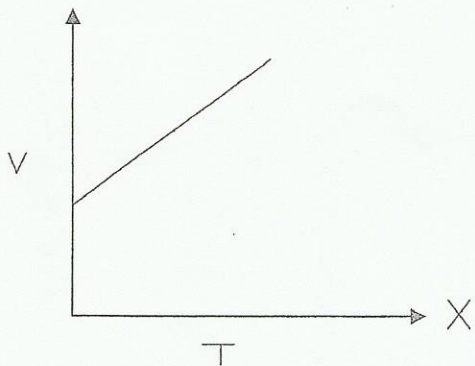


Straight line parallel to x-axis that means acceleration is zero.

Uniform acceleration

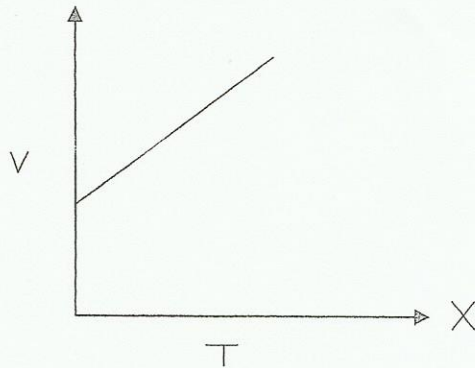


Uniformly accelerated motion when object starting from rest ( $u = 0$ )



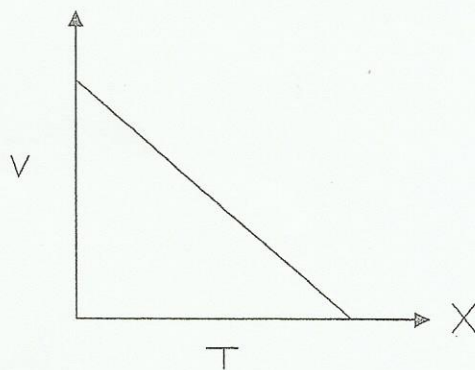
Uniformly accelerated motion when  $u \neq 0$

**Non-uniform acceleration**



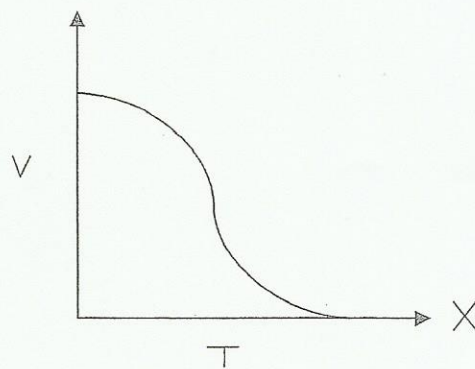
Speed-Time graph of a non-uniform motion is a curved line called parabola.

**Uniformly decelerated**



Speed -Time graph of a body straight line sloping downwards indicates uniform retardation.

**Non-Uniform retardation**



The speed - time graph of a non-uniform retardation is a curved line.

31. What is the nature of the distance time graph for uniform and non-uniform motion of an object?

The distance time graph for an object having uniform motion is a straight line with some slope.

The distance time graph for an object having non-uniform motion is a curved line.

32. What can you say about the motion of an object whose distance time graph is a straight line parallel to the time axis?

If the distance time graph of an object is a straight line parallel to the time axis, it shows that the distance of the object from its starting position is just the same at all times. Since the object remains at the same distance from the starting position, it is not moving. The object is stationary.

33. What can you say about the motion of an object if its speed time graph is a straight line parallel to the time axis?

If the speed time graph of an object is a straight line parallel to the time axis, then the speed of the object at every instant of time is the same. So the object is moving with constant speed. There is no acceleration at all.

34. What is the quantity which is measured by the area occupied below the velocity time graph.

Distance travelled by the object.

35. Use the given data to draw a distance time graph to show motion of the object. Identify the nature of motion.

i.

Time (s)	0	10	20	30	50
Distance (m)	0	20	40	60	100

ii.

Time (hrs)	1	2	3	4	5	6
Distance (km)	100	40	70	50	20	80

iii.

Time (s)	2	4	6	8	12	14
Distance (km)	20	20	20	20	20	20