AS1

1. "She moves at a constant speed in a constant direction". Rephrase the same sentence in a fewer words using concets related to motion.

Ans: The above sentence in a fewrer words can be written as - "She moves at a constant velocity".

2. In the figure given below, distance Vs. time graphs showing motion of two cars A and B are given. Which car moves fast?

Ans: Out of the two cars whose Distance - time graphs are shown in the figure, car A moves faster than car B as seen from the graph.

3. Derive the equation for uniform accelerated motion for the displacement covered in its n^{th} second of its motion. ($s_n = u + a(n - 0.5)$)

Ans: Let S_n be displacement covered, in the n^{th} second of the motion of a uniformly accelerated body. Let its initial velocity be 'u' and 'a' be its acceleration.

The displacement of the body $S_t = ut + 0.5at^2$ (formuala).

Displacement in n seconds => $S_n = un + 0.5an^2$ ....(1)

Displacement in (n-1) seconds => $S_{n-1} = u(n-1) + 0.5a(n-1)^2$ ....(2)

Subtracting S_{n-1} from S_n

$S_n - S_{n-1} = (un + 0.5an^2) - [u(n-1) + 0.5a(n-1)^2]$

$= un + 0.5an^2 - un + u - 0.5a(n-1)^2$

$= 0.5an^2 + u - 0.5a(n^2 - 2n + 1)$

$= 0.5an^2 + u - o.5an^2 + an - 0.5a$

$= u - + an - 0.5a$

$= u + a(n - 0.5)$ [Taking 'a' common]

Hence, displacement undergone in n^{th} second, $s_n = u + a(n - 0.5)$

[Here, 0.5 = 1/2]