2/10/2021

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Ch-8 ⇒ NCERT Exercises questions from 1 to 8.

Exercise Pg 112 & 113

1) diameter of track = 200m

Circumference of the track = $\pi \times d$

$= 200\pi m$

distance covered in 40 sec = $200\pi m$

distance covered in 1 sec = $200\pi/40$

distance covered in 2minutes 20sec (140 sec) = $\frac{200\pi \times 140}{40}$

$\Rightarrow \frac{200}{40} \times \frac{22}{7} \times \frac{140^{20}}{2}$

$\Rightarrow \frac{4400}{2} = 2200m.$

No. of laps completed by the athelete in 140 sec = $\frac{140}{40} = 3.5$.

∴ the final position of the athlete is at the opposite end of the circular track. Therefore, net displace = diameter of the Tra.

Distance covered = 2200m

Total displacement of athelete = 200m

2)

distance covered from point A to B = 300m

distance covered from point A to C = 300 + 100 = 400m

Time taken from A to B = 2min 30sec = 150 sec

Time taken from A to C = 2min 30sec + 1min = 210 sec

∴ displacement from A to B = 300m

displacement from A to C = 300 - 100 = 200m

i) from A to B

$$\text{Average speed} = \frac{300}{150}$$

$$= 2\text{m/s}$$

$$\text{Average velocity} = \frac{300}{150}$$

$$= 2\text{m/s}$$

ii) from A to C

$$\text{Average speed} = \frac{400}{210}$$

$$= 1.9\text{m/s}$$

$$\text{Average velocity} = \frac{200}{210}$$

$$= 0.95\text{m/s}$$

3) Let the distance travelled = x

Distance = speed × time

- When its average speed is 20 km/hr

$\Rightarrow x = v_1 \times t_1$

$= 20t_1$

- When its average speed is 30 km/hr

$\Rightarrow x = v_2 \times t_2$

$= 30t_2$

$$V_{avg} = \frac{\text{total distance}}{\text{total time}}$$

$$= \frac{x+x}{\frac{x}{v_1} + \frac{x}{v_2}} = \frac{2x}{\frac{x}{20} + \frac{x}{30}}$$

$= 24$ km/hr.

4) Given,

$u = 0$.

$a = 3 m/s^2$

$t = 8s$

$S = ?$

By using the equation $s = ut + \frac{1}{2}at^2$

$\Rightarrow \quad s = 0 \times 8 + \frac{1}{2} \times 3 \times (8)^2$

$s = \frac{1}{2} \times 3 \times 64^{32}$

$s = 96\,m.$

6) —

a) B is travelling at the fastest

b) No, all three never meet at the same point

c)

7) Given,

$u = 0$

$s = 20\,m$

$a = 10\,m/s^2$

by using the equation, $2as = v^2 - u^2$.

$2 \times 10 \times 20 = v^2 - (0)^2$

$v^2 = 400$

$v = 20\,m/s$

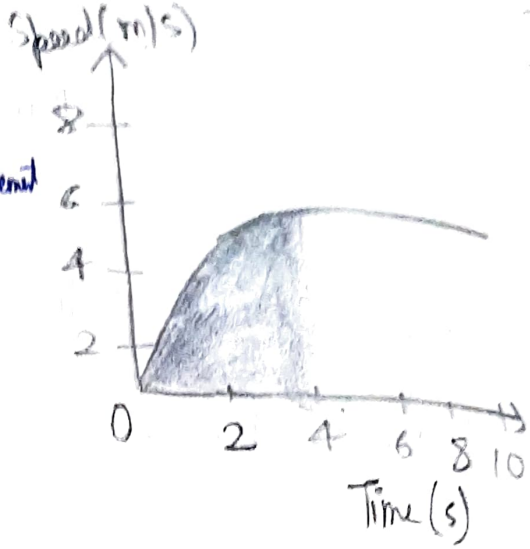
Then by using the equation $v = u + at$

$$20 = 0 + 10t$$
$$10t = 20$$
$$t = 2\,sec.$$

8) —

a)

The shaded area represents the displacement of the car over a time period of 4 sec.



$$\text{area} = \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times 4 \times 6$$

$$= 12\,m$$

∴ the car travels 12 m in first 4 sec

b) Since the speed of the car does not change from points ($x = 6$) and ($x = 10$), the car is said to be uniform motion from 6th to 10th second.