

20/11/2025

## B. Speed Time Distance

PAGE NO.:

DATE: 11

Time → hr, min, sec

Dist → km, m

$$\text{Speed} = \frac{D}{T}$$

$$T = \frac{D}{S}$$

$$S \propto \frac{1}{T}$$

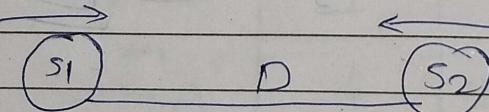
A : B
S → 2 : 3
T → 3 : 2

$$D = S \times T$$

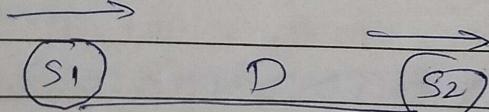
$$\text{Avg speed} = \frac{2S_1 S_2}{S_1 + S_2} \Rightarrow \boxed{\text{Dist equal}}$$

$$\Rightarrow \frac{\text{Total Dist}}{\text{Total Time}}$$

$$\text{Distance} \Rightarrow \text{Time diff} \times \frac{S_1 S_2}{S_1 - S_2}$$



$$t = \frac{D}{S_1 + S_2}$$



$$t = \frac{D}{S_1 - S_2}$$

1) A Person crosses a 600m long street in 5 minutes. what is his speed in km per hour?

- Ⓐ 3.6 Ⓑ 7.2 Ⓒ 4 Ⓓ 10

⇒

$$\begin{aligned} 5 \text{ min} &\longrightarrow 600 \text{ m} \\ 10 \text{ min} &\longrightarrow 1200 \text{ m} \\ 1 \text{ hr} \Rightarrow [60 \text{ min}] &\longrightarrow 7200 \text{ m} \Rightarrow 7.2 \text{ km} \end{aligned}$$

7.2 km/hr

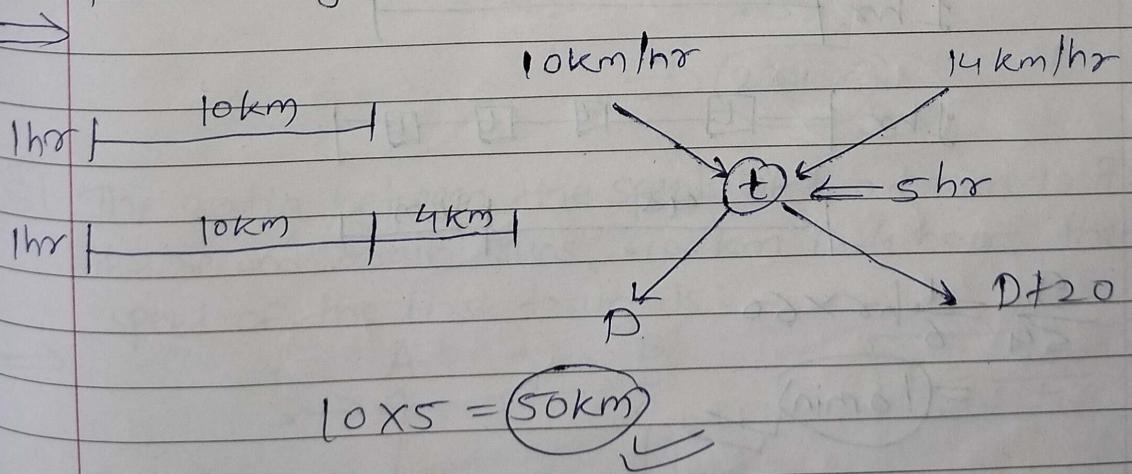
2) An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in 1 hours, it must travel at a speed of:

- Ⓐ 300 kmph Ⓑ 360 kmph Ⓒ ~~1200~~ kmph Ⓓ 720 kmph

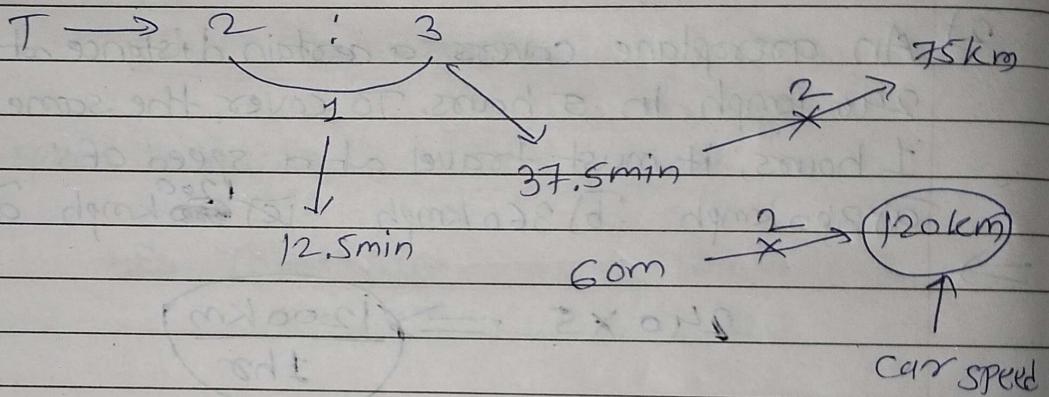
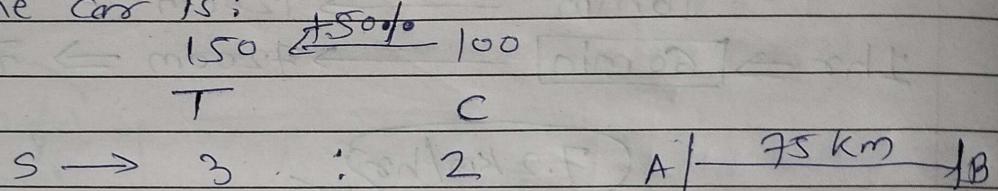
⇒

$$240 \times 5 = \frac{1200 \text{ km}}{1 \text{ hr}}$$

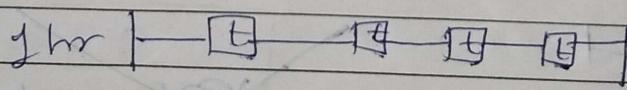
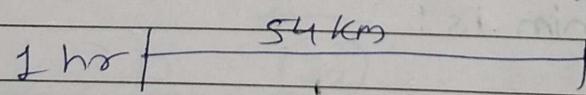
3) If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:



- 4) A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train last about 12.5 minutes while stopping at the stations. The speed of the car is:



- 5) Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?



$$\frac{9}{54} = \frac{1}{6} \text{ hr} \times 60$$

$$= 10 \text{ min}$$

By option solve

- 6) In a flight of 600km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200km/hr and the time of flight increased by 30 minutes. The duration of the flight is:

⇒ A) 1   B) 2   C) 3   D) 4

$$t_2 - t_1 = 30 \text{ min}$$

$$\left[ \frac{600}{x-200} - \frac{600}{x} = \frac{1}{2} \text{ hr} \right] \rightarrow \text{Length method}$$

$$1.5 - 1 = \frac{1}{2} \rightarrow \text{option 1} \checkmark$$

- 7) A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km:-

$$\begin{array}{c|c} \frac{1}{2} & \frac{1}{2} \\ \hline 21 \text{ km/hr} & 24 \text{ km/hr} \end{array} \rightarrow \begin{array}{l} \text{Total time} \geq \\ 10 \text{ hrs} \end{array}$$

$$\text{Total speed} \Rightarrow \frac{2s_1 s_2}{s_1 + s_2} \rightarrow \frac{2 \times 21 \times 24}{45} \times \frac{2}{10}$$

$$\Rightarrow (224 \text{ km})$$

- 8) The ratio between the speeds of two trains is 7:8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

$$\begin{array}{ccc} \Rightarrow & \begin{array}{c} A \quad :: \quad B \\ S \rightarrow 7 \quad : \quad 8 \end{array} & \left\{ B = \frac{400}{4} = 100 \text{ km/hr} \right. \\ & \downarrow & \downarrow 12.5 \\ & 7 \times 12.5 & 100 \\ & \boxed{= 87.5 \text{ km/hr}} & \end{array}$$

- 9) A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:



$$\text{Average speed} = \frac{2S_1 S_2}{S_1 + S_2} \Rightarrow \frac{2 \times 64 \times 80}{144} = \frac{640}{9} \Rightarrow 71.11 \text{ km/hr}$$

- 10) A car travelling with of its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.



$$1 \text{ hr } 40 \text{ min } \frac{48}{60} \text{ sec} \rightarrow 42 \text{ km}$$

$$60 + 40 + \frac{4}{5} \rightarrow 42 \text{ km}$$

$$12.84 \frac{504}{5} \text{ min} \rightarrow 42 \text{ km}$$

$$\frac{12}{5} \text{ min} \rightarrow 1 \text{ km}$$

$$(12 \text{ min}) \times 5 \rightarrow 5 \text{ km}$$

$$60 \text{ min} \rightarrow 25 \text{ km}$$

$$(25 \text{ km/hr})$$

By option

PAGE NO.:  
DATE: / /

- 11) In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:

a) 5 kmph b) 6 kmph c) 6.25 kmph d) 7.5 kmph

$\frac{30}{a} - \frac{30}{s} = 2$ $s = 7.5$	Abhay - a Sameer - s
$6 - 4 = 2$	option I = 5 ✓
$\frac{30}{s} - \frac{30}{2a} = 1$	
$4 - 3 = 1$	option I = 5

- 12) Robert is travelling on his cycle and has calculated to reach Point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M?

$$\Rightarrow (10 \text{ kmph}) \quad 8:00 \text{ am} \quad 6 \text{ hr} \quad 2:00 \text{ pm}$$

+      60 km

$$(15 \text{ kmph}) \quad 8:00 \text{ am} \quad 60 \text{ km} \quad 12:00 \text{ pm}$$

+      4 hr

$$D = T \text{ Diff} \times \frac{S_1 S_2}{S_1 - S_2} \quad \text{reach at 1 P.M.} \Rightarrow \frac{60}{5} \Rightarrow 12 \text{ km/hr}$$

$$\Rightarrow 2 \times \frac{10 \times 15}{S_1}$$

$$\Rightarrow 60 \text{ km}$$

13) It takes eight hours for a 600km journey, if 120km is done by train and the rest by car. It takes 20 minutes more, if 200km is done by train and the rest by car. The ratio of the speed of the train to that of the car is:

$$\Rightarrow t_{1/c} \text{ 20min} = 8 + \frac{1}{3} = \frac{25}{3}$$

$$\frac{120}{t} + \frac{480}{c} = 8$$

$$15c + 60t = tc \quad \textcircled{1}$$

$$\frac{200}{t} + \frac{400}{c} = \frac{25}{3}$$

$$24c + 48t = tc \quad \textcircled{2}$$

From  $\textcircled{1}$  and  $\textcircled{2}$

$$15c + 60t = 24c + 48t$$

$$12t = 9c$$

$$\frac{t}{c} = \frac{9}{12} = \frac{3}{4}$$

t : c
3 : 4

ratio

By option

14) A Farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot 4km/hr and partly on bicycle 9km/hr. The distance travelled on foot is:

- $\rightarrow$  a) 14 km   b) 15 km   c) 16 km   d) 17 km

Not divisible by 5

61 km

divisible by 5

$$\frac{16}{4} + \frac{61-16}{9} = 9$$

$$[4 + 5 = 9] \checkmark$$

F/A

B

$x$

$\frac{x}{4} + \frac{61-x}{9} = 9$

Solvable but

By option

efficiency

$x$  is completely

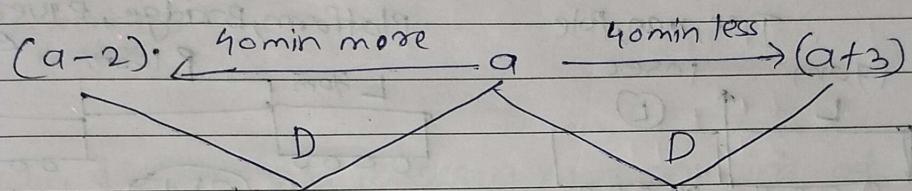
divisible

- (15) A man covered a certain distance at some speed. Had he moved 3 kmph faster, he would have taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more. The distance (in km) is:

⇒

$$D = T \text{ DIFF} \times S_1, S_2$$

$$S_1 - S_2$$



$$\frac{\frac{40}{60} \times a \times (a-2)}{2} = \frac{\frac{40}{60} \times a \times (a+3)}{3}$$

$$\frac{(a-2)}{2} = \frac{(a+3)}{3}$$

$$3a - 6 = 2a + 6$$

$$a = 12 \text{ km/hr}$$

↑ put in these  
equation

$$D = \frac{40}{60} \times \frac{12 \times (12+3)}{3}$$

$$D = \frac{40}{60} \times \frac{12 \times 15}{3}$$

$$\Rightarrow 40 \text{ km}$$