Time and Distance

Time and Distance

Placement for All.. All for Placement

This Video Completely covers Time and distance Problems which is more than sufficient for all kind of placement Exams eg: TCS/WIPRO/AMCAT/ELITMUS/CoCubes and all other placement Exams.

Time and Distance: Pratik Shrivastava(10 years of industry experience and best Aptitude trainer)

Time and Distance

Concept :

Distance = Speed * Time

D = S*T

-> Conversion of km/hr into m/s:

Km/hr --- 1 km =1000m and 1hr=3600sec

1000/3600 = 5/18

a) So km/hr can be converted into m/s multiplying by 5/18.

b) m/s can be converted to km/hr multiplying by 18/5.

Time and Distance

Concept :

Relative Speed:

If two bus/train/person moving in same direction with a speed of S1 and S2 respectively.

Then the Relative speed will be = s1 –s2

Note : S for same and S for Subtraction.

If two bus/train/person moving in opposite direction with a speed of S1 and S2 respectively.

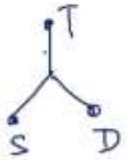
Then the Relative speed will be = s1 + s2

Time and Distance

Q1. If a boy walks at a speed of 12km/hr , he takes 20min to reach school. If he has to reach in 15minute, then with what speed he should walk.

a)14km/hr b)15km/hrc)16km/hr d)18km/hr

Solution:



Info ✓

12km/hr

20min

Speed=S

15min

$d = s \times t$

$\Rightarrow d_1 = d_2$

$\Rightarrow 4 \times 12\text{km/hr} \times 20\text{min} = S \times 15\text{min}$

$S = 16\text{km/hr}$

Time and Distance

Q2. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

A) 3.6 B) 7.2

C) 8.4 D) 10

Solution:

$d = 600\text{m}$

$t = 5\text{min}$

$\Rightarrow d = s \times t$

$\Rightarrow 600\text{m} = S \times 5 \times 60$

$2\frac{m}{s} = S$

1min = 60sec

$\frac{m}{s} \xrightarrow{\times 18/5}$

$\frac{2m}{s} \rightarrow 2 \times \frac{18}{5} = \frac{36}{5}$

$= 7.2\text{km/hr}$

Time and Distance

Q3. A man walking at the rate of 5 km/hr crosses a bridge in 15 minutes. The length of the bridge (in metres) is

A) 600 B) 750

C) 1000 D) 1250

Solution:

Info

$S = 5\text{km/hr}$

$t = 15\text{min}$

$\Rightarrow d = s \times t$

$d = 5\text{km/hr} \times \frac{5}{18} \times 15 \times 60$

$= 1250\text{m}$

$\frac{\text{km}}{\text{hr}} \xrightarrow{\times 5/18} \frac{\text{m}}{\text{s}}$

1min = 60

Time and Distance

Q4 K and L starts walking towards each other at 4 pm at speed of 3 km/hr and 4 km/hr respectively. They were initially 17.5 km apart. At what time do they meet ?

A) 6:00 am B) 6:30 pm

C) 5:45 am D) 5:52 pm

V.V.I ✓

info.

$\Rightarrow d = S \times t$ 10sec

$17.5 = 7 \times t$

$t = \frac{17.5}{7}$

$t = 2.5$ hrs

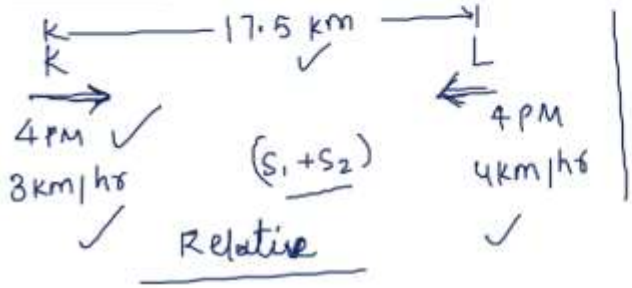
t: 2hrs 30min ✓

4pm + 2.30

6.30min

Solution:

[When time same (Question)]



Time and Distance

Q5 The distance between two cities A and B is 330 Km. A train starts from A at 8 a.m. and travel towards B at 60 km/hr. Another train starts from B at 9 a.m and travels towards A at 75 Km/hr. At what time do they meet?

A) 10 a.m B) 10.30 a.m

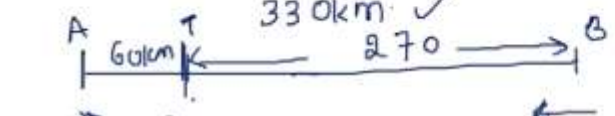
C) 11 a.m D) 11.30 a.m

60km/hr ⇒ 1hr → 60 km

Solution: info ✓

330 − 60 = 270

330km ✓



8am 9am

60km/hr

9am ✓

75km/hr

9am + 2hr: 11am

$d = S \times t$

$270 = (60 + 75) \times t$

$\Rightarrow 270 = 135 \times t$

$t = \frac{270}{135} = 2$hrs

Time and Distance

Q6 Three friends Rudra, Siva and Anvesh start to run around a circular stadium. They complete a revolution in 24, 36 and 30 seconds respectively. After how many minutes will they meet at the starting point ?

V.V.I ✓

A) 60 B) 120

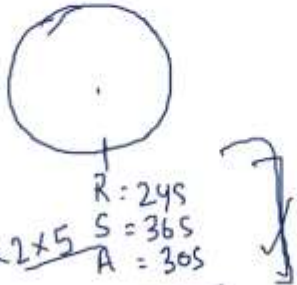
C) 36 D) 6

Solution:

$24 = 2 \times 2 \times 2 \times 3$

$30 = 2 \times 3 \times 5$

$36 = 2 \times 3 \times 2 \times 3$



R : 24S

S : 36S

A : 30S

$2 \times 3 \times 2 \times 3 \times 2 \times 5$

$= 360$sec

360/60 6min

A : 2min

B : 4min

} = 4

2 | 2, 4

1, 2

$2 \times 2 = 4$

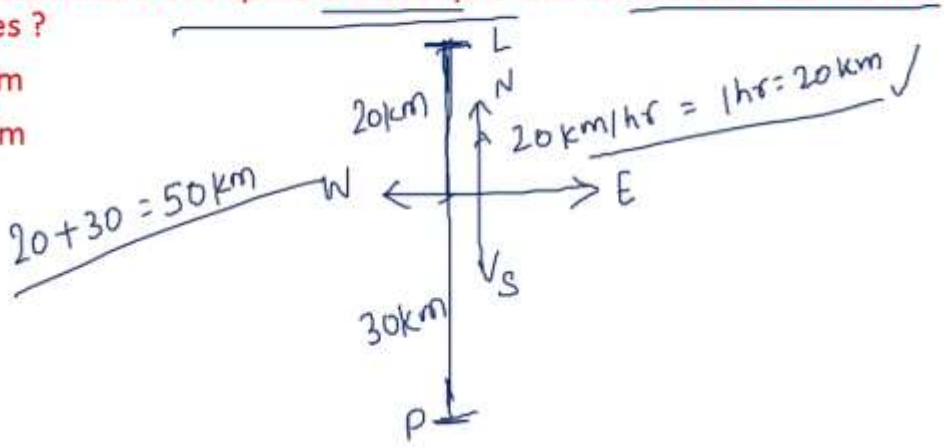
Time and Distance

Q7. Laxmi and Prasanna set on a journey. Laxmi moves northwards at a speed of 20kmph and Prasanna moves southward at a speed of 30 kmph. How far will be Prasanna from Laxmi after 60 minutes ?

A) 24 km B) 50 km

C) 42 km D) 30 km

Solution:



Time and Distance

Q8. The respective ratio between the speed of a bike, a van and lorry is 3 : 5 : 2. The speed of the van is 250 percent of the speed of the lorry which covers 360 km in 12 hours. What is the average speed of the bike and the van together?

A) 60 kmph B) 62 kmph

C) 64 kmph D) 63 kmph

Solution:

Lorry

$d = 360km, t = 12hrs$

$d = s \times t$

$s = \frac{360}{12} = 30 km/hr$

$4.5 : 7.5 : 3.0$

$3 : 5 : 2$

Info

$S_B : S_V : S_L = 3 : 5 : 2$

×15 ×15 ×15

45 75 30km/hr

$Avg = \frac{45+75}{2}$

$\frac{120}{2} = 60 km/hr$

Time and Distance

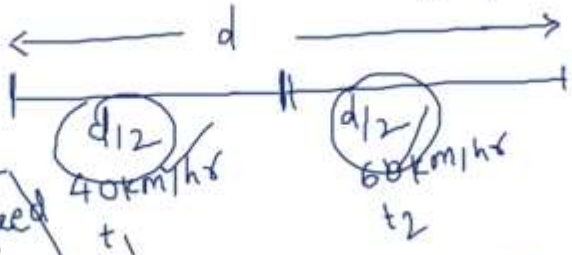
Q9. A Bus travels first half distance between two places with a speed of 40 kmph and the rest half distance with a speed of 60 kmph. The average speed of the Bus is ?

A) 48 kmph B) 50 kmph

C) 46 kmph D) 42 kmph

Solution:

Avg speed = total dist / total time



$d = s \times t$

$t = d/s$

Trick

$\frac{2 s_1 s_2}{s_1 + s_2} = Avg\ speed$

$\frac{2 \times 40 \times 60}{100} = 48 km/hr$

2 speed distance

$\frac{d}{\frac{d}{2 \times 40} + \frac{d}{2 \times 60}}$

$\frac{240}{5} = 48 km/hr$

$\Rightarrow \frac{1}{\frac{3+2}{240}}$

Time and Distance

Q9. A Bus travels first half distance between two places with a speed of 40 kmph and the rest half distance with a speed of 60 kmph. The average speed of the Bus is ?

A) 48 kmph B) 50 kmph
C) 46 kmph D) 42 kmph

Solution:

$d = s \times t$

Assume: ✓

Avg speed = total dis / total time

LCM of 40, 60 = 120

Now (d) ✓ distance = 240 ✓

40 kmph / 60 kmph

120 t_1 120 t_2

240

$= \frac{240}{\frac{120}{40} + \frac{120}{60}}$

$\frac{240}{5} = 48$

Time and Distance

Q10. A car travels a distance of 45kms at the speed of 15kmph. It covers the next 50kms of its journey at the speed of 25kmph and the last 25kms of its journey at the speed of 10kmph.what is the average speed of the car.

a)16kmph b)24kmph c)15kmph d)18kmph

[Average speed]

Solution:

Info

45km / 15 km/hr (t_1) | 50 km / 25 km/hr (t_2) | 25 km / 10 km/hr (t_3)

$d = s \times t$

$t = d/s$

Average Speed = total dis / total time $= \frac{45 + 50 + 25}{\frac{45}{15} + \frac{50}{25} + \frac{25}{10}}$ ✓ ✓ ✓

$= \frac{120}{7.5} = \frac{120 \times 10}{75} = \frac{4}{3}$ 16 km/hr

Time and Distance

Q11. A train running between two stations A and B arrives at its destination 10minutes late when its speed is 50km/hr and 50minutes late when its speed is 30km/hr. what is the distance between the stations A and B.

a)40km b)50km c)60km d)70km ✓

Solution:

$d = s \times t$

$t_2 - t_1 = 40$ min ✓

$\Rightarrow \frac{d_2}{s_2} - \frac{d_1}{s_1} = \frac{40}{60} = \frac{2}{3}$

$\Rightarrow \frac{d}{30} - \frac{d}{50} = \frac{2}{3}$

$d = \frac{s_1 \times s_2}{s_1 - s_2} \times \Delta t \Rightarrow \frac{50 \times 30}{50 - 30} \times \frac{40}{60} \Rightarrow \frac{50 \times 30}{20} \times \frac{40}{60} = 50$ km

Short tricks

A ← d → B 9:00 am

50 km/hr ✓ 9:10 am

30 km/hr ✓ 9:50 am

60 min = 1 hr

1 min = $\frac{1}{60}$ hr

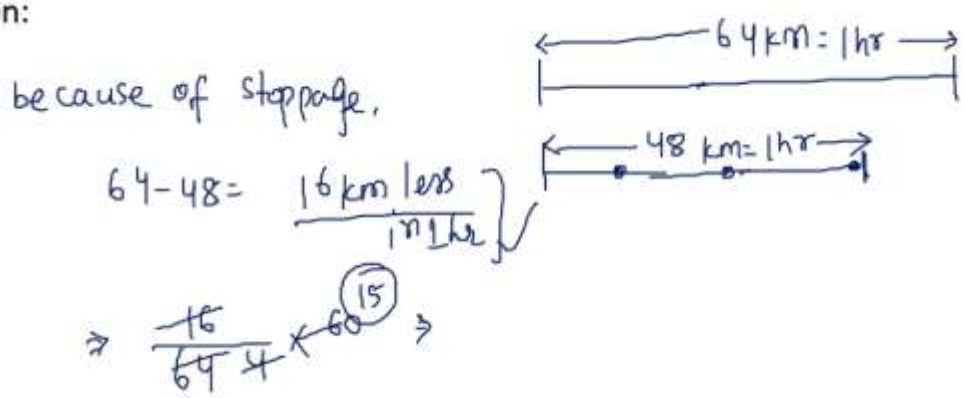
$\frac{40}{60}$ hr

Time and Distance

Q12 Excluding the stoppages, the speed of a bus is 64km/hr, and including the stoppages the speed of the bus is 48km/h. for how many minutes does the bus stop per hour.

a)12.5minutes b)15minutes c)10minutes d)18minutes

Solution:

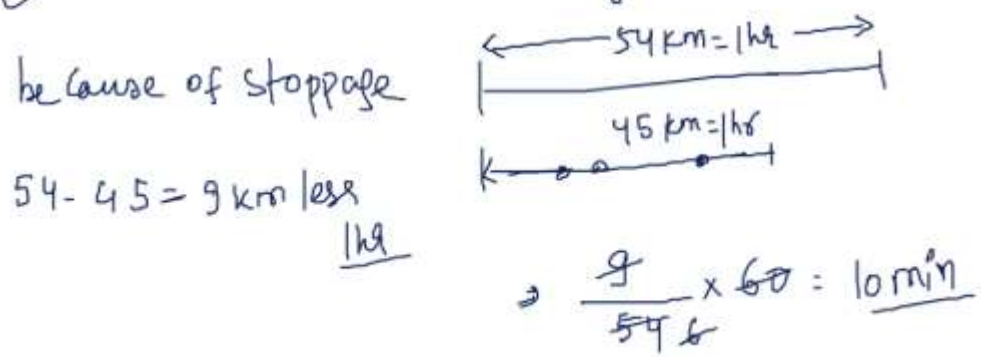


Time and Distance

Q13 Excluding the stoppages, the speed of a bus is 54km/hr, and including the stoppages the speed of the bus is 45km/h. for how many minutes does the bus stop per hour.

a)9minutes b)10minutes c)12minutes d)20minutes

Solution:

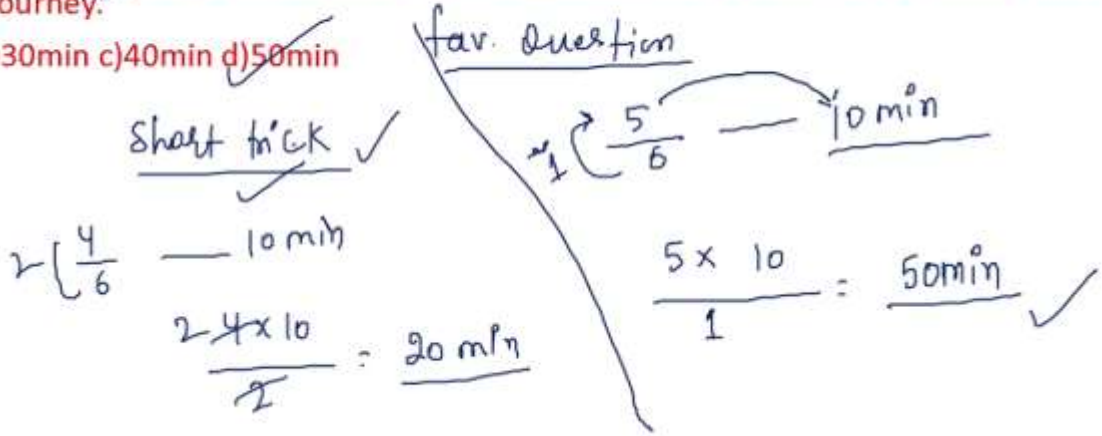


Time and Distance

Q14. Walking at 4/6 5/6 of its usual speed, a train is 10 minutes too late. Find its usual time to cover the journey.

a)20min b)30min c)40min d)50min

Solution:



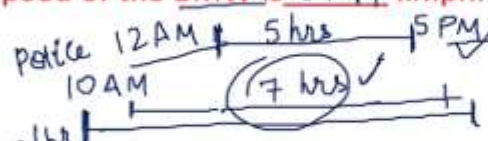
Time and Distance

Q15. A Police car starts chasing a fugitive in a BMW 2 hours after the BMW escapes from the scene of crime at 10AM . The BMW drives for 10km through the crowded roads of Shanghai and then drives into a highway, where the traffic allows vehicles to move twice as fast. After a while, the police car finally catches up with the BMW after a chase that lasted 5 hours. By this time the moon was up in the sky for 4 hours . if the average speed of the police car is 94 kmph then the average speed of the BMW is 67.14 kmph.

TCS Placement-2020 ✓

67.14 kmph

Solution:



police speed = 94 km/hr

BMW speed

distance travelled by police = distance fugitive

$94 \text{ km/hr} \times 5 \text{ hr} = 7 \text{ hr} \times S$ ✓

$\frac{94 \times 5}{7} = S$

7) 470 (67.14
42
50
49
10
7
3

Time and Distance

Q16. A Person travelled a distance of 50km in 8hrs, he covered a part of distance on foot at 4km/hr. and another part by bicycle at 10km/hr. how much distance did he travel on foot.

a.10km b.20km c.30km d.40km

Solution:

d = s × t

50 km — 8hr

x → 4km/hr

(50−x) → 10km/hr

$t_1 + t_2 = 8 \text{ hrs}$

$\Rightarrow \frac{x}{4} + \frac{50-x}{10} = 8$

$\frac{5x + 100 - 2x}{20} = 8$

$3x = 160 - 100$

$3x = 60$

$x = 20$

40 ✓

$t = \frac{40}{4} = 10 \text{ hrs}$

foot cycle

option attack short

option attack

8hrs 50km

(b) $\frac{20}{4} = 5 \text{ hrs}$

$\frac{30}{10} = 3 \text{ hrs}$

8hrs

Time and Distance

Q17. Asha drives to work at an average speed of 48km/hr. The time taken to cover the first 60% of the distance is 10minutes more than the time taken to cover the remaining distance. How far is her office.

a.30km b.40km c.45km d.48km

info ✓

S = 48 km/hr

d : d

60min = 1hr

1min : $\frac{1}{60}$ hr

$\frac{10}{60}$ hr

$\frac{d \times 60}{100} \times \frac{3}{5} = \frac{3d}{5}$

$\frac{d \times 40}{100} \times \frac{2}{5} = \frac{2d}{5}$ ✓

100% ✓ 100 − 60 = 40

$\Rightarrow t_{60\%} = 10 \text{ min} + t_{40\%}$

$t_{60\%} - t_{40\%} = \frac{10}{60} \text{ hr}$

$\Rightarrow \frac{3d}{5 \times 48} - \frac{2d}{5 \times 48} = \frac{1}{6}$

$\Rightarrow \frac{1}{5 \times 48}[3d - 2d] = \frac{1}{6}$

$\frac{1}{5 \times 48} \times d = \frac{1}{6}$

$d = 5 \times 8 = 40 \text{ km}$