> solution soL 2

1. Downstream speed, $D = \dfrac{1\,km}{\dfrac{5}{60}\,h} = \dfrac{60}{5} = 12$ km/hr

Upstream speed, $U = \dfrac{6\text{ km}}{1\,bh} = 6$ km/h

Speed of the stream, $= \dfrac{D-U}{2} = \dfrac{12-6}{2} = \dfrac{6}{2} = 3$ **km/h**

2. (d)

3. Before 10 : 00 am distance covered by first train which is running form town $A = 70 \times 2 = 140$ km

Remaining distance $= 500 - 140 = 360$ km.

Here, 360 kms is the distance which will be covered by both trains with their Relative speed in opposite direction.

Their relative speed in opposite $= 70 + 110$

$= 180$ kmph

ATQ

Time taken by both trains to cover 360 km. is

$= \dfrac{360}{180} = 2$ hrs

$\Rightarrow i.e.,$ After 2 hrs they will meet each othe and their meeting time will be

$= 12 : 00$ noon

4. Distance travelled by driver in 2 hrs

$= 300 \times \dfrac{40}{100} = 120$ km

Distance to be covered in 2 hrs

$= 300 - 120 = 180$ km

Required speed $= \dfrac{180}{2} = 90$ km/h

Required difference $= 90 - \dfrac{120}{2} = 30$ km/hr.

5.
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A   B   C
2   1
    3   1
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	A	:	B	:	C
Ratio of speed	6		3		1
Ratio of time	1		2		6

$\downarrow \times 19$ $\downarrow \times 19$

19 min   114 min

$=$ A will take 19 min

6. (d)

7. The two cars will collide if their speed are in the ratio of the distance to be covered by them

Ratio of distance $= 40 : 50 = 4 : 5$

For the cars not to collide $v_1 : v_2 \neq 4 : 5$

8. (b)

9.
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           Actual   :   reduced
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Ratio of speed $=$ 11 : 7

Ratio of time $=$ 7 : 11

Given; $11R = 22$ hrs

$R = 2$ hrs

Actual time $i.e.,$ $7R = 14$ hrs

So, time saved $= 22 - 14 = 8$ hrs

10.
	Actual	New
speed	7	6
time	6	7

1 unit $\rightarrow$ 25 min

6 unit $\rightarrow$ 150 min

$=$ usual time $=$ 2 hrs 30 min

11. Given

A's speed $= 9$ km/hr

B's speed $= 10$ km/hr

	A	:	B
Ratio of speed	$= 9$	:	10
Ratio of time	$= 10$	:	9

1 hrs more

Here we find A taks 60 min more than that of B.

But actual more time $= 36$ min

$i.e.,$ 60 units $= 36$

1 unit $= \dfrac{36}{60} = \dfrac{3}{5}$

Their travelled distance is same

Distance = Time × Speed

$= 9 \times 10$

$= 90$ ratio

Actual distance, covered by them $= 90 \times \dfrac{3}{5} = 54$ km

12.
	A	:	B
Ratio of speed $=$	4	:	5
Ratio of time $=$	5	:	4

$(5-4)R = 15$ min

$R = 15$ min

So, Time taken by $B = 4 \times 15 = 1$ hrs

Distance $= S \times T = 50 \times 1 = 50$ km

13. Let distance be 60 km

LCM 10, 20, 30, & 60

Average speed $= \dfrac{total\ distance}{total\ time}$

total time $= \dfrac{60\ km}{10\ km/h}$

$= 6 + 3 + 2 + 1 = 12$ hrs

Average speed $= \dfrac{60 + 60 + 60 + 60}{12} = \dfrac{240}{12}$

$= 20$ km/hrs

14. Avg. Speed for whole Journey $= \dfrac{2\,s_1 s_2}{s_1 + s_2}$

$= \dfrac{2 \times 20 \times 30}{20 + 30}$

$= \dfrac{2 \times 20 \times 30}{50}$

Avg. speed $= 24$ km/hr

15. Let the distance between Allahabad and Nagpur $= 300$ km

Total time taken $= \dfrac{300}{100} + \dfrac{300}{150} = 5$ hr

Average speed $= \dfrac{300 + 300}{5} = 120$ km/h

Alternate : Average speed

$= \dfrac{2xy}{x + y} = \dfrac{2 \times 150 \times 100}{250} = 120$ km/hr