(A) :- Time & Distance :- <7>

1. (c) Train P can cover in (11-10) or 1 hr is 80 km.

∴ Remaining distance be → (300 − 80) km = 220 km

∴ Required time = $\left[\frac{220}{(80+40)}\right]$ hr = $\frac{220}{120} = \frac{11}{6}$ hr

= $1\frac{5}{6}$ hr = 1 hr 50 min

∴ 11 am + 1 hr 50 min = **12:50 Pm**

2. (d) Avg speed = $\frac{3}{\frac{1}{40}+\frac{1}{60}+\frac{1}{20}} = \frac{3}{\frac{3+2+6}{120}} = \boxed{\frac{360}{11}\text{ km/h}}$

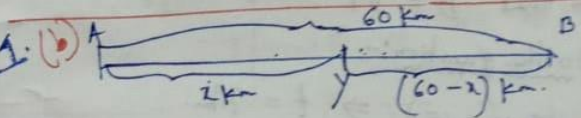
3. (a) Let the length of the train be l m.

∴ $(200+l) = \left(72 \times \frac{5}{18} \times 20\right) = 400$

⇒ $l = 200$ m

Now, $(200+200) = 72 \times \frac{5}{18} \times t$ ⇒ **$t = 20$ sec**

4. (b)



Now; AB = 60 km; Ay = x km and By = (60 − x) km

The distance covered by P is → (60 + 60 − x) km

= (120 − x) km.

∴ Time taken by P = $\frac{(120-x)}{10}$ hr

The distance covered by Q is → x km

Time taken by Q → $\frac{x}{5}$ hr

∴ According the question: $\frac{120-x}{10_2} = \frac{x}{5}$

⇒ $120 - x = 2x$

⇒ $3x = 120$

⇒ $x =$ **40 km**

5. (a) Let the total distance be 300 km.

$\therefore \frac{2}{3}$rd of the distance = 200 km

Then, remaining distance = 100 km.

$\therefore$ Total time = $\frac{200}{30} + \frac{100}{60} = \frac{25}{3}$ hrs.

$\therefore$ Avg speed = $\frac{300}{\left(\frac{25}{3}\right)}$ = **36 km/h**

6. (b) $D = \frac{V_1 \times V_2}{V_1 - V_2} \times \frac{t_1 + t_2}{60}$ [Here $V_1 > V_2$]

V = speed ; t = time and D = Distance

$\therefore D = \frac{40 \times 60}{(60-40)} \times \frac{20+10}{60}$

$= \frac{40 \times 60}{20} \times \frac{30}{60} =$ **60 km**

7. (a) We know that $D = VT$

$\therefore$ According to the question :-

$vt = \left(\frac{3}{5}v \times 15\right) \Rightarrow t = 9$ hr.

Hence, Saved **6 hrs**

8. (b) $\frac{\text{Ex. stopp} - \text{In. stopp}}{\text{Ex. stopp}} \times 60$

$= \left(\frac{60-48}{60}\right) \times 60 = \left(\frac{12}{60} \times 60\right) =$ **12 min**

9. (a) $W + W = 4 \Rightarrow W = 2$ hr.

$\therefore W + R = 3 \Rightarrow R = 1$ hr.

[Since ; W = Walk, R = Ride]

So ; to ride both direction ; it will take = (1+1)

= **2 hrs**

(A) :- Time & Distance :- ⟨9⟩

10. (c) In 5 hrs. P will cover 30 km. Now; at some distance 'x'. So P will cover x distance and Q will cover $(30+x)$.

∴ According to the question:

$$\frac{x}{3} = \frac{(30+x)}{4} \Rightarrow 4x = 90+3x \Rightarrow x = 90$$

∴ So; the distance start after which Q will catch P = $(90+30)$ = **120 km**

11. (c) If the time ratio be → a : b

Then the speed ratio is → $\sqrt{\frac{b}{a}}$

$$\therefore V_1 : V_2 = \sqrt{3\tfrac{20}{60} \div 4\tfrac{48}{60}} = \sqrt{\frac{10}{3} \div \frac{24}{5}}$$

$$V_1 : V_2 = \sqrt{\frac{10}{3} \times \frac{5}{24}} = \frac{5}{6}$$

∴ If 5 = 45 ⇒ then → 6 = **54 km/h**

1 = 9

12. (d) Let the respective length of 1st and 2nd train be l_1 m and l_2 m.

$\therefore l_1 = (3\times5)K = 15K$

$l_2 = (4\times10)K = 40K$

Now; $T = \frac{D}{V}$

$\Rightarrow T = \frac{(40+15)K}{(3K+4K)}$

$\Rightarrow T = \frac{65}{7} = 7\frac{6}{7}$ sec

(A) :- Time & Distance :- (10)

13. (c) 3 stops of 20 mins :→ $(3 \times 20) = 60 \text{ mins} = 1 \text{ hr}$

Let the actual time be x hr.

∴ According to the question: $45x = 40(x+1)$

$\Rightarrow \quad x = 8$

∴ Distance $= (45 \times 8) = \boxed{360 \text{ km}}$

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14. (a) Let the speed of the trains are x km/hr and y km/hr respectively.

$$\therefore \quad x + y = \frac{(115 + 100)}{5} \quad \left[\because V = \frac{D}{T}\right]$$

$$\Rightarrow \quad x + y = \frac{215}{5} = \frac{215}{5} \rightarrow (i)$$

then $x - y = \frac{(115 + 110)}{25} = \frac{225}{25} = 9 \rightarrow (ii)$

Solving eq^n (i) and eq^n (ii); We get → $x = \boxed{27 \text{ km/hr}}$

and $y = (45 - 27) \text{ k/hr} = \boxed{18 \text{ km/hr}}$

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15. (a) Total time = 2 days 8 hrs.

$= \{(2 \times 24) + 8 \text{ hr}\} = 56 \text{ hrs.}$

∴ Speed $= \left(\frac{3584}{56}\right) \text{ km/hr} = 64 \text{ km/hr.}$

Now; Remaining distance :→ $\{3584 - (1440 + 1608)\}$

$= 536 \text{ km}$

∴ Remaining time → (2 days 8 hr − 2 days)

$= 8 \text{ hrs.}$

∴ Speed of the remaining journey $= \left(\frac{536}{8}\right) \text{ k/h}$

$= 67 \text{ k/h}$

∴ Required answer : $(67 - 64) \text{ km/hr}$

$= \boxed{3 \text{ km/h}}$

(A) :- Time & Distance :- <11>

16. (c) Let the speed of the second train be x km/hr.

$\therefore D = VT \Rightarrow (60 - x) \times 18' = 120 \times \frac{18'}{5} \Rightarrow x = 36$

17. (c) Let the time be x hrs.

$\therefore$ According to the question:- $20x + 25(x-1) = 110$

$\Rightarrow 20x + 25x - 25 = 110 \Rightarrow 45x = 135 \Rightarrow x = 3$

$\therefore (7 \text{ am} + 3 \text{ hrs}) =$ **10 am**

18. (c) Time taken to cover 600 km is $\rightarrow \left(\frac{600}{100}\right)$ hr $= 6$ hrs.

No. of stoppages $= \left(\frac{600}{75}\right) - 1 = 7$

Total time $= \{6 \text{ hrs} + (3 \times 7)\} =$ **6 hrs 21 min**

19. (b) Distance $= \left(48 \times \frac{50}{60}\right) = 40$ km

New speed $= \left(\frac{40}{\frac{40}{60}}\right)$ km $\frac{D}{T} = \frac{40}{\frac{40}{60}} =$ **60 k/h**

20. (c) Relative speed $= (5.5 - 5)$ km/hr $= 0.5$ km/hr.

Time $= \frac{D}{V} = \frac{8.5}{0.5} =$ **17 hrs**

21. (b) Speed Ratio $= 7:1$

$\therefore$ Down stream $= (7x + x) = 8x$ k/h

Up-stream $= (7x - x) = 6x$ k/h

Up-stream speed $= \frac{4.2}{\left(\frac{14}{60}\right)} = \frac{42 \times 60}{10 \times 14} = 18$

$\therefore 6x = 18 \Rightarrow x = 3$; then $8x = 24$ k/h

Time taken to cover 17.6 km is $\rightarrow \frac{17.6}{\frac{24}{60}}$

$= \frac{176 \times 60}{10 \times 24} =$ **44 min**

(A) :- Time & Distance :- <12>

22. (a) Let the distance be x km.

$$\therefore \frac{x}{(4+1)} + \frac{x}{(4-1)} = 1 \Rightarrow \frac{8x}{15} = 1$$

$$\Rightarrow \frac{x}{5} + \frac{x}{3} = 1 \Rightarrow x = \frac{15}{8} = \boxed{1.8 \text{ km}}$$

23. (c) Let the speed of boat and stream are x k/h and y k/h.

$$\therefore \frac{3\cancel{x}}{(x+y)} = \frac{\cancel{4}}{(x-y)} \Rightarrow 2x = 4y$$

$$\Rightarrow 3x - 3y = x + y \Rightarrow x : y = \boxed{2:1}$$

24. (a) Let the speed of the stream = x k/h

$\therefore$ According to the question:-

$$\frac{30}{(8-x)} - \frac{30}{(8+x)} = \frac{120}{60}$$

$$\Rightarrow \frac{\cancel{30}^{15}}{1}\left[\frac{1}{8-x} - \frac{1}{8+x}\right] = \blacklozenge\, x$$

Now; putting the option (a); We get LHS = RHS.

$\therefore$ The required answer is $\boxed{2 \text{ km/hr}}$

25. (c) Let the speed of boat and the speed of current are x k/h and y k/h respectively.

$$\therefore x + y = \left(\frac{24}{4}\right) = 6 \longrightarrow (i)$$

$$x - y = \left(\frac{24}{6}\right) = 4 \longrightarrow (ii)$$

Solving eq^n(i) & eq^n(ii); We get $\rightarrow$ $x = \boxed{5 \text{ k/h}}$

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