TIME-DISTANCE-SPEED

Q1

$D = 233$ km

$V_Q = x$

$V_P = x+10$

→ Met at 75 minutes after Q started

→ Q dist $= x + \frac{x}{4}$

→ P distance $= 2(x+10) + \frac{(x+10)}{4}$

$$2x + 20 + \frac{x+10}{4} + x + \frac{x}{4} = 233$$

$$3x + 20 + \frac{2x+10}{4} = 233$$

$$12x + 80 + 2x + 10 = 233 * 4$$

$$14x + 90 = 233 * 4$$

$$14x = 233 * 4 - 90$$

$$x = \frac{842}{14}$$

$$x = 60.14$$

$$x + \frac{x}{4} \Rightarrow 60 + \frac{60}{4}$$

$$\Rightarrow 75 \text{ km}$$

Q2. 80 km/h
100 km/h

360
180
540

3 hrs ⇒ 10 AM

Q3. C_1 – 50 km/h
C_2 – 60 km/h

⇒ 60 − 50 ⇒ 10 km in hr

⇒ 20 km in 2 hrs

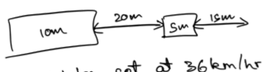
Q4.

$$\frac{2 * d}{\frac{d}{60} + \frac{d}{90}} \Rightarrow \frac{2 * 60 * 90}{60 + 90}$$

$$\Rightarrow \frac{2 * 60 * 90}{150}$$

$$\Rightarrow 72 \text{ km/hr}$$

Q5)



2 vehicles set at 36 km/hr

⇒ 50m at 36 km/hr

How many such 50m sets can go in 1 hr?

$\frac{5}{18} * 36 \Rightarrow 10$ m/s

50m ⇒ 5s

$\frac{3600 * 2}{5}$ ⇒ 1440//

5s → 2
3600s → ?

Q6.

$0.25C + 0.75W \Rightarrow 14$ km (2 hrs)

$0.5C + 0.5W \Rightarrow 26$ km (2 hrs)

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

$-0.5C + 0.5W \Rightarrow 26$

$0.5C + 1.5W \Rightarrow 38$

$1W \Rightarrow 12$

$0.75W \Rightarrow 9$ km

10 km C + 9 km W

$\Rightarrow \frac{10}{0.5} \Rightarrow \frac{100}{5} \Rightarrow 20$ km/hr

$\frac{9}{0.75} \Rightarrow \frac{3}{3} * \frac{4}{3} \Rightarrow 12$ km/hr

Equation takes C as velocity for 2 hrs not 1 hr ⇒ final velocity would be km/2hr

Q7.) $T_1 \rightarrow x \Rightarrow 120$ m

$T_2 \rightarrow y \Rightarrow 150$ m

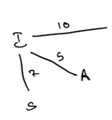
$S = \frac{D}{T}$

$x = \frac{120}{10} = 12$ m/s

$y = \frac{150}{15} = 10$ m/s

⇒ 12 m/s − 10 m/s ⇒ 2 m/s

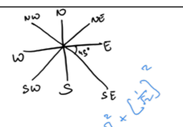
Q8.

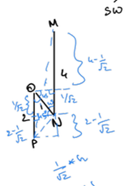


$x > 5$ & $x < 7$

6.02

Q9.





Q11) $V_P = 8$ km/hr

$V_D = x$ km/hr

$V_U = \frac{x}{3}$ km/hr

3 hr → x
1 hr → $\frac{x}{3}$

$S_S + S_U = x$

$S_S - S_U = \frac{x}{3}$

$2S_S = x + \frac{x}{3}$

$2S_S = \frac{4x}{3}$

$2x/3 + 8 = x$

$8 = x - 2x/3$

$24 = x$

$24 - 8 \Rightarrow 16$

$D = \frac{V}{T} \Rightarrow D = \frac{8+x}{T}$

$\Rightarrow D = \frac{8-x}{T/3}$

$\Rightarrow D = \frac{24-3x}{T}$

$\frac{8+x}{T} = \frac{24-3x}{T}$

$4x = 16$

$x = 4$//

GrA – GrQ – Profit loss

21. CP → x, SP → 1.1x | CP → 0.9x, SP → 1.1x − 132

$1.1x - 132 = 0.9x + 0.09x$

$1.1x - 0.99x = 132$

$0.11x = 132$

$x = 1200$

22.) CP = x

$CP_{dis} = 0.8x$

$\frac{1.04 - 0.8}{0.8} * 100$

$\frac{0.24}{0.8} * 100$

23. 150 → 200 | 150 → 120

⇒ 300 CP total

⇒ 320 SP total

$\frac{20}{320} * 100 = 6\% \uparrow$

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Working

Gr17

$xB + yT \rightarrow 8$

$2xB + 4yT \rightarrow 10$

$3yT \rightarrow 2$

$yT \rightarrow 2/3$

$xB \rightarrow 8 - \frac{2}{3}$

$xB \rightarrow \frac{22}{3}$

$xB + yT \rightarrow 8$

$0.5xB + 2yT \rightarrow 5$

1 day → $\frac{1}{8}(x+y)$

1 day → $\frac{1}{5}(0.5x + 2y)$

$-(x + y = 1/8)$

$0.5x + 2y = 1/5$

$y - 0.5x = \frac{3}{40}$

$y = \frac{3}{40} + 0.5x$

$x + \frac{3}{40} + 0.5x = 1/8$

$1.5x = \frac{1}{8} - \frac{3}{40}$

$= \frac{2}{40} = \frac{1}{20}$

$x \Rightarrow \frac{1}{30}$

Total days ⇒ 30

work/day

i.e. work per day

$x * \text{Bold} + y * \text{Total} \rightarrow 8$ days

$0.5x * \text{Bold} + 2y * \text{Total} \rightarrow 5$ days

Gr16

P, Q, R, S

Q → 12 * 25

$\left(\frac{1}{12 * 25}\right)$ → 1 hr

→ work done in 1 hr

R → 50 * 12

1 hr → $\frac{1}{12 * 50}$

R → 18 * 7 / hr

R → $\frac{7 * 18}{24 * 12 * 50}$

Q → $\frac{5 * 12}{12 * 25}$

$\frac{1}{5} : \frac{21}{20}$

⇒ 20 : 21

Gr19

X → 5 hr
Y → 4 hrs
Z (out) → 20 hrs

1 hr X → 1/5
1 hr Y → 1/4
1 hr Z → 1/20

$\frac{1}{5} + \frac{1}{4} - \frac{1}{20}$

$\frac{9}{20} - \frac{1}{20} \Rightarrow \frac{8}{20}$

1 hr → $\frac{2}{5}$

2.5 hrs//

Total hours: Reciprocal of

$\frac{8}{20} \Rightarrow \frac{20}{8}$

⇒ 2.5

1 hr
$P + Q + R = \frac{1}{6} + \frac{1}{9} - \frac{1}{12}$

1 hr
$P + R = \frac{1}{6} - \frac{1}{12} = \frac{1}{12}$

1 hr
$Q + R = \frac{1}{9} - \frac{1}{12} = \frac{1}{36}$

1 hr
$P + Q = \frac{1}{6} + \frac{1}{9} = \frac{5}{18}$

$4 * \left(\frac{1}{12}\right) + 6 * \frac{1}{36}$

$\frac{3}{6} \Rightarrow \frac{1}{2}$ [10 hrs]

Total for P+Q to finish full work $= \frac{18}{5}$

To finish half work (P+Q) $= \frac{18}{10} = 1.8$

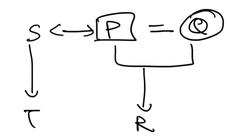
11.8//

Q works rest of the time.

To finish half work, Q takes 4.5

⇒ 10 + 4.5 ⇒ 14.5

Gr19



→ S could be SIL/BIL of Q

→ S is aunt of T? How??

→ S is brother/sister of P

→ S is aunt / uncle of R