Solutions

S1. Ans.(b)

Sol. Total runs made by running b/w wicket = 110 – 3 × 4 – 8 × 6 = 50

% = $\frac{50}{110} \times 100 = \frac{500}{11} = 45\frac{5}{11}\%$

S2. Ans.(c)

Sol. Marks of $1^{st} \rightarrow x$

Marks of $2^{nd} \rightarrow y$

x = y + a

x = $\frac{56}{100}$ (x + y)

y + a = $\frac{56}{100}$ (2y + a)

100y + 9 × 100 = 112y + 9 × 56

12y = 9 × 44

y = 33

x = 42

S3. Ans.(d)

Sol. number of students of 8 years age = 48

Number of students above 8 years of age = $\frac{2}{3} \times 48 = 32$

Let Number of students below 8 year of age → x

x = $\frac{20}{100}$ (48 + 32 + x)

100x = 1600 + 20x

x = 20

Total Students = 48 + 32 + 20 = 100

S4. Ans.(a)

Sol. Valid votes = $\frac{7500 \times 80}{100} = 6000$

Valid votes. That other Candidate got = 6000 × $\frac{45}{100}$ = 2700

S5. Ans.(b)

Sol. x = $\frac{120}{100}$y

x : y = 6 : 5

y = 550 × $\frac{5}{11}$ = 250

S6. Ans.(a)

Sol. The amount Paid = 6650 × $\frac{94}{100} \times \frac{110}{100}$ = 6876.10 Rs

S7. Ans.(c)

Sol. Fruits in good condition = $600 \times \frac{85}{100} + 400 \times \frac{92}{100} = 878$

% of fruit in good condition = $\frac{878}{1000} \times 100 = 87.8$

S8. Ans.(a)

Sol. $\frac{20}{100} \times a = b$

$a = 5b$

$b = \frac{a}{5}$

$b\%$ of $20 = \left(\frac{a}{5}\right)\% \times 20 = 4\%$ of a

S9. Ans.(b)

Sol. $\frac{x \times 90 \times 90 \times 90}{1000000} = 8748$

$x = 12000$ Rs

S10. Ans.(a)

Sol. Passing Marks = 125 + 40 = 165

$33\% \rightarrow 165$

$100\% \rightarrow 500$

S11. Ans.(c)

Sol. A + B + C's 1 hour efficiency = $\frac{1}{6}$

A + B + C's 2 hour work = $\frac{2}{6} = \frac{1}{3}$

Remaining work = $1 - \frac{1}{3} = \frac{2}{3}$

$\frac{2}{3}$ work done by A + B = 7

1 work A + B = $\frac{21}{2}$

$$A+B+C \Rightarrow 6 \quad 7$$

$$42$$

$$A+B \Rightarrow \frac{21}{2} \quad 4$$

Efficiency of C = 7 – 4 = 3

C alone will fill the tank in = $\frac{42}{3}$ = 14 hours

S12. Ans.(c)

Sol.

$$A \Rightarrow 10 \quad 18$$

$$B \Rightarrow 15 \quad 180 \quad 12$$

$$A+B-C \Rightarrow 18 \quad 10$$

A + B – C = 10

18 + 12 – C = 10

–C = 10 – 30

C = 20

C will empty the cistern in = $\frac{180}{20}$ = 9 hours

S13. Ans.(a)

Sol.

A ⇒ 20 15

B ⇒ 25 300 12

C ⇒ –30 –10

A + B + C ⇒ 15 + 12 – 10⇒ 17

3 hours work → 17

51 hours work → 289

Remaining work = 11

Now it's A's turn

Time taken by A = $\frac{11}{15}$

Total time = $51\frac{11}{15}$

S14. Ans.(c)

Sol. Efficiency of A = $\frac{1}{20}$

20% efficiency of A = $\frac{1}{20} \times \frac{20}{100} = \frac{1}{100}$

Efficiency → A : 20% Efficiency A = $\frac{1}{20} : \frac{1}{100} = 5 : 1$

Time Ratio → 1 : 5

1r → 20 minutes

5r → 100 minutes

1 pipe takes = 100 minutes

5 pipe will take = $\frac{100}{5}$ = 20 minutes

S15. Ans.(d)

Sol.

A ⇒ 40 3

B ⇒ 60 120 2

C ⇒ 30 4

3 minutes work = 3 + 3 + 3 + 2 + 4 = 15

24 minutes work = 15 × 8 = 120

S16. Ans.(d)

Sol.

A 8 3

24

B 12 2

Time = $\frac{24}{5} = 4\frac{4}{5}$ hours

With leak in the bottom the cistern will be full in $= 6 + 4\frac{4}{5} = 10\frac{4}{5}$

$\frac{1}{8}+\frac{1}{12}+\frac{1}{x}=\frac{5}{54}$

$\frac{1}{x}=\frac{5}{54}-\frac{1}{8}-\frac{1}{12}$

$\frac{1}{x}=\frac{20-27-18}{216}$

$\frac{1}{x}=\frac{-25}{216}$

$x=\frac{216}{25}$

S17. Ans.(c)

Sol.

	A	:	B
Efficiency →	6	:	1
Time →	1	:	6

$6r \rightarrow 28$

$1r \rightarrow \frac{14}{3}$

Total time

$=\frac{1}{28}+\frac{3}{14}$

$=\frac{1+6}{28}$

$=\frac{7}{28}$ = 4 minutes

S18. Ans.(d)

Sol.

$\frac{1}{10}+\frac{1}{15}+\frac{1}{x}=\frac{1}{18}$

$\frac{1}{x}=\frac{1}{18}-\frac{1}{15}-\frac{1}{10}$

$=\frac{10-12-18}{180}$

$x=\frac{180}{20}$ = 9 minutes

S19. Ans.(b)

Sol. A + Q

$\frac{1}{6}+\frac{1}{\text{Inlet}}=\frac{1}{8}$

$\frac{1}{\text{Inlet}}=\frac{1}{8}-\frac{1}{6}$

$\frac{1}{\text{Inlet}}=\frac{3-4}{24}$

Inlet ⇒ 24 hours

Capacity = 4 × 24 × 60 = 5760

S20. Ans.(b)

Sol. Let the filling capacity ⇒ x m^3

Emptying capacity ⇒ x + 10 m^3

$$\frac{2400}{x+10}-\frac{2400}{x}=8$$

$$\frac{x-x+10}{(x+10)\,x}=\frac{1}{300}$$

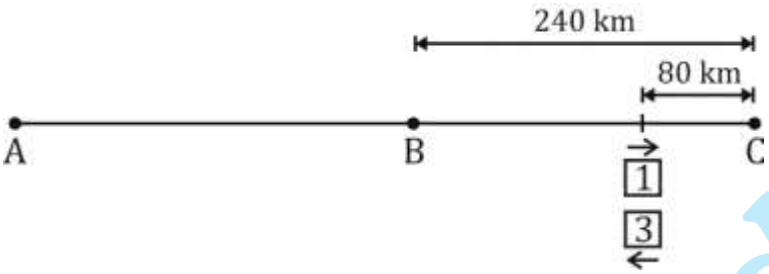
3000 = x (x + 10)

Using option (b)

50 × 60 = 3000 satisfies

S21. Ans.(a)

Sol.



Let speeds of car be V_1, V_2 & V_3

$$\frac{AB}{V_1}-\frac{AB}{V_2}=\frac{AB}{V_2}-\frac{AB}{V_3} \quad \ldots (i)$$

$$\frac{240}{V_1}-\frac{240}{V_2}=1 \quad \ldots (ii)$$

In BC car 1 travels 160 km before meeting Car 3 & Car 3 travels 320 km before meeting car 1

$$\therefore V_3 = 2V_1 \left[\frac{320}{V_3}=\frac{160}{V_1}\right]$$

From equation (i)

$$\frac{1}{V_1}-\frac{1}{V_2}=\frac{1}{V_2}-\frac{1}{2V_1}$$

$$\frac{1}{V_1}+\frac{1}{2V_1}=\frac{1}{V_2}+\frac{1}{V_2}$$

$$\frac{3}{2V_1}=\frac{2}{V_2},\ V_2=\frac{4}{3}V_1$$

From (ii)

$$\frac{240}{V_1}-\frac{240}{\frac{4}{3}V_1}=1,\ \frac{240}{V_1}-\frac{180}{V_1}=1$$

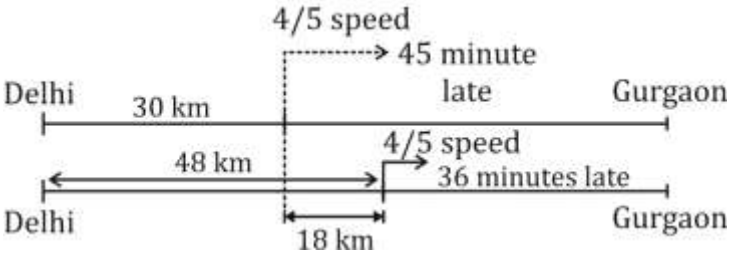
V_1 = 60

V_3 = 2 × V_1= 2 × 60 = 120

Difference = 120 – 60 = 60

S22. Ans.(b)

Sol.



18 km travelled with $\frac{4}{5}$ speed – 18 km travelled with usual speed = 45 – 36

$$\frac{18}{\frac{4}{5}s} - \frac{18}{s} = \frac{9}{60}$$

$$18\left(\frac{5-4}{4s}\right) = \frac{9}{60}$$

$$\frac{18 \times 1}{4s} = \frac{9}{60}$$

s = 30 km/hr

d = 30 × T

T = d/30

$$\frac{30}{30} + \frac{(d-30)}{30 \times \frac{4}{5}} = T + \frac{45}{60}$$

$$1 + \frac{(d-30)}{24} = \frac{d}{30} + \frac{3}{4}$$

d = 120 km

S23. Ans.(d)

Sol. Let the distance be x miles.

When Tom meets Jerry

distance travelled by Tom = x + 9

distance travelled by Jerry = x – 9

$\frac{x+9}{T} = \frac{x-9}{J}, \frac{T}{J} = \frac{x+9}{x-9}$

When Jerry meets Bill.

Distance travelled by Jerry= x + 7

Distance travelled by Bill = x – 7

$\frac{x+7}{J} = \frac{x-7}{B}, \frac{J}{B} = \frac{x+7}{x-7}$

3T = 5B [Given]

$$\frac{T}{B} = \frac{5}{3}$$

$$\frac{T}{J} \times \frac{J}{B} = \frac{5}{3}$$

$$\frac{(x+9)}{(x-9)} \times \left(\frac{x+7}{x-7}\right) = \frac{5}{3}$$

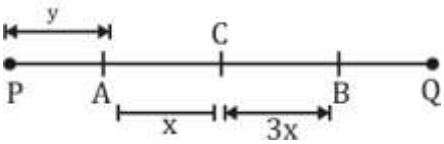
$5(x-9)(x-7) = 3(x+9)(x+7)$
$5x^2 - 80x + 315 = 3x^2 + 48x + 189$
$2x^2 - 128x + 126 = 0$
$x^2 - 64x + 63 = 0$
$x = 63$ or 1
$x = 63$

S24. Ans.(c)
Sol. Ratio of distance covered by second train to first train = 125 : 1= 5 : 4
Time is same
So, ratio of speeds = 5 : 4
Speed of second train = $40 \times \frac{5}{4}$= 50 km/hr
Distance covered by 1st train in half an hour = 20 km
Let 3rd train takes 't' hours to overtake 1st train & speed of 3rd train → x km/hr
$t = \frac{20}{x-40}$ ...(ii)
Distance covered by 2nd train in half an hour = 25 km
$t + \frac{3}{2} = \frac{25}{x-50}$ ... (i)
From (i) & (ii)
x = 60 km/hr

S25. Ans.(b)
Sol. Total distance travelled by both the trains before meeting = D
This distance will be covered in proportion of their speeds.
3 hours after meeting distance travelled by
$A = 3 \times S_A$
$B = 3 \times S_B$
$3S_A + 3S_B = 675$
$S_A + S_B = 225$
Remaining distance to be covered by 1st train $= \frac{DS_B}{S_A+S_B}$
Time taken $\Rightarrow \frac{DS_B}{(S_A+S_B)S_A} = 16$ ... (i)
Remaining Distance covered by second train$= \frac{DS_A}{(S_A+S_B)}$
Time taken $\Rightarrow \frac{DS_A}{(S_A+S_B)S_A} = 25$ ... (ii)
Dividing (i) by (ii)
$\frac{S_A^2}{S_B^2} = \frac{25}{16}$
$S_A = \frac{5}{4}S_B$, $S_A + \frac{4}{5}S_A = 225$
$S_A = 125$
$S_B = 100$
From (i)
Time $= \frac{D}{S_A} = 16 \times \frac{225}{100}$= 36 h

S26. Ans.(b)

Sol.



Speed of Bus → b

Speed of Man → m

When the bus goes from P to A, the man goes from C to A

Time taken by both are equal

$\therefore \frac{y}{b} = \frac{x}{m}$

$\frac{b}{m} = \frac{y}{x}$ ....(1)

When Bus goes from P to B, the man goes from C to B, Again time taken by both are equal.

$\frac{y + x + 3x}{b} = \frac{3x}{m}$

$\frac{b}{m} = \frac{y+x+3x}{3x}$ ....(2)

From (1) & (2)

$\frac{y}{x} = \frac{4x + y}{3x}$

$3y = 4x + y$

$2y = 4x$

$y = 2x$

From (1)

$\frac{b}{m} = \frac{2x}{x}$

$b = 2m$

S27. Ans.(a)

Sol. Speed of car A = a

Speed of car B = b

Let they meet after t minutes.

Distance travelled by car A before meeting car B = a × t

Distance travelled by car B before meeting car A = b × t

Distance travelled by car A after meeting car B = 54 a

Distance travelled by car B after meeting car A= 24 b

Distance travelled by car A after crossing car B = Distance travelled by car B before crossing car A (vice versa)

at = 54 b ....(1)

bt = 24 a ...(2)

Multiplying (1) & (2)

$abt^2 = 54 \times 24 \times ab$

$t^2 = 54 \times 24$

t = 36 minutes

Both cars travelled 36 minutes before meeting

Time taken By B = 24 + 36 = 60 minutes.

S28. Ans.(a)

Sol. Train Car

240 210 = 8 h 40 min.

180 270 = 9 h

To travel extra 60 km by car increase in time = 20 min

So, travel extra 240 km by car increase in time = 80 min

∴ 450 km by car in = 8 h 40 min + 80 min = 10 h

Speed of car = 450/10 = 45 km/h

S29. Ans.(d)

Sol. Let length → x meters

speed of B → y kmph

$$27 = \frac{x + 500}{(63 + y)}$$

$$\frac{27}{3600} = \frac{x + 0.5}{63 + y} \ldots(1)$$

$$\frac{162}{3600} = \frac{x + 0.5}{(36 - y)} \ldots(2)$$

Form (1) & (2)

$$\frac{27}{3600} \times (63 + y) = \frac{162}{3600} \times (63 - y)$$

63 + y = 6 (63–y)

63 + y = 378 – 6y

7y = 315

y = 45 km

$$\frac{27}{3600} = \frac{x + 0.5}{108}$$

0.81 = x + 0.5

x = 0.31 km = 310 m

S30. Ans.(b)

Sol.

$$\frac{D}{x - 15} - \frac{D}{x} = 45 \ldots(1)$$

$$\frac{D}{x} - \frac{D}{x + 10} = 20 \ldots(2)$$

Form (1) & (2)

We will get D = 9750 km.