

S1. Ans.(b)

Sol.

Speed of first train = 60 km/h

Total distance = 480 km

Time taken by first train to cover that distance without stoppage

$$= \frac{480}{60} = 8h$$

9 station \times 5 minute = Total stoppage time

$$= 45 \text{ minute}$$

Train took total time to reach Lucknow

$$= 8 \text{ hr } 45 \text{ minute} = \frac{35}{4} \text{ hour}$$

2nd Train reach 30 min. before it start 2 hour late from Delhi

So,

Time taken by 2nd train = 8 h 45 min – 2h

$$- 30 \text{ min.}$$

$$= 6 \text{ hour } 15 \text{ minute}$$

$$= 6 \frac{1}{4} = \frac{25}{4} \text{ hour}$$

$$\text{Speed of 2nd Train} = \frac{480 \times 4}{25} = \frac{384}{5} \text{ km/h}$$

$$\text{Required Speed ratio of train} = \frac{60}{\frac{384}{5}} = 25:32$$

S2. Ans.(d)

Sol.

Let Purvi's investment = Rs. 100x

Charu investment = Rs. 80x

Rinki investment = Rs. 56x

ATQ,

Ratio between profit Share of Purvi : Charu : Rinki

$$= \left(100x \times 8 + 100x \times \frac{4}{5} \times 4\right) : \left(80x \times 8 + 80x \times \frac{3}{5} \times 4\right) : \left(56x \times 8 + 56x \times \frac{5}{7} \times 4\right)$$

$$= 35 : 26 : 19$$

Let total profit = Y Rs.

ATQ,

$$\frac{26y}{80} - \frac{19y}{80} = 2800$$

$$Y = 32000$$

Total profit share of Charu and Purvi

$$= \frac{(35 + 26)}{80} \times 32000$$

$$= 24400 \text{ Rs.}$$

S3. Ans.(d)

Sol.

For vessel A –

$$\text{Petrol taken out} = \frac{7P}{12} \text{ liters}$$

$$\text{Kerosene oil taken out} = \frac{5P}{12} \text{ liters}$$

For vessel B-

$$\text{Kerosene oil taken out} = \frac{5Q}{13} \text{ liters}$$

In vessel C-

Kerosene oil =

$$\frac{5P}{12} + \frac{5Q}{13} = \frac{150 \times 40}{100}$$
$$\frac{65P + 60Q}{156} = 60$$

$$13P + 12Q = 1872 \text{ ---(I)}$$

Petrol in vessel C

$$\frac{7P}{12} + \frac{8Q}{13} = \frac{150 \times 60}{100}$$
$$\frac{91P + 96Q}{156} = 90$$

$$91P + 96Q = 14040 \text{ ---(II)}$$

From (I) and (II) _____

$$Q = 78$$

$$P = 72$$

$$\frac{P}{Q} = \frac{72}{78}$$

$$= \frac{12}{13}$$

S4. Ans.(d)

Sol.

A got 40% of profit

B & C got 30% each

So, investment ratio of A, B and C is 4 : 3 : 3

Now,

They earn 10% profit

$$\Rightarrow \frac{10x \times 10}{100} = x$$

If they earn 15% profit

$$= \frac{10x \times 15}{100} = \frac{3}{2}x$$

A got 900 Rs. more

$$\Rightarrow \frac{3}{2}x \times \frac{40}{100} - \frac{x \times 40}{100} = 900$$

$$\Rightarrow x = 4500$$

Total investment = 45000

$$\text{B's investment} = \frac{45000 \times 3}{10}$$
$$= 13500$$

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S5. Ans.(d)

Sol.

Let usual speed of boat in still water = x

River speed = y

ATQ,

$$\frac{(x - y)250}{100} = (2x - y)$$

$$5x - 5y = 4x - 2y$$

$$x = 3y$$

Now,

$$\frac{60}{x - y} + \frac{60}{x + y} = 22.5$$

$$\frac{60}{2y} + \frac{60}{4y} = 22.5$$

$$y = 2 \text{ km/hr}$$

$$x = 6 \text{ km/hr}$$

$$\text{Required time} = \frac{80}{6 + 2} = 10 \text{ hr}$$

S6. Ans.(b)

Sol.

Hence

$$2W = 3M = 4C$$

$$\therefore (14W + 12M + 12C) = 14 + 8 + 6 = 28 \text{ Women}$$

$$\text{Total Unit of work} = 28 \times 24$$

$$\therefore 28 \times 24 = x \times 14$$

$$x = 48$$

Total no. of women required for additional labour

$$= 48 - 28 = 20 \text{ women}$$

S7. Ans.(a)

Sol.

$$SI = \frac{43,892 \times 30 \times 3}{100} = 43892 \left[\frac{9}{10} \right]$$

$$CI = 43892 \left[\left(1 + \frac{30}{100} \right)^3 - 1 \right] = 43892 \left(\frac{2197 - 1000}{1000} \right) = 43892 \left(\frac{1197}{1000} \right)$$

$$\therefore CI - SI = 43892 \left(\frac{297}{1000} \right)$$

$$\text{Desired\%} = \frac{43892 \left(\frac{297}{1000} \right)}{43892 \left(\frac{900}{1000} \right)} \times 100 = 33\%$$

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S8. Ans.(b)

Sol.

$$\text{Total \% spend} = (50 + 25 + 12.5 + 5) = 92.5\%$$

$$\therefore 7.5\% = 900$$

$$1\% = \frac{900}{7.5}$$

$$100\% = \frac{900}{7.5} \times 100 = 12000 \text{ rupees}$$

S9. Ans.(c)

Sol.

$$\text{Cost price for retailer} = 30.09 \times \frac{4}{5} = 24.072$$

$$\text{Cost price for manufacturer} = 24.072 \times \frac{100}{120} \times \frac{100}{118}$$

$$= 24.072 \times \frac{5}{6} \times \frac{50}{59}$$

$$= 17$$

S10. Ans.(b)

Sol.

$$\text{Total selling price} = 7200 \times 10 = 72000$$

$$\text{Total no. of pencils manufactured} = 7200 \times \frac{10}{9} = 8000$$

$$\text{Total cost price of pencils} = 72000 \times \frac{100}{125} = 57600$$

$$\text{Cost of each pencils} = \frac{57600}{8000} = 7.2$$

S11. Ans.(b)

Sol.

$$\text{Amount for tuition fee} = \frac{3}{5} \times 1720$$

$$= 1032$$

Let, A's monthly salary is Rs x

$$\therefore \frac{40}{100}x \times \frac{80}{100} = 1720 + 1032$$

$$\Rightarrow x = \frac{2752 \times 100}{32}$$

$$\Rightarrow x = \text{Rs } 8600$$

S12. Ans.(d)

Sol.

Let Muskaan Salary $\rightarrow 100x$

$$\text{Amount she gives to Simran} = \frac{100x \times 20}{100} = 20x$$

$$\text{Money invested by Simran} = \frac{20x \times 60}{100} = 12x$$

$$\text{Interest earned after 2 years} = 12x \left[\left(1 + \frac{20}{100} \right)^2 - 1 \right] = 6600$$

$$\Rightarrow x = 1250$$

$$\text{Salary of Muskaan} = 1250 \times 100 = 125000$$

S13. Ans.(b)

Sol.

Let amount = P

$$\text{Difference of Interest of CI and SI in 2 years} = \frac{Pr^2}{(100)^2}$$

$$r = 12\%$$

$$\Rightarrow \frac{P \times 12 \times 12}{(100)^2} = 144$$

$$\Rightarrow P = 10000$$

$$\text{Simple interest in 4 years with 15\% p.a.} = \frac{10000 \times 15 \times 4}{100} = 6000$$

S14. Ans.(d)

Sol.

Let time taken by Raman to cover the distance with the speed of 15 km/h is 't' hours

$$\text{So total distance} = 15 \times t$$

Let his changed speed = x km/hr

$$\text{So, distance} = x \times (t + 3)$$

$$\text{Now} \rightarrow 15t = x(t + 3) \quad \dots(i)$$

When he increases its changed speed by 80%

$$\Rightarrow \frac{x \times 180}{100} = 1.8x \text{ km/hr}$$

$$\Rightarrow 15t = 1.8x(t - 1) \quad \dots(ii)$$

Equating (i) & (ii)

$$x(t + 3) = 1.8x(t - 1)$$

$$t = 6$$

$$\text{So, } x = 10$$

$$\text{Required speed} = 10 \times 1.8 = 18 \text{ km/hr}$$

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S15. Ans.(d)

Sol.

$$\text{For first two years total S.I} = 15 \times 2 \\ = 30\%$$

$$\text{For next two years total C.I on } (15+5)\% \\ = 20+20+\frac{20 \times 20}{100} \\ = 44\%$$

Amount after two year

$$= P + \frac{P \times 30}{100} \\ = \text{Rs. } \frac{13P}{10}$$

Amount after 4 years

$$\frac{13P}{10} \times \frac{144}{100} = 17971.2$$

$$P = \frac{17971.2}{1.872}$$

$$P = \text{Rs. } 9600$$

S16. Ans.(d)

Sol.

Let cost price of article A Rs. $112x$ and cost price of article B Rs. $135x$
ATQ,

Selling price of article A

$$= \frac{112x}{4} \times 5$$

$$= 140x \text{ Rs.}$$

Selling price of article B

$$= \frac{135x}{4} \times 5$$

$$= 168.75x \text{ Rs.}$$

Let mark price of article A is $7y$

And article B is $9y$

$$140x = 7y \times \left(\frac{100-d}{100}\right) \text{ ---(I)}$$

$$168.75x = 9y \times \left(\frac{100-(d+5)}{100}\right) \text{ ---(II)}$$

From (I) and (II) _____

$$\frac{140x}{168.75x} = \frac{7y \times \left(\frac{100-d}{100}\right)}{9y \times \left(\frac{95-d}{100}\right)}$$

$$\frac{140 \times 9}{168.75 \times 7} = \frac{100-d}{95-d}$$

$$\frac{16}{15} = \frac{100-d}{95-d}$$

$$16d - 1520 = 15d - 1500$$

First discount $d = 20\%$

Second discount = $(20 + 5) = 25\%$

S17. Ans.(a)

Sol.

$$1^{\text{st}} \text{ alloy zinc} = \frac{2}{5} \times 15 = 6$$

$$\text{Copper} = \frac{3}{5} \times 15 = 9$$

Let copper to be removed = x

Then,

$$\frac{6 + 10}{9 - x} = \frac{4}{1}$$

$$\Rightarrow 16 = 36 - 4x$$

$$\Rightarrow x = 5 \text{ gm}$$

S18. Ans.(b)

Sol.

Let speed of Train 'X' = x

$$\Rightarrow \text{Speed of train 'Y'} = \frac{(100+100)}{100} \times x = 2x$$

Let, length of train 'X' = y

$$\Rightarrow \text{Length of train 'Y'} = \frac{150}{100} \times y = 1.5y$$

ATQ,

$$2 = \frac{y}{x} \Rightarrow y = 2x$$

$$\text{Required time} = \frac{1.5y+y}{2x-x} = \frac{2.5y}{x} = \frac{2.5 \times 2x}{x} = 5 \text{ seconds}$$

S19. Ans.(d)

Sol.

Let, total students in class 'A' = x

$$\Rightarrow \text{Number of Students in class 'B'} = 30 - x$$

ATQ,

$$\frac{30x}{36(30 - x)} = \frac{100}{180}$$

$$\Rightarrow \frac{x}{30 - x} = \frac{5}{9} \times \frac{36}{30}$$

$$\Rightarrow 3x = 2(30 - x) \Rightarrow x = 12$$

$$\Rightarrow \text{Total number of students in class 'B'} = 30 - 12 = 18$$

S20. Ans.(c)

Sol.

Let the amount Anushka initially has = x

ATQ,

$$\frac{x}{2} \left[\left(1 + \frac{10}{100} \right)^2 - 1 \right] + \frac{x}{2} \left[\left(1 + \frac{20}{100} \right)^2 - 1 \right] = 5200$$

$$\frac{x}{2} \left[\frac{21}{100} \right] + \frac{x}{2} \left[\frac{44}{100} \right] = 5200$$

$$\frac{65x}{200} = 5200$$

$$\Rightarrow x = \frac{5200 \times 200}{65} = 16000$$

S21. Ans.(d)

Sol.

Let the length of train A be L m and speed is a m/s.

& the length of train B will be L + 17 m and speed is b m/s.

ATQ,

$$\frac{2L+17}{a+b} = 2.6 \dots(i)$$

$$\frac{2L+17}{a-b} = 13 \dots(ii)$$

For train A

$$\frac{L}{2} = a \Rightarrow L = 2a$$

Put L=2a in (i) and (ii)

$$\frac{4a+17}{a+b} = 2.6 \dots(iii)$$

$$\frac{4a+17}{a-b} = 13 \dots(iv)$$

On solving (iii) and (iv),

$$a = 51 \text{ m/s}$$

$$\text{and, } b = 34 \text{ m/s}$$

$$\text{Hence sum of speed} = 51 + 34 = 85 \text{ ms}^{-1}$$

S22. Ans.(b)

Sol.

Let speed of train X and Y are 5x and 6x respectively.

Length of tunnel $\rightarrow 130 + 145 = 275 \text{ m}$.

Speed of trains per second

$$= \frac{275}{10} = 27.5 \text{ m/s}$$

$$5x + 6x = 27.5$$

$$x = 2.5$$

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speed of train X \rightarrow 12.5 m/s

Speed of train Y \rightarrow 15 m/s

Distance cover by train X in tunnel = $12.5 \times 10 = 125$ m.

Length of train X leaves out = $130 - 125 = 5$ m

$$\text{Required\%} = \frac{5}{130} \times 100 = 3\frac{11}{13}\%$$

S23. Ans.(c)

Sol.

$$\text{A can fill alone in} = \frac{20 \times (5 + 4)}{5} = \frac{180}{5} = 36 \text{ days}$$

$$\text{B can fill alone in} = \frac{20 \times (5 + 4)}{4} = \frac{180}{4} = 45 \text{ days}$$

According to question

$$\frac{4}{20} + \frac{9}{36} + \frac{9}{C} = 1$$

$$\frac{9}{C} = \frac{11}{20}$$

$$C = \frac{180}{11} \text{ hour}$$

S24. Ans.(a)

Sol.

Let he bought 'n' number of mobiles at the CP of Rs. x each

\therefore Total CP = Rs nx

ATQ,

$$\frac{60}{100} n \times \left[1 + \frac{3.5}{100} \right] + \frac{40}{100} n(6660) = nx \left[1 + \frac{6.5}{100} \right]$$

$$\Rightarrow \frac{6}{10} nx \left[\frac{207}{200} \right] + (4 \times 666) n = nx \left[\frac{213}{200} \right]$$

$$\Rightarrow (4 \times 666)n = nx \left[\frac{213}{200} - \frac{6 \times 207}{2000} \right] = nx \left(\frac{2130 - 1242}{2000} \right)$$

$$\Rightarrow x = \frac{4 \times 666 \times 2000}{888} \\ = \text{Rs } 6000$$

\therefore SP of each mobile which was sold at 3.5 % profit = $6000 \times \frac{207}{200} = \text{Rs } 6210$

S25. Ans.(c)

Sol.

$$A \rightarrow x + 5 \text{ hr}$$

$$B \rightarrow x \text{ hr}$$

$$C \rightarrow x - 4 \text{ hr}$$

According to question,

$$\frac{1}{x+5} + \frac{1}{x} = \frac{1}{x-4}$$

$$\Rightarrow \frac{2x+5}{x(x+5)} = \frac{1}{x-4}$$

$$\Rightarrow x^2 - 8x - 20 = 0$$

$$\Rightarrow x = 10 \text{ hr}$$

∴ Time required by first pipe = 15 hrs.

S26. Ans.(c)

Sol.

Invest in scheme A = Rs. x

in scheme B = Rs. y

ATQ,

$$x + y = 4200 \dots(i)$$

$$x \times 88\% - y \times 21\% = 1516$$

$$\therefore 88x - 21y = 151600 \dots(ii)$$

On solving

$$x = \text{Rs. } 2200$$

$$y = \text{Rs. } 2000$$

S27. Ans.(a)

Sol.

Let P = Panchhi's present age

S = Son's age

D = Daughter's age

ATQ,

$$P - 8 = S + D \dots(i)$$

$$\& P + 7 = 3S$$

$$\Rightarrow P = 3S - 7$$

$$\Rightarrow 2S - D = 15 \dots(ii)$$

$$\text{now, } \frac{D+5}{S+5} = \frac{7}{6}$$

$$\Rightarrow 7S - 6D = -5 \dots(iii)$$

Solving equations (ii) & (iii) we get,

$$D = 23 \text{ years.}$$

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S28. Ans.(b)

Sol.

Let Shobha and Saurabh have Rs. $100x$

Equivalent CI for two years at the rate of 10%

$$= 10 + 10 + \frac{10 \times 10}{100}$$

$$= 21\%$$

ATQ—

$$100x \times \frac{21}{100} = 100x \times \frac{2}{3} \times \frac{R \times 2}{100} + 100x \times \frac{1}{3} \times \frac{6.5 \times 2}{100}$$

$$21x = \frac{4x \times R}{3} + \frac{13x}{3}$$

$$63x = 4x \times R + 13x$$

$$4x \times R = 50x$$

$$R = \frac{50x}{4x}$$

$$R = 12.5\%$$

S29. Ans.(b)

Sol.

Let cost price of each pencil = 100

Then cost price of each pen = 200

Let 'x' is percentage of loss and profit

Now,

$$\text{Profit on selling 10 pencils} = 10 \times \left(\frac{100 \times x}{100} \right) = 10x$$

Profit on selling 10 pencils is equal to selling price of 3 pens

$$\Rightarrow \text{selling price of each pen} = \frac{10x}{3}$$

Now loss on selling 10 pens

$$10 \times \left(\frac{200 \times x}{100} \right) = 20x$$

Loss equal to the selling price of 4 pencils

Selling price of each pencil = $5x$

$$\text{Required Ratio} = \frac{5x \times 3}{10x} = 3 : 2$$

S30. Ans.(c)

Sol.

Let speed be x km/hr and distance be D .

$$\frac{90}{\frac{3}{4}x} - \frac{90}{x} = \frac{1}{2}$$

$$\Rightarrow \frac{(4-3)}{3x} = \frac{1}{180}$$

$$\Rightarrow x = 60 \text{ km/hr}$$

Now,

$$\frac{3}{2} + \frac{D-60}{45} - \frac{D}{60} = \frac{7}{2}$$

$$\Rightarrow D + 30 = 630$$

$$\Rightarrow x = 600 \text{ km}$$



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