1

(a) If A's share is 1, B's share $= \frac{5}{9} \times 1 = \frac{5}{9}$

C's share $= \frac{7}{10} \times \frac{5}{9} = \frac{7}{18}$;

D's share $= \frac{1}{3}\left(\frac{5}{9} + \frac{7}{18}\right) = \frac{17}{54}$

$\therefore A : B : C : D = 1 : \frac{5}{9} : \frac{7}{18} : \frac{17}{54}$

$= 54 : 30 : 21 : 17.$

$\therefore A$'s share $= \frac{54}{122} \times 1220 = ₹540.$

2

(a) Ratio of capitals of A, B and C
$= (15000 \times 3) : (40000 \times 9) : (30000 \times 6)$
$= 1 : 8 : 4$

B's share $= ₹\left(\frac{8}{13} \times 7800\right) = ₹\ 4800$

3

(a) $7 : 16 : 21$

4

(b) Let us represent their shares by the corresponding letter of their names.
$A + B = 2C$ and $B + C = 3A.$
$\Rightarrow A + 3A - C = 2C$ (since $B = 3A - C$)
$4A = 3C \Rightarrow A : C = 3 : 4$

5

(b) Let r be the 4$^{\text{th}}$ proportional.

Then $\frac{12X^3}{9aX^2} = \frac{8a^3X}{r} \Rightarrow r = 6a^4$

6

(d) $\frac{a}{b} = \frac{9}{6} = 3 : 2 = 15 : 10$

$\frac{b}{c} = \frac{10}{9} = 10 : 9$

Hence, $a : b : c = 15 : 10 : 9$

7

(b) Let A, B and C be the first, second and third nos. respectively.
Then, $A:B=2:3$ and $B:C=5:8$
Consider, $A:B=2:3=2\times5:3\times5=10:15$
and $B:C=5:8=5\times3:8\times3=15:24$
$\therefore$ $A:B:C=10:15:24$
Let the reqd. number be $10x$, $15x$ and $24x$.
Given, sum of three numbers $=98$
$\therefore$ $10x+15x+24x=98$
$\Rightarrow 49x=98 \Rightarrow x=2$
$\Rightarrow$ Second number $=15x=15\times2=30$

8

(c) Let the third type of tea is priced at ₹ x per kg. Also suppose that the three types of tea mixed together are 1, 1 and 2 kg, respectively.

Now, $\dfrac{126\times1+135\times1+2x}{1+1+2}=153$

$\Rightarrow \dfrac{261+2x}{4}=153 \Rightarrow 261+2x=612$

$\Rightarrow x=\dfrac{351}{2}=$ ₹ 175.5 per kg.

9

(c) Let the incomes of two companies A and B be $5x$ and $8x$ respectively.
From the question,

$\dfrac{5x+25}{8x}=\dfrac{5}{4} \Rightarrow 20x+100=40x \ \therefore \ x=5$

$\therefore$ Income of company $B=8x=$ ₹ 40 lakh

10

(b) $3:4:5$

11

(d) Let B puts $= x$ cows
then amount paid by

$B = \dfrac{3}{2} \times$ amount paid by A.

$\therefore \dfrac{80 \times 7}{x \times 3} = \dfrac{\text{amount paid by } A}{3/2 \times \text{amount paid by } A}$

$\Rightarrow x = \dfrac{80 \times 7 \times 3}{3 \times 2} = 280$ cows

12

(b) Given $A + B + C = 4898$ .... (i)

Also $B = \dfrac{120}{100} A$ and $B = \dfrac{125}{100} C$

$\therefore$ By (i), $\dfrac{100}{120} B + B + \dfrac{100}{125} B = 4898$

$\Rightarrow B = \dfrac{4898 \times 30}{79} = ₹1,860$

13

(a) Let the basic salary of A be ₹ x and that of B be ₹ y.

Now, $x \times \dfrac{65}{100} = y \times \dfrac{80}{100} \Rightarrow x : y = 16 : 13$

14

(d) Let $A = 2x$, $B = 3x$ and $C = 4x$. Then,

$\dfrac{A}{B} = \dfrac{2x}{3x} = \dfrac{2}{3}, \dfrac{B}{C} = \dfrac{3x}{4x} = \dfrac{3}{4}$ and $\dfrac{C}{A} = \dfrac{4x}{2x} = \dfrac{2}{1}$

$\Rightarrow \dfrac{A}{B} : \dfrac{B}{C} : \dfrac{C}{A} = \dfrac{2}{3} : \dfrac{3}{4} : \dfrac{2}{1} = 8 : 9 : 24.$

15

(d) Let $A = 2x$, $B = 3x$ and $C = 4x$. Then,

$\dfrac{A}{B} = \dfrac{2x}{3x} = \dfrac{2}{3}, \dfrac{B}{C} = \dfrac{3x}{4x} = \dfrac{3}{4}$ and $\dfrac{C}{A} = \dfrac{4x}{2x} = \dfrac{2}{1}$

$\Rightarrow \dfrac{A}{B} : \dfrac{B}{C} : \dfrac{C}{A} = \dfrac{2}{3} : \dfrac{3}{4} : \dfrac{2}{1} = 8 : 9 : 24.$

16

Let the fourth proportional to 5, 8, 15 be x.
$\therefore 5 : 8 :: 15 : x \Rightarrow 5x = (8 \times 15) \Rightarrow x = 24.$

17

(b) Let income of A = ₹ 3x, income of B = ₹ 2x
and expenditure of A = ₹ 5y,
expenditure of B = ₹ 3y
Now, saving = income − expenditure
∴ 3x − 5y = 2x − 3y = 200
⇒ x = 2y and y = 200 ⇒ x = 400
∴ A's income = ₹ 1200

18

(d) New ratio of their respective salaries

$$= 3 \times \frac{150}{100} : 5 \times \frac{160}{100} : 7 \times \frac{150}{100} = 9 : 16 : 21$$

19

(a) Let the required days be x.
More men, less days (Indirect proportion)
More size, more days (Direct proportion)

$$\left. \begin{array}{ll} \text{Men} & 20 \qquad\qquad 12 \\ \text{size} & 100 \times 3 \times 0.5 \quad 60 \times 4 \times 0.25 \end{array} \right\} :: 25 : x$$

∴ 20 × 100 × 3 × 0.5 × x = 12 × 60 × 4 × 0.25 × 25
⇒ x = 6 days

20

(c) Let the required number of days be x.
Less cows, More days (Indirect proportion)
Less bags, Less days (Direct proportion)

$$\left. \begin{array}{ll} \text{Cows} & 1 : 40 \\ \text{Bags} & 40 : 1 \end{array} \right\} :: 40 : x$$

∴ 1 × 40 × x = 40 × 1 × 40 ⇒ x = 40.

21

(c) Let number of ladies = x
then, number of gents = 2x

Now, $\dfrac{x-2}{2x-2} = \dfrac{1}{3} \Rightarrow 3x - 6 = 2x - 2$

⇒ x = 4
∴ Total number of people originally
present = 4 + 8 = 12

22

(b) Ratio of sides = $\dfrac{1}{2} : \dfrac{1}{3} : \dfrac{1}{4} = 6 : 4 : 3$

Largest side = $\left(104 \times \dfrac{6}{13} \right)$ cm = 48 cm

23

(d) Required ratio = 1/2 : 1/3 : 1/4
To find the simple ratio, we will multiply
each of these by the LCM of 2, 3 and 4.
= 12 (1/2 : 1/3 : 1/4) = 6 : 4 : 3

24

(d)

No. of oxen	Work	Time
30	1/7	4
18	$\dfrac{6}{7}$	x

Applying the variation, we get

$30 \times 4 \times 7 = \dfrac{18 \times x \times 7}{6} \quad \Rightarrow x = 40$

25

(d) ₹ 2000

26

(b) Let B invested for n months

then $\dfrac{12000 \times 12}{16000 \times n} = \dfrac{3}{1} \Rightarrow n = 3$

27

(b) ₹ 1500

28

(c) Let their ages 5 years ago be 2x, 3x, 7x and 8x.
Their ages now $2x + 5, 3x + 5, 7x + 5, 8x + 5$.
Or, $20x + 20 = 140$

$\Rightarrow \quad 20x = 120 \Rightarrow x = 6$

Present age of Nishu $= 2 \times 6 + 5 = 17$ years
Present age of mother $= 7 \times 6 + 5 = 47$ years
Hence, required years $(47 - 17)$ years $= 30$ years

29

Then, $3x.1 + 4x.\dfrac{1}{2} + 12x.\dfrac{1}{4} = 600$

$3x + 2x + 3x = 600 \Rightarrow 8x = 600 \Rightarrow x = 75$
No. of 25 paise coins $= 12 \times 75 = 900$

30

(a) No. of cogs remains inversely proportional to the number of turns.

No. of turns $= \dfrac{80}{45} \times \dfrac{54}{32} \times 8 = 24$

31

(a) Sum invested by A, B and C is
$5 \times 12 : 7 \times 12 : 6 \times 6 + 3 \times 6$
$\Rightarrow 60 : 84 : 54 \Rightarrow 10 : 14 : 9$

$\therefore \quad$ Share of $C = \dfrac{9}{33} \times 33,000 = ₹9,000$

32

(c) Let the profit $= x$

Profit of $A = \dfrac{9x}{10}$, Remaining profit $= \dfrac{x}{10}$

Profit of $B = \dfrac{x}{20}$

Profit of $C = \dfrac{x}{20}$

Ratio of profit $= \dfrac{9}{10} : \dfrac{1}{20} : \dfrac{1}{20} = 18 : 1 : 1$

A's income is increased by ₹ 270 . When profit rises 3%

Investment of $A = \dfrac{270}{3} \times 100 = ₹ 9000.$

If investments of A, B and $C = 18x$, x and x
$18x = 9000 \Rightarrow x = 500$
B invested $= ₹ 500$ & C invested $= ₹ 500.$

33

(c) Suppose B joined after x months.
Then, $21000 \times 12 = 36000 \times (12 - x)$
$\Rightarrow 36x = 180 \Rightarrow x = 5.$
Hence, B joined after 5 months.

34

(b) Ratio of investments of Abhishek and Sudin
$= (50{,}000 \times 36) + (30{,}000 \times 24) : (70{,}000 \times 24)$
$= (18{,}00{,}000 + 7{,}20{,}000) : 16{,}80{,}000 = 3 : 2$
Hence, share of Sudin in the profit earned

from the business $= \dfrac{87{,}500}{(3+2)} \times 2 = ₹ 35{,}000.$

35

(b) $A : B : C = (5000 \times 4 + 2500 \times 8) : $
$(4500 \times 6 + 3000 \times 6) : (7000 \times 6)$
$= 40000 : 45000 : 42000 = 40 : 45 : 42$

$\therefore A\text{'s share} = ₹ \left(5080 \times \dfrac{40}{127} \right) = ₹ 1600;$

$B\text{'s share} = ₹ \left(5080 \times \dfrac{45}{127} \right) = ₹ 1800;$

$C\text{'s share} = ₹ \left(5080 \times \dfrac{42}{127} \right) = ₹ 1680.$

36

(b) $A : B : C = (40000 \times 36) : (80000 \times 12 + 40000 \times 24) : (120000 \times 24 + 40000 \times 12)$
$= 144 : 192 : 336 = 3 : 4 : 7$

37

(a) 3.5 hrs

38

(a) Let the prices of two houses A and B be ₹ $4x$ and ₹ $5x$, respectively for the last year.

Then, the prices of A this year = ₹ $(1.25 \times 4x)$ and that of B = ₹ $(5x + 50,000)$

This year, Ratio of their prices = 9 : 10

$$\therefore \quad \frac{1.25 \times 4x}{5x + 50,000} = \frac{9}{10} \Rightarrow x = 90,000$$

Hence, the price of A last year was $4x = ₹ 3,60,000$

39

(c) Gold in $C = \left(\frac{7}{9} + \frac{7}{18}\right)$ units $= \frac{7}{6}$ units.

Copper in $C = \left(\frac{2}{9} + \frac{11}{18}\right)$ units $= \frac{5}{6}$ units.

$\therefore$ Gold : Copper $= \frac{7}{6} : \frac{5}{6} = 7 : 5$.

40 **(b)** ₹ 8

41 **(d)** 18

42 **(a)** 31500

43 **(a)** ₹ 3600

44 **(a)** 324, 1134

45 **(a)** 27

46 **(d)** 50

47 **(c)** 200, 300, 400

48 **(c)** 10 months

49 **(d)** 7

50 **(c)** 25