ANSWERS AND EXPLANATIONS

EXERCISE 1

1. (a) Given, $\dfrac{3}{21}=\dfrac{x}{35} \Rightarrow x=\dfrac{3\times35}{21}=5$

2. (c) Let the numbers be $5x$ and $4x$.
   Now, difference of numbers = 10
   i.e. $5x - 4x = 10 \Rightarrow x = 10$
   $\therefore$ Larger number = $10 \times 5 = 50$

3. (d) Suppose the first number is x and the second number y.

   Therefore, 40% of $x = \dfrac{2}{3}$ of y

   $\therefore \quad \dfrac{x}{y} = \dfrac{2}{3} \times \dfrac{100}{40} = \dfrac{5}{3}$

4. (a) Let the salaries of A and B be 9x and 4x.

   $9x \times \dfrac{115}{100} = 5175$

   $\therefore \quad x = 500$
   $\therefore \quad$ salary of $B = 500 \times 4 = ₹2000$

5. (a) Reqd ratio $= 5\dfrac{140}{100} : 7\dfrac{150}{100} : 8\dfrac{175}{100}$

   $= 5 \times 140 : 7 \times 150 : 8 \times 175 = 2 : 3 : 4$

6. (d) Total number of students in the school = 819
   Number of girls = 364
   $\therefore$ Number of boys = 819 - 364 = 455
   $\therefore$ Required ratio = 435 : 364 = 5 : 4

7. (d) Share of Urmila in dividend

   $= \left(\dfrac{2}{6} \times 57834\right) = ₹\ 19278$

8. (c) Let the present ages of Sushama and Karishma be 6x and 7x respectively.

   $\therefore \quad \dfrac{6x+8}{7x+8} = \dfrac{8}{9}$

   or $56x + 64 = 54x + 72$

   $x = \dfrac{8}{2} = 4$

   Required ratio $= \dfrac{6 \times 4 + 12}{7 \times 4 + 12} = \dfrac{36}{40} = 9 : 10$

9. (e) Let the number of girls = x
   $\therefore$ Number of boys = 1.16 x

$\therefore$ Required ratio = 1.16 x : x
$= 116 : 100 = 29 : 25$

10. (d) According to the question,
    $\dfrac{A}{B} = \dfrac{4}{7}$ ... (i)

    and $\dfrac{A\left(1+\dfrac{50}{100}\right)}{B\left(1-\dfrac{25}{100}\right)} = \dfrac{8}{7}$ ... (ii)

    From equations (i) and (ii), we cannot find the earning of A and B.

11. (d) Ratio of the amounts received by A, B and C = 7 : 8 : 6
    $\therefore$ Sum of the ratios = 7 + 8 + 6 = 21
    Sum received by

    Pinku $= \dfrac{7}{21} \times 4200 = ₹\ 1400$

    Rinku $= \dfrac{8}{21} \times 4200 = ₹1600$

    Tinku $= \dfrac{6}{21} \times 4200 = ₹1200$

    According to the question,
    On adding ₹200 to the share of each one,
    the required ratio
    $= 1600 : 1800 : 1400$
    $= 8 : 9 : 7$

12. (c) Total number of students = 1495
    $\therefore$ Number of boys = 3250 - 1495 = 1755
    $\therefore$ Required ratio = 1755 : 1495 = 27 : 23

13. (e) Ratio of the capital of Rinku and Pooja

    $= \dfrac{5100}{6600} = \dfrac{51}{66} = \dfrac{17}{22}$

    $\therefore$ Rinku's share $= \dfrac{2730 \times 17}{17 + 22} = ₹\ 1190$

14. (b) Let the present ages of Richa and Shelly be 5x and 8x years.
    According to the question,
    After 10 years,

    $\dfrac{5x+10}{8x+10} = \dfrac{7}{10}$

    or, 56x + 70 = 50x + 100
    or, 56x − 50x = 100 − 70
    or, 6x = 30

$\therefore$ x = $\dfrac{30}{6}$ = 5

$\therefore$ Shelly's present age = 8x
= 8 × 5 = 40 years

15. (d) The sum of money is not known.

16. (a) Let the age of woman be 2x years and that of her daughter be x years.
According to the question,
2x + x = 2 × 42
or, 3x = 84

or, x = $\dfrac{84}{3}$ = 28

$\therefore$ Daughter's age = 28 years

17. (c) Let the number of girls be = x

$\therefore$ Number of the boys = $\dfrac{115x}{100}$

$\therefore$ Required ratio = $\dfrac{115x}{100}$. x = 23 : 20

18. (a) Let the present ages of Smita and Kavita be 3x and 8x years respectively
According to questions,

$\dfrac{3x+7}{8x+7} = \dfrac{4}{9}$

or, 32 x + 28 = 27x + 63
or, 32x − 27x = 63 − 28
or, 5x = 35

or, x = $\dfrac{35}{5}$ = 7

$\therefore$ Kavita's present age = 8x
= 8 × 7 = 56 years

19. (a) Let the ages of man and his son be 5x and 3x respectively.
$\because$ 5x + 3x = 2 × 48
$\Rightarrow$ 8x = 96

$\Rightarrow$ x = $\dfrac{96}{8}$ = 12

$\therefore$ Son's age = 12 × 3 = 36 years

20. (d) Difference in age

$= \dfrac{9\times(6-5)(9-8)}{6\times8-9\times5}$

$= \dfrac{9\times1\times1}{3}$ = 3 years

21. (e) Let Arun's present age be x years.
Then, Deepak's present age = (x + 14) years

Then, $\dfrac{x\ \ 7}{x\ \ 14\ \ 7}\ \ \dfrac{5}{7}$

7x   5x   35   49

x $\dfrac{84}{2}$ 42

$\therefore$ Deepak's present age
= 42 + 14 = 56 years

22. (d) Data is given in ratio. So age can't be determined.

23. (a) Let number of students in Arts and Commerce were 4x and 5x respectively.
Then,

$\dfrac{4x}{5x+65} = \dfrac{8}{11}$

$\Rightarrow$ 44x − 40x = 520

$\Rightarrow$ x = $\dfrac{520}{4}$ = 130

$\therefore$ Number of students in Arts
= 4 × 130
= 520

24. (d) Ratio of capital
= 50000 × 12 : 80000 × 6
= 5 : 4

$\therefore$ Sarita's share = $\dfrac{18000\times5}{(5+4)}$

= ₹ 10000

25. (c) Let the original number of boys and girls be 6x and 5x respectively.

Then, $\dfrac{6x\ \ 8}{5x\ \ 2}\ \ \dfrac{11}{7}$

55x   42x   56   22

x $\dfrac{78}{13}$ 6

$\therefore$ Number of boys
= 6 × 6 + 8 = 44

26. (a) Let the present ages of P and Q be 3x and 4x respectively.
Then,
(4x + 4) − (3x + 4) = 5
$\Rightarrow$ 4x − 3x = 5
$\Rightarrow$ x = 5
$\therefore$ P's present age
= 3 × 5 = 15 yrs.

27. (a) Present age of Meena

$= \dfrac{8\times8\times(10-3)}{24-10}$

$= \dfrac{8\times8\times7}{14}$ = 32 years

28. (b) Ratio of the salaries of Sumit and Rajan

$= \dfrac{2}{5} : \dfrac{1}{2} = 4 : 5$

Rajan's salary $= \dfrac{5}{9} \times 36000 = ₹20000$

29. (a) $\dfrac{?}{84} = \dfrac{189}{?}$

or $\quad ?^2 = 84 \times 189$

or $\quad ?^2 = 21 \times 4 \times 21 \times 9$

or $\quad ?^2 = 21^2 \times 2^2 \times 3^2$

∴ $? = 21 \times 2 \times 3 = 126$

30. (b) Let the present age of father and son be 17x and 7x respectively.

Then, $\dfrac{17x - 6}{7x - 6} = \dfrac{3}{1}$

$\Rightarrow 21x - 17x = 18 - 6$

$\Rightarrow x = 12 \div 4 = 3$

∴ Father's present age

$= 17 \times 3 = 51$ years.

31. (c) Required amount

$= \dfrac{2580}{(9-4)} \times (3+10)$

$= \dfrac{2580 \times 13}{5} = ₹\,6708$

32. (d) Smallest angle

$= (13+12) \times \dfrac{20}{100} = 5$

∴ Ratio of angles = 13 : 12 : 5

∴ Sum of smallest and second largest angles

$= \dfrac{180 \times (12+5)}{(13+12+5)}$

$= \dfrac{180 \times 17}{30} = 102°$

33. (a) Required number of gold coins

$= \dfrac{\{950 - (25+15+30)\} \times 73}{(20+73+83)} + 15$

$= 365 + 15$

$= 380$

34. (b) Let the present ages be 4x and 5x respectively.

Then, $\dfrac{4x+6}{5x+6} = \dfrac{6}{7}$

$\Rightarrow \quad 30x - 28x = 42 - 36$

$\Rightarrow \quad x = \dfrac{6}{2} = 3$

∴ Difference in age

$= 5x - 4x$

$= x = 3$ years

35. (b) Let the fourth proportional to 5, 8, 15 be x.

Then, 5 : 8 : : 15 : x $\Rightarrow 5x = (8 \times 15) \Rightarrow x = \dfrac{(8 \times 15)}{5} = 24.$

36. (b) $(x \times 5) = (0.75 \times 8) \Rightarrow x = \dfrac{6}{5} = 1.20.$

37. (d) Given the ratio $= \dfrac{1}{2} : \dfrac{2}{3} : \dfrac{3}{4} = 6 : 8 : 9.$

∴ 1st part $= ₹ \left(782 \times \dfrac{6}{23} \right) = ₹\,204.$

38. (d) Number of nurses $= \dfrac{7}{12} \times 240 = 140$

EXERCISE 2

1. (e) Suppose the salaries of A, B and C were 300k, 500k and 700k respectively.

After increment salary of

A = 300k + 50% of 300k = 450k

B = 500k + 60% of 500k = 800k

C = 700k + 50% of 700k = 1050k

Hence, new ratio of the respective salaries of A, B and C = 450k : 800k : 1050k = 9 : 16 : 21

2. (b) Let, weight of sugar costing ₹ 5.75 per kg = x kg

$x \times 5.75 + 75 \times 4.50 = 5.50 \times (x + 75)$

$\Rightarrow 5.75x + 337.50 = 5.50x + 412.50$

$\Rightarrow 0.25x = 75$

∴ x = 300 kg

3. (c) Ratio of the amount is

$\dfrac{P\left(1+\dfrac{r}{100}\right)^2}{\left(P+\dfrac{Pr}{100}\right)} = \dfrac{6}{5} \Rightarrow \left(1+\dfrac{r}{100}\right) = \dfrac{6}{5} \Rightarrow r = 20\%$

4. (d) All the given options are wrong.

Let the passengers in A.C. Sleeper Class, 1st Class and Sleeper Class be x, 2x and 3x respectively and the fares in these classes be 5y, 4y and 2y respectively.

Hence the incomes from these classes are 5xy, 8xy, 6xy respectively.

Required income $= \dfrac{5}{19}$ 54000 = ₹ 14210

5. (d) The number of police involved $\dfrac{3}{5}$ 135 81

Required number of supporters = 81 9 = 729

6. (b) Let actual distance be x km. Then,

$\dfrac{3}{4} : 1 :: 60 : x$

$\Rightarrow \dfrac{3}{4}x = 60 \Rightarrow x = \dfrac{240}{3} = 80$ km

7. (c) Number of girls $= \dfrac{5}{2+5} \times 350 = 250$

8. (b) 18 carat gold

$= \dfrac{3}{4}$ pure gold $= \dfrac{3}{4} \times 24 = 18$ carat gold

20 carat gold

$= \dfrac{5}{6}$ pure gold $= \dfrac{5}{6} \times 24 = 20$ carot gold

Required ratio = 18 : 20 = 9 : 10

9. (b) Let the no. of one rupee, 50 paise and 25 paise coins be 2x, 3x and 4x respectively.
According to question,

$2x + \dfrac{3x}{2} + \dfrac{4x}{4} = 216 \Rightarrow \dfrac{8x + 6x + 4x}{4} = 216$

$\therefore$ x = 48

$\therefore$ Number of 50 paise coins = 48 × 3 = 144

10. (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 $\dfrac{C}{A} = \dfrac{4x}{2x} = \dfrac{2}{1}$

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

11. (c) Let the shares of A, B, C and D be ₹ 5x, ₹ 2x, ₹ 4 x and ₹ 3x respectively.
Then, $4x - 3x = 1000 \Rightarrow x = 1000$
$\therefore$ B's Share = ₹ 2x = ₹ 2000

12. (c) Let A = 2k, B = 3k and C = 5k.

A's new salary $= \dfrac{115}{100}$ of $2k = \left(\dfrac{115}{100} \times 2k \right) = \dfrac{23}{10}k$

B's new salary $= \dfrac{110}{100}$ of $3k = \left(\dfrac{110}{100} \times 3k \right) = \dfrac{33}{10}k$

C's new salary $= \dfrac{120}{100}$ of $5k = \left(\dfrac{120}{100} \times 5k \right) = 6k$

$\therefore$ New ratio $= \dfrac{23k}{10} : \dfrac{33k}{10} : 6k = 23 : 33 : 60.$

13. (d) Let number of passengers = x, 2x, 7x
and Rate = 5y, 4y, 2y
Now, since income = Rate × Number of passengers
$\therefore$ Income of passengers = 5xy, 8xy, 14 xy
$\therefore$ Income in ratio = 5 : 8 : 14
$\therefore$ Income from A.C. sleeper class

$= \dfrac{5}{5+8+14} \times 54,000$

$= ₹ 10, 000$

14. (a) Let the ratio be x : (x + 40). Then,

$\dfrac{x}{(x+40)} = \dfrac{2}{7} \Rightarrow 7x = 2x + 80 \Rightarrow x = 16.$

$\therefore$ Required ratio = 16 : 56.

15. (c) Total age of 3 boys = (25 × 3) years = 75 years
Ratio of their ages = 3 : 5 : 7.

Age of the youngest boy $= \left(75 \times \dfrac{3}{15} \right)$ years = 15 years

16. (c) Let enlarged breadth be x inches. Then,

$\dfrac{5}{2} : 4 :: \dfrac{15}{8} : x$

$\Rightarrow \dfrac{5}{2}x = 4 \times \dfrac{15}{8} \Rightarrow x = 3$ inches

17. (c) Originally, let the number of boys and girls in the college be 7x and 8x respectively.
Their increased number is (120% of 7x) and (110% of 8x)

i.e. $\left(\dfrac{120}{100} \times 7x \right)$ and $\left(\dfrac{110}{100} \times 8x \right)$

i.e. $\dfrac{42x}{5}$ and $\dfrac{44x}{5}$

$\therefore$ Required ratio $= \dfrac{42x}{5} : \dfrac{44x}{5} = 21 : 22.$

18. (c) Quantity of milk = 45 $\dfrac{4}{5}$ = 36 litres

Quantity of water $= 45 \times \dfrac{1}{5}$ = 9 litres

Let x litres of water be added.

Then, $\dfrac{36}{9+x} = \dfrac{3}{2}$

$\Rightarrow$ 72 = 27 + 3x or 3x = 45
or x = 15 litres

19. (e) Let number be divided in ratio x : y. Then

First part $\dfrac{x}{x \ y}$, second part $\dfrac{y}{x \ y}$

Now, $\dfrac{1}{4}$ $\dfrac{x}{x\ y}$ $\dfrac{1}{3}$ $\dfrac{y}{x\ y}$ $\dfrac{1}{2}$

20. (c) For 9 kg zinc, mixture melted = (9 + 11) kg.

For 28.8 kg zinc, mixture melted

$$= \left(\dfrac{20}{9} \times 28.8\right) kg = 64\, kg.$$

21. (b) Let there be x men at the beginning.

Less men, More days (Indirect Proportion)

Men : x : x – 6

Days : 15 : 9

$$\therefore 15:9::x:(x-6) \Rightarrow 15(x-6) = 9x$$

$$\Rightarrow 6x = 90 \Rightarrow x = 15. \quad `$$

22. (b) Let A's share = ₹ 2x, B's share = ₹ 3x and C's share = ₹ 7x

Now, 7x (2x 3x) 1500 x 750

$\therefore$ A's share = ₹ 2x = ₹ 1500

23. (a) $\dfrac{V}{C} = \dfrac{2}{3}$ and $\dfrac{V+4}{C} = \dfrac{3}{4}$ ...(1)

$$\therefore \quad C = \dfrac{3V}{2} \Rightarrow \dfrac{V+4}{3V/2} = \dfrac{3}{4} \qquad [\text{From (1)}]$$

where V denoted for vanilla and C for chocolate.

$$\Rightarrow \quad 4V + 16 = \dfrac{9V}{2} \Rightarrow 8V + 32 = 9V \Rightarrow V = 32$$

24. (d) Let the required price be ₹ x.

Then, Less toys, Less cost (Direct Proportion).

$\therefore 6 : 5 :: 264.37 : x \Rightarrow 6x = (5 \times 264.37)$

$$\Rightarrow x = \dfrac{(5 \times 264.37)}{6} \Rightarrow x = 220.308.$$

$\therefore$ Approximate price of 5 toys = ₹ 220.

25. (a) Let the required men be x.

More hours, less men (Indirect proportion)

More days, less men (Indirect proportion)

Hours 5 : 8 $\left.\right\}$ :: x : 18
Days 8 : 6

$\therefore \quad 5 \times 8 \times 18 = 8 \times 6 \times x$

$$\Rightarrow x = \dfrac{5 \times 8 \times 18}{8 \times 6} = 15$$

26. (d) Let the required number of mats be x.

More weavers, More mats

(Direct Proportion)

More days, More mats

(Direct Proportion)

Weavers 4:8 $\left.\right\}$ :: 4 : x
Days 4:8

$$\therefore 4 \times 4 \times x = 8 \times 8 \times 4 \Rightarrow x = \dfrac{8 \times 8 \times 4}{4 \times 4} = 16.$$

27. (a) Let the required days be x.

More men, less days (Indirect proportion)

More size, more days (Direct Proportion)

Men 20   12 $\left.\right\}$ :: 25 : x
size 100×3×0.5   60×4×0.25

$\therefore 20 \times 100 \times 3 \times 0.5 \times x$

$= 12 \times 60 \times 4 \times 0.25 \times 25$

$\Rightarrow x = 6$ days

28. (c) Let the required number of days be x.

Less cows, More days (Indirect Proportion)

Less bags, Less days (Direct Proportion)

Cows 1:40 $\left.\right\}$ :: 40 : x
Bags 40:1

$\therefore 1 \times 40 \times x = 40 \times 1 \times 40 \Rightarrow x = 40.$

29. (b) There is a meal for 200 children. 150 children have taken the meal.

Remaining meal is to be catered to 50 children.

Now, 200 children ≡ 120 men

$$\therefore \ 50 \text{ children} \equiv \left(\dfrac{120}{200} \times 50\right) \text{men} = 30 \text{ men}.$$

30. (b) Let the required number of days be x.

Less persons, More days

(Indirect Proportion)

More working hrs per day, Less days

(Indirect Proportion)

Persons 30:39 $\left.\right\}$ :: 12 : x
Working hrs / day 6:5

$$\therefore 30 \times 6 \times x = 39 \times 5 \times 12 \Rightarrow x = \dfrac{39 \times 5 \times 12}{30 \times 6} \Rightarrow x = 13.$$

31. (b) Initially, let there be x men having food for y days.

After 15 days, x men had food for (y – 15) days.

Also, $\left(x - \dfrac{x}{4}\right)$ men had food for y days.

$$\therefore \ \dfrac{3x}{4} : x :: (y-15) : y$$

$$\Rightarrow \dfrac{3x}{4} \times y = x(y-15)$$

$$\Rightarrow 3y = 4y - 60 \Rightarrow y = 60 \text{ days}$$

32. **(c)** In 2 days, 5 men set tiles = $180 \times 2 \times 5 = 1800$ tiles

∴ Area of floor

= Number of tiles × Area of each tile

$= 1800 \times 2 \times \dfrac{3}{4}$

$= 2700$ ft^2

33. **(a)** 3000 men taking 900 gms per head have provision for

$25 - 11 = 14$ days.

Less ratio per head, more men

(Indirect Proportion)

Less days, more men (Indirect Proportion)

$\left.\begin{array}{l}\text{Ratio} \ \ 840 : 900 \\ \text{Days} \ \ 10 : 14\end{array}\right\} :: 3000 : x$

∴ $840 \times 10 \times x = 900 \times 14 \times 3000$

⇒ x = 4500

∴ strength of reinforcement = 4500 − 3000 = 1500 men

34. **(b)** Let the required number of days be x.

$8 \text{ men} \equiv 17 \text{ boys} \Rightarrow 4 \text{ men} \equiv \dfrac{17}{2} \text{boys}$

∴ 4 men and 24 boys $\equiv \left(\dfrac{17}{2} + 24\right) \text{boys} = \dfrac{65}{2} \text{boys}$

Now, More boys, less days

(Indirect Proportion)

∴ $\dfrac{65}{2} : 17 :: 26 : x$

⇒ $\dfrac{65}{2} \times x = 17 \times 26$

⇒ $x = \dfrac{17 \times 26 \times 2}{65}$ days

But work ⟶ 50 × 0.9 times

∴ Required days

$= 50 \times 0.9 \times \dfrac{17 \times 26 \times 2}{65} = 612$ days

35. **(b)** Let the required number of hours be x.

Speeds of working of first and second type of

men are $\dfrac{1}{2}$ and $\dfrac{1}{3}$.

More work, More time (Direct Proportion)

Less speed, More time (Indirect Proportion)

$\left.\begin{array}{ll}\text{Work} & 1 : 2 \\ \text{Speed} & \dfrac{1}{3} : \dfrac{1}{2}\end{array}\right\} :: 25 : x$

∴ $\left(1 \times \dfrac{1}{3} \times x\right) = \left(2 \times \dfrac{1}{2} \times 25\right) \Rightarrow x = 75.$

EXERCISE 3

1. **(d)** Let, the number of passengers travelling by I and II class be x and 50x

and, fares of I and II class be 3y and y.

∴ Revenue is x × 3y + 50x × y = ₹ 1325

53xy = 1325

⇒ xy = 25

∴ Amount collected from the II class passengers

= 50xy = 50 × 25 = ₹ 1250.

2. **(b)** Weight of dry grapes without water

$= 250 \times \dfrac{90}{100} = 225$ kg

Let weight of fresh grapes be x kg.
According to question,

$x \times \dfrac{20}{100} = 225 \Rightarrow x = \dfrac{225 \times 100}{20} = 1125$ kg

3. **(c)** Let the questions with right answer be x.
Questions with wrong answer = 90 − x
Marks obtained = 387
5x − 2(90 − x) = 387
⇒ 5x − 180 + 2x = 387
⇒ 7x = 387 + 180 = 567 ⇒ x = 81
∴ Questions with wrong answers = 90 − 81 = 9

4. **(d)** Fare after reduction.

1st	*2nd*	*3rd*
$8 - \dfrac{8}{6}$	$6 - \dfrac{6}{12}$	3
⇒ $\dfrac{20}{3}$	$\dfrac{11}{2}$	3
⇒ 40	33	18

Ratio of revenue

1st	*2nd*	*3rd*

9×40 12×33 26×18

Ratio of revenue of all three classes = 10 : 11 : 13

$\therefore$ Collection for 1st class $= \dfrac{1088 \times 10}{34} = $ Rs 320

5.   (b)   A : B = 2 : 3 = 2 × 5 : 3 × 5 = 10 : 15

and B : C = 5 : 8 = 5 × 3 : 8 × 3 = 15 : 24

Therefore, A : B : C = 10 : 15 : 24

Let the numbers be 10x, 15x and 24x.

Then, 10x + 15x + 24x = 98

or 49x = 98 or x = 2

$\Rightarrow$ Second number = 15x = 15 × 2 = 30

6.   (c)   Let number of ladies = x

and, number of gents = 2x

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

$\Rightarrow x = 4$

$\therefore$ Total number of people originally present

$= 4 + 8 = 12$

7.   (b)   Let Son's share = ₹ S;

Daughter's share = ₹ D;

and Wife's share = ₹ W.

Also, S : W = W : D = 3 : 1

$\therefore$ S : W : D = 9 : 3 : 1

then S = 9x , D = x

and 9x – x = 10,000 $\Rightarrow$ x = ₹ 1250

$\therefore$ Total worth of the property

= (9 + 3 + 1) x = 13x

= 13 × 1250 = ₹ 16,250

8.   (a)   Let number of each type of coin = x. Then,

$1 \times x + .50 \times x + .25\, x = 35$

$\Rightarrow 1.75x = 35 \Rightarrow x = 20$ coins

9.   (b)   Let S denotes the shirts and T denotes the ties.

We have, 43S + 21T = 535

By hit and trial, S = 10, T = 5

$\Rightarrow 43 \times 10 + 21 \times 5 = 535$

$\therefore$ Ratio of shirts to ties = 10 : 5 = 2 : 1

10.   (a)   Let A's share be ₹ x,

B's share be ₹ y. Then,

C's share = ₹ [671 – (x + y)]

Now, $x + 3 : y + 7 : 671 - (x + y) + 9 = 1 : 2 : 3$

$\Rightarrow x + 3 : y + 7 : 680 - (x + y) = 1 : 2 : 3$

$\therefore x + 3 = \dfrac{1}{6} \times 690 = 115$

$\Rightarrow x = $ ₹ 112

Also $y + 7 = \dfrac{2}{6} \times 690 = 230$

$\Rightarrow y = $ Rs 223

$\therefore$ C's share $= $ Rs$[671 - (112 + 223)] = $ Rs 336

11.   (d)   Let the income of two persons be ₹ 4x and ₹ 5x

and their expenses be ₹ 7y and ₹ 9y.

Therefore, 4x – 7y = 50   ... (i)

and   5x – 9y = 50   ... (ii)

From (i) and (ii), we get

x = 100 and y = 50

The income of the two persons are

₹ 400 and ₹ 500, respectively.

12.   (b)   Let income of A = ₹ 3x, income of B = ₹ 2x

and expenditure of A = ₹ 5y,

expenditure of B = ₹ 3y

Now, saving = income – expenditure

$\therefore 3x - 5y = 2x - 3y = 200$

$\Rightarrow x = 2y$ and y = 200

$\therefore x = 400$

$\therefore$ A's income = ₹ 1200

13.   (b)   Let A's share $= $ Rs$\dfrac{15}{4} x$, B's share = ₹ 4x and

C's share = ₹ 5.5x

Given $\dfrac{15}{4} x$ 30   x   8

$\therefore$ Total amount = 30 + 32 + 44 = ₹ 106

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

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

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

15.   (c)   Let the three containers contain 3x, 4x and 5x litres of mixtures, respectively.

Milk in 1st mix. $= \left(3x \times \dfrac{4}{5} \right)$ litres $= \dfrac{12x}{5}$ litres.

Water in 1st mix. $= \left(3x - \dfrac{12x}{5} \right)$ litres $= \dfrac{3x}{5}$ litres.

Milk in 2nd mix. $= \left(4x \times \dfrac{3}{4} \right)$ litres $= 3x$ litres.

Water in 2nd mix. = (4x – 3x) litres = x litres.

Milk in 3rd mix. $= \left(5x \times \dfrac{5}{7} \right)$ litres $= \dfrac{25x}{7}$ litres.

Water in 3rd mix. $= \left(5x - \dfrac{25x}{7} \right)$ litres $= \dfrac{10x}{7}$ litres.

Total milk in final mix.

$= \left(\dfrac{12x}{5} + 3x + \dfrac{25x}{7} \right)$ litres $= \dfrac{314x}{35}$ litres.

Total water in final mix.

$= \left(\dfrac{3x}{5} + x + \dfrac{10x}{7} \right)$ litres $= \dfrac{106x}{35}$ litres.

Required ratio of milk and water

$= \dfrac{314x}{35} : \dfrac{106x}{35} = 157 : 53.$

16. (b) Let the fixed amount be ₹ x and the cost of each unit be ₹ y. Then,

540y + x = 1800   ... (i)

and 620 y+ x = 2040   ... (ii)

On subtracting (i) from (ii), we get 80y = 240 $\Rightarrow$ y = 3.

Putting y = 3 in (i), we get :

x = (1800 – 1620) = 180.

∴ Fixed charges = ₹ 180, Charge per unit = ₹ 3.

Total charges for consuming 500 units

= ₹ (180 + 500 × 3) = ₹ 1680.

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

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

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

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

18. (c) Since, A : B = 2 : 3 and B : C = 6 : 5

∴ A : B : C = 4 : 6 : 5

Then, A's share $= \dfrac{4}{4+6+5} \times 750 = Rs\,200$

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

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

20. (a) Let the number of male and female participants be 3x and x respectively.

Therefore total no. of participants are 4x.

During the tea break, the number of male participants are

$(4x - 16) \times \dfrac{3}{4} = 3x - 12$ .... (i)

and the number of female participants are

$(4x - 16) \times \dfrac{1}{4} + 6 = x + 2$ .... (ii)

Now, $\dfrac{3x - 12}{x + 2} = \dfrac{2}{1}$

$\Rightarrow 3x - 12 = 2x + 4 \Rightarrow x = 16.$

Therefore, the total number of participants are

= 4 × 16 = 64.

21. (b) Number of males $= \dfrac{2}{5} \times 25 = 10$

Number of females $= \dfrac{3}{5} \times 25 = 15$

Amount distributed among males and females

= 275 × 80% = ₹ 220

Let the wage paid to a male be ₹ 5x and that to a female be ₹ 4x. Therefore,

10 × 5x + 15 × 4x = 220

$\Rightarrow 50x + 60x = 220 \Rightarrow x = 2$

Wage received by a feamale labourer

= 2 × 4 = ₹ 8

22. (c) Let x pairs of brown socks were ordered.

Let P be the price of a brown pair.

Therefore, price of the black pair of sock = 2P

Now, 4P + 2Px = 1.5 (Px + 8P)

$\Rightarrow 4P + 2Px = \dfrac{3}{2}(Px + 8P)$

$\Rightarrow 8P + 4Px = 3Px + 24P$

$\Rightarrow Px = 16P \Rightarrow x = 16$

∴ Required ratio $= \dfrac{4}{16} = 1 : 4$

23. (b) Let the required length be x metres.

More breadth, Less length   (Indirect Proportion)

More depth, Less length

(Indirect Proportion)

More days, More length

(Direct Proportion)

Breadth   20:50

Depth   15:10 } :: 100 : x

Days   10:30

∴ $20 \times 15 \times 10 \times x = 50 \times 10 \times 30 \times 100$

$\Rightarrow x = \dfrac{50 \times 10 \times 30 \times 100}{20 \times 15 \times 10} \Rightarrow x = 500.$

24. (a) (100 × 35+ 200 × 5) men can finish the work in 1 day.

i.e., 4500 men can finish the work in 1 day

∴ 100 men can finish the work in 45 days

∴ The work would be 5 days behind the schedule.

25. (d) Remaining work $= 1 - \dfrac{2}{5} = \dfrac{3}{5}$

Remaining time = 56 – 30 = 26 days

More work, more men   (Direct Proportion)

Less days, more men   (Indirect Proportion)

More hours, Less men   (Indirect Proportion)

Work $\dfrac{2}{5} : \dfrac{3}{5}$

Days $26 : 30$ $\left.\right\}$ $:: 104 : x$

Hrs $\quad 9 : 8$

$\therefore \dfrac{2}{5} \times 26 \times 9 \times x = \dfrac{3}{5} \times 30 \times 8 \times 104$

$\Rightarrow x = 160$

$\therefore$ Additional men to be employed
$= 160 - 104 = 56$ men

26. (c) After 5 days : 250 students had provision for 30 days.
Now, let 275 students had provision for x days.
Then, more persons, less days
(Indirect Proportion)
$\therefore \; 275 : 250 :: 30 : x$

$\Rightarrow 275 \times x = 250 \times 30 \Rightarrow x = \dfrac{300}{11}$ days

Again, after 10 days : 275 students had provision

for $\left(\dfrac{300}{11} - 10\right) = \dfrac{190}{11}$ days.

Let $(275 - 25) = 250$ students had provision
for y days
Less persons, more days
(Indirect Proportion)

$\therefore 250 : 275 :: \dfrac{190}{11} : y$

$\Rightarrow 250 \times y = 275 \times \dfrac{190}{11} \Rightarrow y = 19$ days

27. (b) More machines, less hours (Indirect Proportion)
Less days, more hours (Indirect Proportion)
More amount of coal, more hours
(Direct Proportion)
Less efficiency, more hours
(Indirect Proportion)

Machine $\qquad 3 : 2$

Days $\qquad 6 : 8$ $\left.\right\}$ $:: 12 : x$

Amount of coal $9,000 : 12,000$

$\therefore$ Efficiency $\quad 0.8 : 0.9$

$\Rightarrow \; 3 \times 6 \times 9,000 \times 0.8 \times x$
$\quad = 2 \times 8 \times 12,000 \times 0.9 \times 12$

$\Rightarrow x = 16$ hrs

28. (a) Let 4 men left the work after x days.

Then, after x days,

10 men should completed work in (40 –x) days

but, 6 men completed work in (50 – x) days.

$\therefore 10 : 6 :: (50 - x) : (40 - x)$

$\Rightarrow 6 (50 - x) = 10 (40 - x)$

$\Rightarrow 4x = 400 - 300 \Rightarrow x = \dfrac{100}{4} = 25$ days

Alternate :

Since, 10 men completed the work in 40 days.

$\therefore$ 1 man completed the work in 400 days.

$\therefore$ Work of One day of a man $= \dfrac{1}{400}$ th part.

Suppose 4 men left the work after x days.

Then, work done by 10 men in x days + work done by

6 men in (50 – x) days = 1

$\Rightarrow \dfrac{1}{400} \times 10 \times x + \dfrac{1}{400} \times 6 \times (50 - x) = 1$

$\Rightarrow 10x + 300 - 6x = 400$

$\Rightarrow 4x = 100 \Rightarrow x = 25$ days

29. (b) Let M denotes man and B denotes boy.

(M + B)'s 1 day's work $= \dfrac{1}{40}$

i.e. $\dfrac{1}{M} \; \dfrac{1}{B} \; \dfrac{1}{40}$

Ratio of their skill $= \dfrac{8}{5}$ i.e. $\dfrac{1}{M} \Big/ \dfrac{1}{B} \; \dfrac{8}{5}$

Let efficiency of a man of 1 days work = x

i.e. $\dfrac{1}{M} \; x$

Now, $\dfrac{1}{M} \; \dfrac{8}{5} \; \dfrac{1}{B} \; \dfrac{1}{B} \; \dfrac{5x}{8}$

Now, $\dfrac{13x}{8} \; \dfrac{1}{5} \quad x \quad \dfrac{1}{65} \; \Rightarrow \; M = 65$ and

$\dfrac{1}{B} \; \dfrac{1}{104}$