EXERCISE

1. 465 coins consists of 1 rupee, 50 paise and 25 paise coin. Their values are in the ratio 5:3:1. The number of each type of coins respectively is
(a) 155, 186, 124 (b) 154, 187, 124
(c) 154, 185, 126 (d) 150, 140, 175

2. 110. If x:y::2:3 and 2:x::4:8 the value of y is
(a) 6 (b) 8
(c) 4 (d) 12

3. If `782 be divided into three part, proportional to $\frac{1}{2}:\frac{2}{3}:\frac{3}{4}$, then the first part is:
(a) `182 (b) `190
(c) `196 (d) `204

4. The dimensions of a rectangular room when increased by 4 meters are in the ratio of 4:3 and when decreased by 4 metres, are in the ratio of 2:1. The dimensions of the room are
(a) 6 m and 4 m (b) 12 m and 8 m
(c) 16 m and 12 m (d) 24 m and 16 m

5. What is the least integer which when added to both terms of the ratio 5:9 will make a ratio greater than 7:10?
(a) 6 (b) 8
(c) 5 (d) 7

6. Two numbers are such as that square of one is 224 less than 8 times the square of the other. If the numbers are in the ratio of 3:4, they are
(a) 12, 16 (b) 6, 8
(c) 9, 12 (d) None of these

7. Given that 24 carat gold is pure gold, 18 carat gold is $\frac{3}{4}$ gold and 20 carat gold is $\frac{5}{6}$gold, the ratio of the pure gold in 18 carat gold to the pure gold in 20 carat gold is:
(a) 3:8 (b) 9:10
(c) 15:24 d) 8:5

8. A bag contains `216 in the form of one rupee, 50paise and 25 paise coins in the ratio of 2:3:4. The number of 50 paise coin is:
(a) 96 (b) 144
(c) 114 (d) 141

9. If A:B:C=2:3:4, then $\frac{A}{B}:\frac{B}{C}:\frac{C}{A}$ is equal to:
(a) 4:9:16 (b) 8:9:12
(c) 8:9:16 (d) 8:9:24

10. Tea worth `126 per kg and `135 per kg are mixed with a third variety in the ratio 1:1:2. If the mixture is worth `153 per kg, then the price of third variety per kg is
(a) `169.50 (b) `170
(c) `175.50 (d) `180

11. The sum of three numbers is 98. If the ratio of the first to the second is 2:3 and that of the second to the third is 5:8, then the second number is:
(a) 20 (b) 30
(c) 38 (d) 48

12. The ratio of number of ladies to gents at a party was 1:2 but when 2 ladies and 2 gents left, the ratio became1:3. How many people were originally present at the party?
(a) 6 (b) 9
(c) 12 (d) None of these

13. A man divides his property so that his son's share to his wife's and the wife's share to his daughter are both in the ratio 3:1. If the daughter gets `10,000 less than the son, find the total worth of the property.
(a) `16,200 (b) `16,250
(c) `16,500 (d) None of these

14. 14. A, B and C are partners. A receives 9/10 of the profit and B and C share the remaining profit equally. A's income is increased by `270 when the profit rises from 12 to 15%. Find the capital invested by B and C each
(a) `5000 (b) `1000
(c) `500 (d) `1500

15. The salaries of A, B, C are in 2:3:5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be the new ratio of their salaries?
(a) 3:3:10 (b) 10:11:20
(c) 23:33:60 (d) cannot be determined

16. In an express train, the passengers travelling in A.C. sleeper class, First class and Sleeper class are in the ratio 1:2:7, and rate for each class is in the ratio 5:4:2. If the total income from this train is `54,000, find the income of Indian Railways from A, C, sleeper class.
(a) `12,000 (b) `20,000
(c) `22,000 (d) `10,000

17. A, B and C started a business. A invests $\frac{1}{2}$ capital for $\frac{1}{4}$ time, B invests $\frac{1}{8}$ capital for $\frac{1}{2}$ time and C invests the remaining capital for whole time. Find the share of B in the total profit of `9900.
(a) `2200 (b) `1100
(c) `6600 (d) `4400

18. If a:b:=c:d then the value of $\frac{a^2+b^2}{c^2+d^2}$ is
(a) ½ (b) $\frac{a+b}{c+d}$
(c) $\frac{a-b}{c-d}$ (d) $\frac{ab}{cd}$

19. A photograph measuring $2\frac{1''}{2} \times 1\frac{7''}{8}$ is to be enlarged so that the length will be 4". How many inches will the enlarged breadth be?
(a) $1\frac{1}{2}$ (b) $2\frac{1}{8}$
(c) 3 (d) $3\frac{3}{8}$

20. The ratio of the number of boys and girls in a college is 7:8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?
(a) 8:9 (b) 17:18
(c) 21:22 (d) cannot be determined

21. In a mixture of 45 litres, the ratio of milk and water is 4:1.How much water must be added to make the mixture ratio 3:2?
(a) 72 litres (b) 24 litres
(c) 15 litres (d) 1.5 litres

22. If a:b=2:3,b:c=3:4,c:d=4:5, find a:b:c:d.
(a) 5:4:3:2 (b) 30:20:15:12
(c) 2:3:4:6 (d) 2:3:4:5

23. In what proportion must a number be divided so that $\frac{1}{4}$ of the first part and $\frac{1}{3}$ of the second part are together equal to $\frac{1}{2}$ of the original number?
(a) 1:2 (b) 5:4
(c) 2:3 (d) 4:5

24. Divide □ 671 among A, B, C such that if their shares be increased by ` 3, `7 and `9 respectively, the remainder shall be in the ratio 1:2:3.
(a) ` 112, ` 223, ` 336
(b) ` 114, ` 221, `336
(c) `112, ` 227, ` 332
(d) ` 114, ` 223, ` 334

25. If ` 1066 is divided among A, B, C and D such that A:B = 3:4, B:C = 5:6 and C:D = 7:5,who will get the maximum?
(a) B (b) A
(c) C (d) D

26. Zinc and copper are melted together in the ratio 9:11. What is the weight of melted mixture, if 28.8 kg of zinc has been consumed in it?
(a) 58kg (b) 60kg
(c) 64kg (d) 70kg

27. If a/b=1/3, b/c=2, c/d=1/2, d/e=3 and e/f=1/4, then what is the value of abc/def?
(a) 3/8 (b) 27/8
(c) 3/4 (d) 27/4

28. The income of A and B are in the ratio 3:2 and expenses are in the ratio 5:3. If both save `200, what is the incomeof A?
(a) ` 1000 (b) ` 1200
(c) ` 1500 (d) ` 1800

29. A Sum of money is divided among A, B and C in the ratio of $3\frac{3}{4}: 4: 5.5$. If the lowest share is `30, then the total amount of money is

(a) ` 212 (b) ` 106

(c) ` 53 (d) ` 159

30. A and B are two alloys of gold and copper prepared by mixing metals in the ratio 7:2 and 7:11 respectively. If equal quantities of the alloys are melted to form a third alloy C, the ratio of gold and copper in C Will be:

(a) 5:7 (b) 5:9

(c) 7:5 (d) 9:5

31. Three containers have their volumes in the ratio 3:4:5. They are full of mixtures of milk and water in the ratio of (4:1), (3:1) and (5:2) respectively.The contents of all these three containers are poured into a fourth container.The ratio of milk and water in the fourth container is:

(a) 4:1 (b) 151:48

(c) 157:53 (d) 5:2

32. Two casks of 48 L and 42 L are filled with mixtures of wine and water, the proportions in the two casks being respectively 13:7 and 18:7. If the contents of the two casks be mixed and 20 L of water is added to the whole, what will be the proportions of wine to water in the resultant solution?

(a) 21:31 (b) 12:13

(c) 13:12 (d) None of these

33. A sum of money is to be divided among A.B and C in the ratio 2:3:7. If the total share of A and B together is `1,500 less than C, What is A's share in it?

(a) `1,000 (b) `1,500

(c) `2,000 (d) ` Data insufficient

34. The Binary Ice-cream Shopper sells two flavors: Vanilla and Chocolate. On Friday, the ratio of Vanilla cones sold to Chocolate cones sold was 2:3. If the store had sold 4 more vanilla cones, then, the ratio of Vanilla cones sold to the Chocolate cones sold would have been 3:4. How many Vanilla cones did the store sell on Friday?

(a) 32 (b) 35

(c) 42 (d) 48

35. If $\frac{y}{x-z} = \frac{y+x}{z} = \frac{x}{y}$, then find x : y : z.

(a) 1 : 2 : 3 (b) 3 : 2 : 1

(c) 4 : 2 : 3 (d) 2 : 4 : 7

36. At a start of a seminar, the ratio of the number of male participants to the number of female participants to the number of female participants was 3:1. During the tea break 16 participants registered. The ratio of the male to the female participants now became 2:1. What was the total number of participants at the start of the seminar?

(a) 64 (b) 48

(c) 54 (d) 72

37. A contractor employed 25 laborers on a job. He was paid ` 275 for the work. After retaining 20% of this sum, he distributed the remaining amount amongst the labourers. If the number of male to female laborers was in the ratio 2:3 and their wages in the ratio 5:4, what wages did a female labourer get?

(a) ` 15 (b) ` 8

(c) ` 14 (d) ` 10

38. A man ordered 4 pairs of black socks and some pairs of brown socks. The price of a black pair is double that of a brown pair. While preparing the bill, the clerk interchanged the number of black and brown pairs by mistake which increased the bill by 50%. The ratio of the number of black and brown pairs of sock in the original order was:

(a) 4 : 1 (b) 2 : 1

(c) 1 : 4 (d) 1 : 2

39. A certain number of persons can dig a trench 100 m long, 50 m broad and 10 m deep in 10 days. The same number of persons can dig another trench 20 m broad and 15 m deep in 30 days. The length of the second trench is:

(a) 400 m (b) 500 m

(c) 800 m (d) 900 m

40. In a dairy farm, 40 cows eat 40 bags of husk in 40 days. In how many days one cow will eat one bag of husk?
(a) 1 (b) $\frac{1}{40}$
(c) 40 (d) 80

41. The resistance of a wire is proportional to its length and inversely proportional to the square of its radius. Two wires of the same material have the same resistance and their radii are in the ratio 9:8. If the length of the first wire is 162 cms., find the length of the other.
(a) 64 cm. (b) 120 cm.
(c) 128 cm. (d) 132 cm.

42. The prize money of ` 1,800 is divided among 3 students A, B and C in such a way that 4 times the share of A is equal to 6 times the share of B, which is equal to 3 times the share of C. The A's share is
(a) `400 (b) `600
(c) `700 (d) `800

43. Divide 81 into three parts so that $\frac{1}{2}$ of 1st, $\frac{1}{3}$ of 2nd and $\frac{1}{4}$ of 3rd are equal.
(a) 36, 27, 18 (b) 27, 18, 36
(c) 18, 27, 36 (d) 30, 27, 24

44. A, B and C entered into partnership, and provided capitals of `22,000, `26,000 and `34,000 respectively. Some months later `10,000 extra capital being needed, it was supplied by B. At the end of 12 months the total profit was `50,274, and A's share was `12,747. When did B supply the extra capital?
(a) After 6 months (b) After 5 months
(c) After 4months (d) After 8 months

45. A started a business with a certain amount of money. After a few months B became his partner, contributing three times what A had contributed. At the end of the year, each was entitled to half the total profit. When did B join as a partner?
(a) 10 months after A (b) 6 months after A
(c) 1 months after (d) 8 months after A

46. A and B enter into a partnership. A puts in `2000 but at the end of 3 months, withdraws `500 and again at the end of 8 months withdraws `300. Out of a total profit of `900 at the end of the year, B's share was `400. Find B's capital.
(a) `1000 (b) `1220
(c) `1340 (d) `1500

47. A and B continued in a joint business for 36 months. A contributes `300 for a certain time and B invests `500 for the remaining period. If out of a total profit of `1,020 A gets `495 for how long did B keep his money.
(a) 1 year (b) 14 months
(c) 15 months (d) 18 months

48. A, B and C start a business by investing `2000, 3000 and `4000 respectively. But B increases his investment to `4000 after 4 months and C withdraws `1000 at the end of 9 months. What is A's share out of a total profit of `8475 earned in a year?
(a) `1800 (b) `1600
(c) `1500 (d) `1700

49. A, B and C center into a partnership with their capitals in the $\frac{7}{2}:\frac{4}{3}:\frac{6}{5}$. After 4 months, A increases his share 50%. If the total profit at the end of the year was `2,16,000, then B's share in the profit was
(a) `22,000 (b) `24,000
(c) `30,000 (d) `40,000

ANSWER KEYS			
1	(a)	26	(c)
2	(a)	27	(a)
3	(d)	28	(b)
4	(b)	29	(b)
5	(c)	30	(c)
6	(b)	31	(c)
7	(b)	32	(b)
8	(b)	33	(b)
9	(d)	34	(a)
10	(c)	35	(c)
11	(b)	36	(a)
12	(c)	37	(b)
13	(b)	38	(c)
14	(c)	39	(b)
15	(c)	40	(c)
16	(d)	41	(c)
17	(b)	42	(b)
18	(d)	43	(c)
19	(c)	44	(c)
20	(c)	45	(b)
21	(c)	46	(b)
22	(d)	47	(b)
23	(a)	48	(a)
24	(a)	49	(d)
25	(c)		

HINTS & EXPLANATIONS

1. (a) The ratio of number of coins = 5:6:4

∴The number of one rupee coins = $\frac{465}{5+6+4} \times 5 = 155$

The number of 50 paise coins = $\frac{465}{5+6+4} \times 6 = 186$

The number of 25 paise coins = $\frac{465}{5+6+4} \times 4 = 124$

2. (a) $\frac{x}{y} = \frac{2}{3}; \frac{2}{x} = \frac{4}{8}$

$$y = \frac{3}{2}x = \frac{3}{2} \times 4 = 6$$

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

∴ 1st part ⍰ $\left(782 \times \frac{6}{23}\right)$=`204.

4. (b) Let the length and breadth of the rectangular room be l and b.

We have, $\frac{l+4}{b+4} = \frac{4}{3}$

$$\Rightarrow 3l + 12 = 4b + 16$$

$\Rightarrow 3l - 4b = 4$ … (1)

Again, we have $\frac{l-4}{b-4} = \frac{2}{1} \Rightarrow l - 4 = 2b - 8$

$\Rightarrow l - 2b = -4$ … (2)

Solving (1) and (2), we get l = 12 and b = 8.

5. (c) If x is the integer, $\frac{5+x}{9+x} > \frac{7}{10}$

$$\therefore 50 + 10x > 63 + 7x$$

$$\therefore 3x > 13$$

$$\therefore x > \frac{13}{3}$$

The least integer greater than $\frac{13}{3}$ is 5.

6. (b) Given, ratio of numbers is 3:4

∴The numbers are 3x and 4x.

Now, according to the question

$$16\,x^2 = 8(3x)^2 - 224$$

$\Rightarrow 16\,x^2 = 72\,x^2 - 224 \Rightarrow 56\,x^2 = 224$

X = 2,

∴Required numbers = 6, 8

7. (b) 18 carat gold

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

20 carat gold $= \frac{5}{6}$ pure gold $= \frac{5}{6} \times 24 = 20$ carat gold

Required ratio = 18: 20 = 9: 10

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

According to question,

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

∴ x = 48

∴ Number of 50 paise coins = 48 × 3 = 144

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

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

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

10. (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, $\frac{126\times1+135\times1+2x}{1+1+2}=153$

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

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

11. (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

⇒Second number = 15x = 15 × 2 = 30

12. (c) Let number of ladies = x

and, number of gents = 2x

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

$$\Rightarrow x=4$$

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

Short-cut Method

As, $\frac{1}{2}\rightarrow\frac{1}{3}$

Total number of peoples $=\frac{(-2)(1+2)(1-3)}{1\times3-2\times1}=12$

13. (b) Let Son's share = `S;

Daughter's share = `D;

and Wife's share = `W.

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

∴ S:W:D = 9:3:1

then S = 9x, D = x

and 9x – x = 10,000 ⇒ x = ₹`1250

∴ Total worth of the property = (9+3+1) x = 13x = 13 × 1250 = `16,250

14. (c) Let the profit = x

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

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

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

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

$$=18:1:1$$

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

Investment of $A=\frac{270}{3}\times100=$`9000.

If investment of A, B and C = 18x, x and x

18x = 9000

x = 500

B investment = `500.

C investment = `500.

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

A's new salary $=\frac{115}{100}$ of 2k $=\left(\frac{115}{100}\times2k\right)=\frac{23}{10}k$

B's new salary $=\frac{110}{100}$ of 3k $=\left(\frac{110}{100}\times3k\right)=\frac{33}{10}k$

C's new salary $=\frac{120}{100}$ of

$$5k=\left(\frac{120}{100}\times5k\right)=6k$$

∴ New ratio $=\frac{23k}{110}:\frac{33k}{10}:6k=23:33:60.$

16. (d) Let number of passengers = x, 2x, 7x and Rate = 5y, 4y, 2y

Now, since income = Rate × Number of passengers

∴ Income of passengers = 5xy, 8xy, 14 xy

Income in ratio = 5: 8: 14

∴ Income from A.C. sleeper class $=\frac{5}{5+8+14}\times54{,}000=$`10,000

17. (b) C's capital $=1-\left(\frac{1}{2}+\frac{1}{8}\right)=1-\frac{5}{8}=\frac{3}{8}$

Ratio of capitals of A, B and C

$$=\left(\frac{1}{2}\times\frac{1}{4}\right):\left(\frac{1}{8}\times\frac{1}{2}\right):\left(\frac{3}{8}\times1\right)$$

$$= \frac{1}{8} : \frac{1}{16} : \frac{3}{8} = 2:1:6$$

B's share = ₹$\left(\frac{1}{9} \times 9900\right)$=`1100

18. (d) 1:2 = 3:6, so $(a^2 + b^2)/(c^2 + d^2) = 5/45 = 1/9$
From the given options, only ab/cd gives us this value.

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

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

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

20. (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.$\left(\frac{120}{100} \times 7x\right)$ *and* $\left(\frac{110}{100} \times 8x\right)$
i.e. $\frac{42x}{5}$ and $\frac{44x}{5}$
∴ Required ratio $= \frac{42x}{5} : \frac{44x}{5} = 21:22.$

21. (c) Quantity of milk = $45 \times \frac{4}{5} = 36$ litres
Quantity of water = $45 \times \frac{1}{5} = 9$ litres
Let x litres of water be added.
Then, $\frac{36}{9+x} = \frac{3}{2}$

$$\Rightarrow 72 = 27 + 3x \; or \; 3x = 45$$

or x = 15 litres

22. (d) Obviously the ratio is 2:3:4:5

23. (a) Let number be divided in ratio x:y. Then
First part $= \frac{x}{x+y}$, second part $= \frac{y}{x+y}$
Now, $\frac{1}{4}\left(\frac{x}{x+y}\right) + \frac{1}{3}\left(\frac{y}{x+y}\right) = \frac{1}{2}$

24. (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
⇒ x = 3 : y + 7 : 680 – (x + y) = 1:2:3

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

⇒ x = `112
Also y + 7 = $\frac{2}{6}$ × 690 = 230
⇒ y = `223
∴ C's share = Rs [671 – (112 + 223)] = Rs 336

25. (c) Since A:B = 3:4 … (1)
B:C = 5:6 … (2)
and C:D = 7:5 … (3)
Therefore, by, proportionating, (1) and (2)
A : B = 3 × 5 : 4 × 5 = 15 : 20
B : C = 20 : 24 and C : D = 7 : 5
Hence, A:B:C = 15:20:24 … (4)
Now, A:B:C = 15 × 7 : 20 × 7 : 24 × 7
= 105 : 140 : 168
∴C : D = 24 × 7 : 24 × 5 = 168 : 120
[By proportionating (3) and (4)]
Hence, A: B: C: D = 105: 140: 168: 120
Hence, C gets the maximum share.

26. (c) For 9 kg zinc, mixture melted = (9 + 11) kg
For 28.8 kg zinc, mixture melted
$= \left(\frac{20}{9} \times 28.8\right) kg = 64\, kg.$

27. (a) a:b:c = 2:6:3
a:b:c:d:e:f = 6:18:9:18:6:24
abc/def = 3/8

28. (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

29. (b) Let A's share = `$\frac{15}{4}x$, B's share = `4x and
C's share = `5.5x
Given $\frac{15}{4}x = 30 \Rightarrow x = 8$
∴ Total amount = 30 + 32 + 44 = `106

30. (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.
∴Gold : Copper = $\frac{7}{6} : \frac{5}{6} = 7:5.$

31. (c) Let the three containers contain 3x, 4x and 5x litres of mixtures, respectively.
Milk in 1st mix.= $\left(3x \times \frac{4}{5}\right)$litres= $\frac{12x}{5}$ litres.

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

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

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

Milk in 3rd mix.$= \left(5x \times \frac{5}{7}\right)$litres$= \frac{10x}{7}$ litres.

Water in 3rd mix.$= \left(5x - \frac{25x}{7}\right)$litres$= \frac{110x}{7}$ litres.

Total milk in final mix.

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

Total water in final mix.

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

Required ratio of milk and water

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

32. (b) In first cask,

Quantity of water $= \frac{7}{20} \times 48 = 16.8L$

Quantity of wine $= \frac{13}{20} \times 48 = 31.2L$

In second cask,

Quantity of water $= \frac{17}{35} \times 42 = 20.6L$

Quantity of wine $= \frac{18}{35} \times 42 = 21.6L$

Now after mixing.

Total quantity of wine = 52.8 L

Quantity of water = 57.2 L

Ratio after mixing $= \frac{52.8}{57.2} = \frac{528}{572} = \frac{12}{13}$

= 12:13.

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

Now, 7x – (2x + 3x) = 1500 ⇒ x= 750

∴ A's share = `2x = ` 1500

34. (a) $\frac{V}{C} = \frac{2}{3}$ and $\frac{V+4}{C} = \frac{3}{4}$ … (i)

$\therefore C = \frac{3V}{2} \Rightarrow \frac{V+4}{3V/2} = \frac{3}{4}$ [From (i)]

where V denoted for vanilla and C for chocolate.

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

35. (c) We have, $\frac{y}{x-z} = \frac{y+x}{z}$

⇒yz = xy + x^2 – yz - xz … (1)

Also, $\frac{x}{y} = \frac{y}{x-z} \Rightarrow x^2 - xz = y^2$ … (2)

From (1) and (2), we have

yz = xy – yz + y^2

⇒ 2yz = xy + y^2

∴ 2z = x + y … (3)

Checking with the options, we find that the values given in option c satisfies the equation (3)

36. (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

$(4x - 16) \times \frac{3}{4} = 3x - 12$ … (i)

and the number of female participants are

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

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

⇒ 3x – 12 = 2x + 4 ⇒ x =16.

Therefore, the total number of participants are = 4 × 16 = 64.

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

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

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 ⇒ 50x + 60x = 220 ⇒ x = 2

Wage received by a female labourer =2×4= `8

38. (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)

⇒4P + 2Px= $\frac{3}{2}$ (Px+8P)⇒8P+4Px = 3Px + 24P

⇒Px =16P ⇒ x = 16

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

39. (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)

$$\left.\begin{matrix} Breadth & 20:50 \\ Depth & 15:10 \\ Days & 10:30 \end{matrix}\right\} :: 100:x$$

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

$\Rightarrow x = \frac{50\times10\times30\times100}{20\times15\times10} \Rightarrow x = 500.$

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

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

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

41. (c) If R is the resistance, l is the length and r is radius.

$$R \propto \frac{l}{r^2}$$

$\therefore R = \frac{kl}{r^2}$ (where k is a constant)

$\therefore \frac{R_1}{R_2} = \frac{\frac{k\times162}{81}}{\frac{k\times l}{64}}$; But $R_1 = R_2$

$$\therefore \frac{k \times 162}{81} = k \times \frac{l}{64} \therefore \frac{162}{81} = \frac{l}{64}$$

$\therefore l = 128$ cms.

42. (b) 4A = 6B $\Rightarrow$ 2A = 3B $\Rightarrow$ A:B = 3:2
B = 3C $\Rightarrow$ 2B = C $\Rightarrow$B : C = 1 : 2

A	:	B	:	C
3	:	2	:	
		1		2
3	:	2	:	4

A's share $= \frac{3}{(3+2+4)} \times 1800 = \frac{3}{9} \times 1800 =$ 600

43. (c) Let 1st, 2nd and 3rd part represented by x, y, z
Let $\frac{1}{2}x = \frac{1}{3}y = \frac{1}{4}z = k$

$$\therefore x = 2k, y = 3k = 4k$$

According to question
x + y + z = 81
$\Rightarrow$ 2k + 3k + 4k = 81 $\Rightarrow$ 9k = 81 $\Rightarrow$ k = 9
Hence, parts are 18, 27, 36.

44. (c) A's total capital in partnership is 22000 × 12 = 264000.
B's total is 26000 × 12 = 312000
C's total is 34000 × 12 = 408000
Let B invested `10000 for x months then this amount will be 10000x.
Total amount is 264000 + 312000 + 408000 +10000x = 984000 + 10000x
Then, $\frac{264000}{984000+10000x} = \frac{12474}{50274} \Rightarrow x = 8$
So B supply the extra capital after 4 months.

45. (d) If A's share of capital was `x, B's share was `3x. A's capital was in the business for 12 months, and let us assume that B's capital was in it for n months.
x × 12 = 3 x (n)
n = 4
$\therefore$ B joined 8 months after A started.

46. (b) Ratio of profits = (A's `2000 for 3 months) + (A's `1500 for 5 months) + (A's `1200 for 4 months) : (B's capital x for 12 months)

$$= (6000 + 7500 + 4800): 12x = \frac{18300}{12x}$$

$$= \frac{500}{400}$$

$$\therefore \frac{1525}{x} = \frac{5}{4} \therefore x = ₹1220$$

So B's capital =`1220

47. (b) Let A contributes for x months than B contributes for (36 – x) months
Ratio of A's part to B's part $= \frac{x\times300}{(36-x)500} = \frac{3x}{180-5x}$
Then part of A in the profit of

$$`1020 = 1020 \times \frac{3x}{3x+180-5x} = 495$$

$$\frac{1020 \times 3x}{180 - 2x} = 495 \Rightarrow 3060x = 495(180 - 2x)$$

$\Rightarrow$ 3060x = 89100 – 990x
$\Rightarrow$ 4050x = 89100

$$\Rightarrow x = \frac{89100}{4050} = 22$$

So, B contributes for (36 – 22) = 14 months

48. (a) A's monthly Equivalent Investment = (2000 × 12)
B's monthly Equivalent Investment = (3000 × 4 + 4000 × 8)

C's monthly Equivalent Investment = (4000 × 9 + 3000 × 3)
Profit sharing ratio = 24000:44000:45000 = 24:44:45

$\therefore$ A's share $= \frac{24}{113} \times 8475 = 24 \times 75 =$ `1800