BHARAT SCHOOL OF BANKING
RATIO AND PROPORTION

Q 1. If Suresh distributes his pens in the ratio of 1/2 : 1/4 : 1/5 : 1/7 between his four friends A, B, C and D, then find the total number of pens Suresh should have?

a. 153
b. 150
c. 100
d. 125

View solution

Correct option : (a)

Here, A : B : C : D = 1 / 2 : 1 / 4 : 1 / 5 : 1 / 7

1) L.C.M of 2, 4, 5, 7 is 140
2) Find the number of pens each friend received --------- (To find no. of pens each friend has, multiply the ratio with the L.C.M. calculated)

A = (1/2) x 140 = 70
B = (1/4) x 140 = 35
C = (1/5) x 140 = 28
D = (1/7) x 140 = 20

3) Total number of pens = (70 x + 35 x + 28 x + 20 x) = 153 x
Minimum number of pens (x) = 1
Therefore, total number of pens = 153 pens.

Q 2. If Rs 1050 is divided into three parts, proportional to (1 / 3) : (3 / 4) : (4 / 6), then what is the first part?

a. 500
b. 300
c. 200
d. 100

View solution

Correct option : (c)

Given:

$$1050 = \frac{1}{3} : \frac{3}{4} : \frac{4}{6}$$

1) L.C.M. of 3, 4 and 6 is 12

Therefore, **multiply numerator and denominator of (1/3) with 4, to obtain denominator 12. Similarly multiply (3/4) with 3 and (4/6) with 2**

$$\frac{4}{12} : \frac{9}{12} : \frac{8}{12} = 4 : 9 : 8$$

2) If a number a is divided in three ratios x : y : z,

First Part: $\dfrac{ax}{(x + y + z)}$ ------- **(a is the number divided)**

Therefore,

First Part: $\dfrac{(1050 \times 4)}{(4 + 9 + 8)} = 200$

Alternate method:

$$1050 = \frac{1}{3} : \frac{3}{4} : \frac{4}{6}$$

L.C.M. = 12, therefore, **multiply numerator and denominator of (1/3) with 4, to obtain denominator 12. Similary multiply (3/4) with 3 and (4/6) with 2**

$$\frac{4}{12} : \frac{9}{12} : \frac{8}{12} = 4 : 9 : 8$$

Let m be one of the parts of 1050, therefore,

$$\frac{(4m + 9m + 8m)}{12} = 1050$$

Solving we get, m = 600

To calculate first part multiply m into first fraction (1/3) = $600 \times \frac{1}{3} = 200$

Type 3: Mixture of different contents

Examples:

Q 3. In a mixture of 13 litres, the ratio of milk and water is 3 : 2. If 3 liters of this mixture is replaced by 3 liters of milk, then what will be the ratio of milk and water in the newly formed mixture?

a. 10 : 3
b. 8 : 5
c. 9 : 4
d. 1 : 1

View solution

Correct option: (c)

Given: Total quantity of mixture = 13 liters

3 litres of mixture is removed from the container – So, let's forget this altogether!
Now, you are left with only 10 litres of mixture in 3:2 ratio.

$$\text{Milk in 10 litres mix} = 10 \times \frac{3}{(2 + 3)} = 6 \text{ litres}$$

$$\text{Water in 10 litres mix} = 10 \times \frac{2}{(2 + 3)} = 4 \text{ litres}$$

We add 3 litres milk to this.

So, milk in new mix is = 6 liters + 3 litres = 9 litres
Water= 4 litres

Ratio of milk : water = 9 : 4

Q 4. A mixture contains alcohol and water in the ratio of 7 : 5. If 8 liters of water is added to the mixture, then the ratio becomes 7 : 9. Find the quantity of alcohol in the given mixture?

a. 15 liters
b. 14 liters
c. 19 liters
d. 21 liters
View solution
Correct option : (b)

1) Assume quantity of milk and water to be 7x and 5x.

2) Find the total quantity of mixture (x)

Therefore,

$$\frac{7x}{(5x + 8)} = \frac{7}{9}$$

Solving this we get the value of x = 2

3) Quantity of alcohol in the mixture = (7x) = (7 x 2) = 14 liters

Type 4: Income/ Expenditure and Salary

These questions are related to annual savings or expenditure. We are asked to find

the salaries in ratio form or vice-versa.

Examples:

Q 5. The annual income of Puja, Hema and Jaya taken together is Rs. 46,000. Puja spends 70 % of income, Hema spends 80 % of her income and Jaya spends 92 % of her income. If their annual savings are 15 : 11 : 10, find the annual saving of Puja?

a. 10, 000 /-
b. 12, 000 /-
c. 17, 500 / -
d. 25, 000 /-
View solution
Correct option: (a)

Suppose income of Puja, Hema and Jaya are Rs A, Rs B and Rs C.
Annual income given is Rs 46, 000

If 70 % income is spent by Puja, then that means she saves 30 % (0.3). Similarly, Hema saves 20 % (0.2) and Jaya saves 8 % (0.08)

Given ratio of their annual savings are 15 : 11 : 10

$$\frac{(0.3A)}{15} = \frac{(0.2B)}{11} = \frac{(0.08C)}{10} = \frac{A}{50} = \frac{B}{55} = \frac{C}{125}$$

$$= \frac{A}{10} = \frac{B}{11} = \frac{C}{25} = \frac{(A + B + C)}{(10 + 11 + 25)} = \frac{46000}{46} \text{ ------ (Since, A + B + C = 46000)}$$

= 1000

From this equation, we can
A = 1000 x 10 = 10,000
B = 1000 x 11 = 11,000

C = 1000 x 25 = 25000

Q 6. A man, his wife and daughter worked in a graden. The man worked for 3 days, his wife for 2 days and daughter for 4 days. The ratio of daily wages for man to women is 5 : 4 and the ratio for man to daughter is 5 : 3. If their total earnings is mounted to Rs. 105, then find the daily wage of the daughter.

a. Rs. 15

b. Rs. 12

c. Rs. 10

d. Rs. 9

View solution

Correct option (d)

Assume that the daily wages of man, women and daughter are Rs 5x, Rs. 4x, Rs 3x respectively.

Multiply (no. of days) with (assumed daily wage) of each person to calculate the value of x.

[3 x (5x)] + [2 x (4x)] + [4 x (3x)] = 105

[15x + 8x + 12x] = 105

35x = 105

x = 3

Hence, man's daily wage = 5x = 5 x 3 = Rs. 15

Wife's daily wage = 4x = 4 x 3 = Rs. 12

Daughter's daily wage = 3x = 3 x 3 = Rs. 9

Q 7. Amit, Raju and Ram agree to pay their total electricity bill in the proportion 3 : 4 : 5. Amit pays first day's bill of Rs. 50, Raju pays second day's bill of Rs. 55 and Ram pays third day's bill of Rs. 75. How much amount should Amit pay to settle the accounts?

a. Rs. 15.25

b. Rs. 17

c. Rs. 12

d. Rs. 5

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View solution

Correct option: (d)

Toatal bill paid by Amit, Raju and Ram = (50 + 55 +75) = Rs. 180

Let amount paid by Amit, Raju and Ram be Rs. 3x, 4x and 5x respectively.

Therefore, (3x + 4x + 5x) = 180

12x = 180

x = 15

Therefore, amount paid by,

Amit = Rs. 45

Raju = Rs. 60

Ram = Rs. 75

But actually as given in the question, Amit pays Rs. 50, Raju pays Rs. 55 and Ram pays Rs. 80. Hence, Amit pays Rs. 5 less than the actual amount to be paid. Hence he needs to pay Rs. 5 to Raju settle the amount.

Q .8 Salaries of Ram and Sham are in the ratio of 4 : 5. If the salary of each is increased by Rs. 5000, then the new ratio becomes 50 : 60. What is Sham's present salary?

a. Rs. 20,000
b. Rs. 25,000
c. Rs. 30,000
d. Rs. 35,000

View solution

Correct option: (c)

Assume original salaries of Ram and Sham as 4x and 5x respectively.

Therefore,

$$\frac{(4x + 5000)}{(5x + 5000)} = \frac{50}{60}$$

60 (4x + 5000) = 50 (5x + 5000)

10 x = 50,000

5x = 25, 000

Sham's present salary = 5x + 5000 = 25,000 + 5000

Sham's present salary = Rs. 30,000

Type 5: Coins and Values

These are ratio based numericals, in which a bag containing different number of coins like 10 p, 50, 25 p are given along with the total amount and we are asked to find each type of coin in the bag or the value of coins.

Examples:

Q 9. A bag contains equal number of 25 paise, 50 paise and one rupee coins respectively. If the total value is Rs 105, how many types of each type are present?

a. 75 coins

b. 60 coins

c. 30 coins

d. 25 coins

View solution

Correct option: (b)

Bag consists of 25 paise, 50 paise and 1 rupee (100 paise) so the ratio becomes 25 : 50 : 100 or 1 : 2 : 4

Total value of 25 paise coins =(1 / 7) x 105 = 15

Total value of 50 paise coins = (2 / 7) x 105 = 30

Total value of 100 paise coins = (4 / 7) x 105 = 60

No. of 25 paise coins = 15 x 4 = 60 coins

No. of 50 paise coins = 30 x 2 = 60 coins

No. of 1 rupee coins = 60 x 1 = 60 coins

Therefore, there are 60 number of coins of each type.

Q 10. A purse contains 342 coins consisting of one rupees, 50 paise and 25 paise coins. If their values are in the ratio of 11 : 9 : 5 then find the number of 50 paise coins?

a. 180
b. 150
c. 162
d. 99
View solution
Correct option :(c)

Let the value of one rupee, 50 paise and 25 paise be 11x, 9x, 5x respectively.

No. of 1 rupee coins = (11x / 1) =11x
No. of 50 paise coins = (9x / 0.5) = 18x
No. of 25 paise coins = (5x / 0.25) = 20x

11x + 18x + 9x = 342
38x = 342
x = 9

Therefore, no. of 1 rupee coins = 11 x 9 = 99 coins
No. of 50 paise coins = 18 x 9 = 162 coins
No. of 25 paise coins = 20 x 9 = 180 coins