RATIO AND PROPORTION

Instructions

- Each question has four options (A, B, C, D). Choose the correct answer.

Questions

1. The ratio of incomes of A and B is 3:5, and the ratio of their expenditures is 2:3. If A saves 20% of his income, what percentage of his income does B save?

A) 28%

B) 30%

C) 33.33%

D) 40%

2. A mixture contains milk and water in the ratio 4:1. If 10 liters of water is added, the ratio becomes 2:1. How much milk is in the mixture?

A) 20 liters

B) 25 liters

C) 30 liters

D) 40 liters

3. The ratio of the number of boys to girls in a class is 5:3. If 4 boys leave and 2 girls join, the ratio becomes 3:2. How many students were initially in the class?

A) 124

B) 132

C) 140

D) 112

4. A sum of money is divided among A, B, and C in the ratio 2:3:5. If C's share is Rs. 1500 more than A's share, what is the total sum?

A) Rs. 3000

B) Rs. 4500

C) Rs. 5000

D) Rs. 7500

5. Two alloys contain copper and zinc in the ratios 3:2 and 4:1, respectively. In what ratio should they be mixed to obtain an alloy with a copper-to-zinc ratio of 7:3?

A) 2:3

B) 1:1

C) 4:1

D) 1:4

6. The ratio of speeds of two trains is 5:4. If the faster train covers 360 km in 3 hours, how much time will the slower train take to cover 320 km?

A) 3.33 hours

B) 3.6 hours

C) 4 hours

D) 4.5 hours

7. A, B, and C have amounts in the ratio 4:5:6. If A gives Rs. 200 to B and B gives Rs. 300 to C, the new ratio becomes 3:4:5. What is the initial amount with A?

A) Rs. 2000

B) Rs. 1000

C) Rs. 1200

D) Rs. 1600

:- Ratio And Proportion :-

1.

Ratio of income of A and B = 3:5

Ratio of expenditures of A and B = 2:3

A saves 20% of his income

Let A's income = ₹ 3x

B's income = ₹ 5x

A = 20% of 3x = ₹ 0.6x

Income - Saving = ₹ 3x - ₹ 0.6x = ₹ 2.4x

A:B = 2:3

B's expenditure = $\frac{3}{2}$ × 2.4x = 3.6x

B's Saving = ₹ 5x - ₹ 3.6x = ₹ 1.4x

28% B's income saved.

2.

Let milk = 4x and water = 1x = x

Total = 5x liters

Now, 10 liters of water is added, so new water = x+10

$$\frac{4x}{x+10} = \frac{2}{1}$$

$$\frac{4x}{x+10} = 2 \Rightarrow 4x = 2(x+10)$$

$$\Rightarrow 4x = 2x + 20$$

$$\Rightarrow 2x = 20$$

$$x = 10$$

Milk = 4x = 4×10 = 40 liters

3. Let Boys = $5x$

Girls = $3x$

After the changes

Boys : $5x-4$

Girls : $3x+2$

$$\frac{5x-4}{3x+2} = \frac{3}{2}$$

$\Rightarrow 2(5x-4) = 3(3x+2)$

$\Rightarrow 10x-8 = 9x+6$

$\Rightarrow 10x-9 = 6+8$

$x = 14$

Boys = $5x = 70$

girls = $3x = 42$

Total = $70+42 = \boxed{112}$

4.

A's share = $2x$

B's share = $3x$

C's share = $5x$

$5x-2x = 1500$

$3x = 1500$

$x = 500$

Total : $2x+3x+5x = 10x$

10×500

$= \underline{5000}$

5. alloy 1 (copper) : $\frac{3}{5} = 0.6$

alloy 2 (copper) : $\frac{4}{5} = 0.8$

Mixture required : $\frac{7}{10} = 0.7$

Alloy 1 : $(0.8 - 0.7) = 0.1$

Alloy 2 : $(0.7 - 0.6) = 0.1$

Alloy 1 : Alloy 2 = 1 : 1

6. Time = $\frac{\text{distance}}{\text{Speed}}$

Time = $\frac{320}{96}$

$= \frac{10}{3} = 3.33$ hrs

7. Let

A = 4x

B = 5x

C = 6x

A gives 200 → A's new amount : 4x − 200

B receives 200 from A, gives 300 to C = 5x + 200 − 300

= 5x − 100

C receives 300 = 6x + 300

$(4x - 200) : (5x - 100) : (6x + 300) = 3 : 4 : 5$

$\frac{4x - 200}{5x - 100} = \frac{3}{4}$

$4(4x - 200) = 3(5x - 100)$

$16x - 800 = 15x - 300$

$x = 500$

A = 1800

B = 2400

C = 3300 = 3 : 4 : 5.

= 2000