

1) Ratio of Land: water on earth is 1:2 and ratio of Land: water in northern hemisphere is 2:3 find the ratio of Land: water in southern hemisphere?

A) 4:11. B) 5:9 C) 3:7 D) 5:11

$$\begin{array}{l} L : W \\ 1 : 2 \\ 10 : 20 \end{array}$$

northern
 $2 : 3$

30 x 50%

15

L:6 W:9



$$\begin{array}{l} 5 \rightarrow 15 \\ 1 \rightarrow 3 \\ 2 \rightarrow 6 \\ 3 \rightarrow 9 \end{array}$$

$$\begin{array}{l} L : W \\ 10 - 6 \quad 20 - 9 \\ 4 : 11 \end{array}$$

2) On the whole surface of earth the ratio of land and water is 3:5. The land and water in northern hemisphere is 7:9. Then what is the ratio of land and water in southern hemisphere?

A) 6:7 B) 5:11 C) 9:2 D) 3:2

$$\begin{array}{l} L : W \\ 3 : 5 = 8 \times 4 \\ 12 : 20 = 32 \end{array}$$

$7 : 9 = 16$

16

7 : 9

$5 : 11$

3) A gold broke into parts, the ratio of weight of three part is 3:4:5. The price of gold is directly proportional to its square weight. If there is loss of Rs23500 after breaking gold then what was the starting price of gold?

- (a) 30,000. (b) 36,000. (c) 40,000. (d) 46,000

3:4:5
 $\downarrow \quad \downarrow$
 $3K \quad 4K \quad 5K = 12$
 $\downarrow \quad \downarrow \quad \downarrow$
 $9K^2 \quad 16K^2 \quad 25K^2$
 $50K^2$
 $144K^2 - 50K^2$
 $94K^2$

Initial Price = $(12K)^2$
 $144K^2$

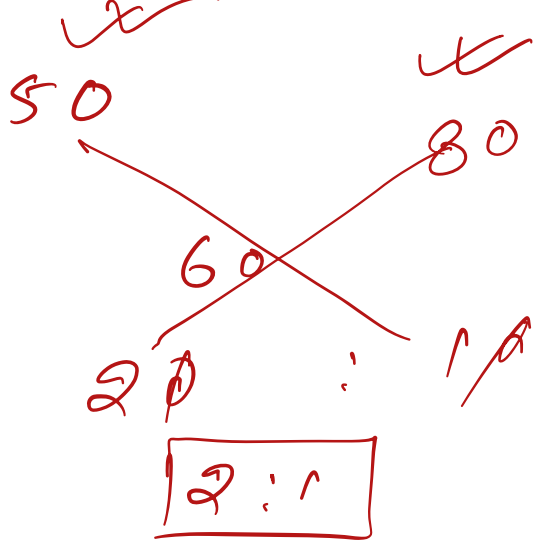
$94K^2 = 23500$
 $K^2 = \frac{23500}{94}$

Price
 $\frac{144K^2}{144} = \frac{23500}{94}$
 $144 \times 250 = 36000$

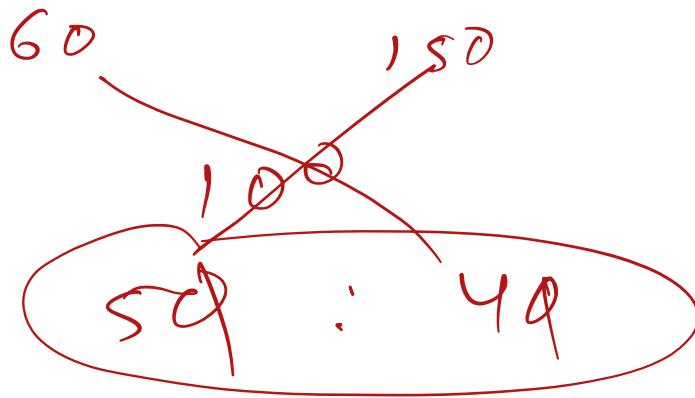
4) In what ratio should coffee powder costing Rs.2500 per kg be mixed with coffee powder costing Rs.1500 per kg so that the cost of the mixture is Rs.2250 per kg?

- (a) 1:4. (b) 4:1. (c) 3:1. (d) 1:3

2500 1500
 $\swarrow \quad \searrow$
 2250
 $\swarrow \quad \searrow$
 $750 \quad : \quad 250$
 $3 \quad : \quad 1$



100



60 \checkmark kg

AV

AV

AV

$\bar{AV} = \frac{SUM}{NO}$

NO.

NO

$P\%$ $P\%$
 $P\%$

S S

S

$S = \frac{P}{T}$

$\frac{CP}{Q} : \frac{CP}{Q}$
 $Q : Q$

T

T

$P\% \geq \frac{P}{CP} \times 100$

5) A shopkeeper bought one type of rice at Rs. 12 per kg and other type at Rs. 16.25 per kg. After mixing both types of rice he fixed the cost of mixture as Rs. 14.75 per Kg. If the total quantity of the rice be 85 kg, Find the quantity of first type of rice.

- (a) 55 kg (b) 30 kg (c) 35 kg (d) 40 kg

$$\begin{array}{r}
 \text{I} \quad \text{II} \\
 12 \quad 16.25 \\
 \hline
 14.75 \\
 \hline
 1.50 : 2.75 \\
 30 : 55 \\
 \hline
 6 : 11
 \end{array}$$

$$\begin{array}{r}
 17 \rightarrow 85 \text{ kg} \\
 1 \rightarrow 5 \text{ kg} \\
 6 \rightarrow 30 \text{ kg}
 \end{array}$$

6) How many kg of rice worth Rs. 25 per kg must be mixed with 30 kg of rice worth Rs. 30 per kg so that by selling the mixture at Rs. 29.7 per kg, there is a gain of 10%?

- (a) 25 kg. (b) 45 kg. (c) 60 kg. (d) 27 kg

$$\begin{array}{r}
 \text{I} \quad \text{II} \rightarrow 30 \text{ kg} \\
 25 \quad 30 \\
 \hline
 29.7 \\
 \hline
 3 : 2 \\
 2 \rightarrow 30 \\
 1 \rightarrow 15 \\
 3 \rightarrow 45
 \end{array}$$

$$\begin{array}{r}
 \text{SP } 29.7 \quad P = 10\% \\
 = \frac{1}{10} \\
 11 \rightarrow 29.7 \\
 10 \rightarrow 29.7 \times 10 \\
 \hline
 11 \\
 \hline
 \text{CP} : 10 \\
 \text{SP} : 11
 \end{array}$$

7) In what ratio must a grocer mix tea at Rs.72/kg, and Rs.90/kg, so that by selling the mixture at Rs.99.6/kg. He may gain 20% ?

- (a) 2:3. (b) 7:11. (c) 3:7. (d) 13:19

$$\begin{array}{r} 72 \quad 90 \\ \diagdown \quad \diagup \\ 88 \\ \diagup \quad \diagdown \\ 7 \quad 11 \end{array}$$

99.6 S.P

6 → 99.6 P.% = 20%
 1 → 99.6 = $\frac{1}{5}$
 5 → 99.6 CP = 5
 5 → 99.6 × 5 SP = 6
 830

8) How many kg of rice costing Rs. 42 per kg should be mixed with ~~7 1/2~~ kg rice costing Rs. 50 per kg so that by selling the mixture at Rs. 53.10 per kg, there is a gain of 18%?

- (a) 12 1/2. (b) 10 1/2. (c) 8. (d) 9

$$\begin{array}{r} 42 \quad 50 \\ \diagdown \quad \diagup \\ 45 \\ \diagup \quad \diagdown \\ 5 \quad 3 \end{array}$$

$$\frac{15}{2} \times \frac{5}{3} = \frac{25}{2}$$

53.10

CP = 53.10 × $\frac{100}{118}$
 50

$$\frac{5310}{118}$$

9) A trader has 760 kg of rice, a part of which he sells at 13% profit and the rest at 7% loss. He gains 4% on the whole. How much was sold at 13% gain?

- (a) 418kg. (b) 342kg (c) 380kg. (d) 437kg

$$\begin{array}{r} 13 \\ - 7 \\ \hline 4 \end{array}$$

$$\frac{11}{9}$$

$$\frac{38}{760} \times \frac{11}{20}$$

$$418$$

10) A shopkeeper has 100 kg of rice. He sells 25 kg at some profit and sell remaining part at 8% profit. If he earns 10% profit on whole transaction then find at what % profit he sells 25kg rice .

- (a) 15%. (b) 16% (c) 20% (d) 18%

$$\begin{array}{r} 100 \\ \swarrow \searrow \\ 25 \times 7 \\ 75 \times 8 \\ \hline 10 \end{array}$$

$$\frac{10 \times 6}{2} = \frac{3}{6}$$

11) Bottie 1 contains a mixture of milk and water in 7: 2 ratio and Bottle 2 contains a mixture of milk and water in 9: 4 ratio. In what ratio of volumes should the liquids in Bottle 1 and Bottle 2 be combined to obtain a mixture of milk and water in 3:1 ratio?

- (a) 27:14 (b) ~~27:13~~ (c) 27: 16 (d) 27: 18

$$\begin{array}{c} W \\ \frac{2}{9} \end{array} \quad \begin{array}{c} W \\ \frac{4}{13} \end{array}$$

$$\frac{\frac{4}{13} - \frac{1}{4}}{\frac{16-13}{13 \times 4}} : \frac{\frac{1}{4} - \frac{2}{9}}{\frac{9-8}{4 \times 9}}$$

$$\frac{3}{13} : \frac{1}{9} \\ 27 : 13$$

12) Vessels A and B contain mixtures of milk and water in the ratios 4:3 and 7:4 respectively. In what ratio should quantities of mixture be taken from A and B to form a mixture in which water and milk is in the ratio 19: 31?

- (a) 62: 185. (b) 101: 177. (c) ~~63: 187~~ (d) 23:50

$$\frac{3}{7}$$

$$\frac{4}{11}$$

$$\frac{200}{4} \quad \frac{19}{50}$$

$$\frac{\frac{19}{50} - \frac{4}{11}}{\frac{209-200}{50 \times 11}} : \frac{\frac{3}{7} - \frac{19}{50}}{\frac{150-133}{7 \times 50}}$$

$$\frac{9}{11} : \frac{17}{7}$$

$$63 : 187$$

13) Two vessels A and B contain milk and water mixed in the ratio 8: 5 and 5: 2 respectively. The ratio in which these two mixtures be mixed to get a new mixture containing $69 \frac{3}{13}\%$?

- (a) 4:9. (b) 2:7. (c) 3:5. (d) 4:7

$$\begin{aligned} \frac{8}{13} & \quad \frac{5}{7} \\ \frac{9}{13} & \\ \frac{5}{7} - \frac{9}{13} & : \frac{9}{13} - \frac{8}{13} \\ \frac{65-63}{7 \times 13} & : \frac{1}{13} \\ 2 & : 7 \end{aligned}$$

$$69 \frac{3}{13} \% = \frac{9}{13}$$

14) A and B are solutions of acid and water. The ratios of water and acid in A and B are 4:5 and 1:2, respectively. If x litres of A is mixed with y litres of B, then the ratio of water and acid in the mixture becomes 8:13. What is x:y?

- (a) 5:6. (b) 2:5. (c) 3:4. (d) 2:3

$$\begin{aligned} \frac{4}{9} & \quad \frac{1}{3} \\ \frac{8}{21} & \\ \frac{8}{21} - \frac{1}{3} & : \frac{4}{9} - \frac{8}{21} \\ \frac{24-21}{21 \times 3} & : \frac{84-72}{9 \times 21} \\ \frac{3}{7} & : \frac{12}{97} \end{aligned}$$

15). Two vessels A and B contain milk and water mixed in the ratio 5: 3 and 2: 3. When these mixture are mixed to form a new mixture containing half milk and half water, they must be taken in the ratio

- (a) 2:5. (b) 3:5. (c) 4:5 (d) 7:3

$$\frac{3}{8} \quad \frac{3}{5}$$

$$\frac{1}{2}$$

$$\frac{3}{5} - \frac{1}{2} : \frac{1}{2} - \frac{3}{8}$$

$$\frac{1}{8 \times 4} = \frac{1}{8 \times 4}$$

$$4:5$$

16). A person purchase 2 different kinds of alcohol. In the 1st mixture the ratio of alcohol to water is 3:4 and in the 2nd mixture is 5:6. If he mixes the two given mixtures and makes a third mixture of 54L in which the ratio of alcohol to water is 4:5 the quantity of 1st mixture (whose ratio is 3:4) is required to make the 54L of the 3rd kind of mixture is?

- (a) 16. (b) 21. (c) 18. (d) 24

$$\frac{3}{7} \quad \frac{5}{11}$$

$$\frac{4}{9}$$

$$\frac{5}{11} - \frac{4}{9} : \frac{4}{9} - \frac{3}{7}$$

$$\frac{1}{11 \times 9} : \frac{1}{9 \times 7}$$

$$7:11$$

$$44$$

$$54$$

$$4:5$$

$$54 \times \frac{7}{18}$$

$$21$$

17) Solution A contains 10% acid and sol B contains 30% acid. In what ratio should sol A be mixed with sol B to obtain a mixture with 25% acid?

- (a) 1:2. (b) 2:1. (c) 1:3. (d) 2:1

$$\begin{array}{ccc} 10 & & 30 \\ & \searrow & \swarrow \\ & 25 & \\ & \swarrow & \searrow \\ 5 & : & 15 \\ & \swarrow & \searrow \\ & 1 & : 3 \end{array}$$

18). 300 grams of sugar solution has 40% of sugar in it. How much sugar should be added to make to 50% in the solution?

- (a) 40 gram. (b) 10 gram. (c) 60 gram. (d) 80 gram

$$\begin{array}{ccc} 40\% & & 100\% \\ & \searrow & \swarrow \\ & 50\% & \\ & \swarrow & \searrow \\ 50 & : & 100 \\ & \swarrow & \searrow \\ & 1 & : 2 \end{array}$$

$$\begin{array}{r} 60 \\ 300 \times \frac{1}{5} \\ \hline 60 \text{ gm} \end{array}$$

$$\begin{array}{ccc} S & : & W \\ 2 & & 3 \\ \hline 1 & : & 1.5 \\ \hline 2 & : & 3 \end{array}$$

$$\begin{array}{r} 60 \\ 300 \times \frac{1}{5} \\ \hline 60 \end{array}$$

19) A container contains 20 L mixture in which there is 10% sulphuric acid. Find the quantity of sulphuric acid to be added in it to make the solution containing 25% sulphuric acid.

- (a) 3 L (b) 5 L (c) 4 L (d) 2 L

$$10\% = \frac{1}{10}$$

$$S : 40$$

$$1 : 9$$

$$1 : 3 \times 3$$

$$+2 \quad 3 : 9$$

$$10 - 20$$

$$1 \rightarrow 2$$

$$2 \rightarrow 4$$

$$10 \quad 100$$

$$S \quad 25$$

$$75 : 18$$

$$S : 1$$

$$S \rightarrow 20$$

$$1 - (4)$$

20) A bottle full of whisky contains 50% alcohol. A part of this whisky is replaced by another containing 18% alcohol and the percentage of alcohol was found to be 26%. The quantity of whisky replaced is:

- A) 3/4. B) 1/3. C) 5/8. D) 1/2

$$50\% \quad 18\%$$

$$26\%$$

$$8 : 24$$

$$1 : (3)$$

$$\frac{3}{4}$$

21) . If a dairy mixes cow's milk which contains 10% fat with buffalo's milk which contains 20% fat, then the resulting mixture has (120/7)% of fat. What ratio was the cow's milk mixed with buffalo's milk?

- (a) 2:5. (b) 1:5. (c) 2:3. (d) 2:1

$$\begin{array}{r} 10 \quad 20 \\ 120 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 70 \quad 140 \\ 120 \\ \hline 20 : 50 \end{array}$$

22) . A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800 gm. If half litre of the mixture weighs 480 gm, then the percentage of liquid 1 in the mixture, in terms of volume, is

- (a) 70. (b) 85. (c) 75. (d) 80

$$\begin{array}{r} 1000 \quad 800 \\ 960 \\ \hline 160 : 40 \\ 4 : 1 \end{array}$$

$$\begin{array}{r} \frac{1}{2} \rightarrow 480g \\ 1 \rightarrow 960 \\ \hline 4 \times 100 \\ \hline 8 \end{array}$$

23) A man has 960 pens of three types such that he earns a profit of 10%, 11% and 14% respectively. On each type he earns profit of $10\frac{4}{9}\%$ in first two types and $12\frac{2}{3}\%$ overall profit on all types. Find the no. of pens in all three type?

(a) 240, 180, 540. (b) 160, 200, 600

(c) 250, 260, 450 (d) 200, 160, 600

$$\begin{array}{ccc} A & B & C \\ 10\% & 11\% & 14\% \\ 10 & 11 & 14 \\ 10\frac{4}{9}\% & 11\% & 14\% \\ 10\frac{4}{9} & 11 & 14 \\ 5 & 4 & 3 \\ 5:4 & = & 9 \end{array}$$

$$\begin{array}{ccc} A+D & C & 14-12-\frac{2}{3} \\ 10\frac{4}{9} & 14 & 2-\frac{2}{3}-\frac{1}{3} \\ 12\frac{2}{3} & & 12+\frac{2}{3}-10-\frac{4}{9} \\ \frac{14}{3} & : & \frac{20}{9} \\ 3(3:5) & & 2+\frac{2}{9} \\ 9:15 & & \frac{20}{9} \end{array}$$

$$\begin{array}{l} 24 \rightarrow 960 \\ 1 \rightarrow \frac{960}{24} = 40 \end{array}$$

$$\begin{array}{l} A = 5 \times 40 = 200 \\ B = 4 \times 40 = 160 \\ C = 3 \times 40 = 120 \end{array}$$

24) Three classes: X, Y and Z, take a test. The average score in class X is 83. The average score in class Y is 76. The average score in class Z is 85. The average score of all students in classes X and Y together is 79. The average score of all students in classes Y and Z together is 81. What is the average score for all the three classes, taken together?

A) 80.2 B) 81.8 C) 80.5 D) 81.5

$$\begin{array}{ccc} X & Y & Z \\ 83 & 76 & 85 \\ 79 & 81 & \end{array}$$

$$\begin{array}{ccc} X & Y & Z \\ 3 & 4 & 5 \end{array}$$

$$80$$

$$\begin{array}{ccc} X & Y & Z \\ 83 & 76 & 85 \\ 79 & 81 & \end{array}$$

$$\begin{array}{ccc} X & Y & Z \\ 83 & 76 & 85 \\ 3 & 4 & 5 \end{array}$$

$$\begin{array}{l} 140 = 3 \times 3 - 4 \times 4 + 5 \times 5 = 9 - 16 + 25 \\ = \frac{18}{12} = 1.5 \\ 80 + 1.5 = 81.5 \end{array}$$

25) In an alloy 80% copper and rest is tin. in another alloy copper 85% and 13% tin. Both alloys are mixed in which ratio such that % of tin becomes 15% in resultant mixture.

- (a) 5:2. (b) 2:3. (c) 2:5. d) 3:2

$$\begin{array}{r} 20 \\ 15 \end{array} \begin{array}{r} 13 \\ 15 \end{array}$$

$$2 : 5$$

26) In a alloy 81% copper and 19% tin. In another alloy 63% copper, 10% tin and remaining are impurities. Both alloys are mixed such that then % of tin becomes 15%. Find the % of copper in new mixture.

- (a) 85% (b) 73%. (c) 82%. (d) 72%

$$\begin{array}{r} 19 \\ 10 \end{array} \begin{array}{r} 15 \\ 10 \end{array}$$

$$5 : 4$$

$$\begin{array}{r} 81 \\ 5 \end{array} \begin{array}{r} 63 \\ 4 \end{array}$$

$$\begin{array}{r} 70 \\ 55 - 7 \times 4 \\ \hline 90 \\ 55 - 28 \\ \hline 27 \\ 9 \end{array} = \frac{27}{9} = 3$$

$$70 + 3 = 73\%$$

$$\begin{array}{r} 81 \\ 10 \end{array} \begin{array}{r} 63 \\ 10 \end{array}$$

$$5 : 4$$

$$\begin{array}{l} 9 \rightarrow 18 \\ 1 \rightarrow 2 \\ 5 \rightarrow 10 \end{array}$$



27) . An Alloy A of gold and silver contains 89% gold and 11% silver a second alloy B of gold and silver contains 75% gold and 9% silver and rest part is impurities, an alloy C is made by mixing alloy A and alloy B and it contains 100% silver. Find gold % in C?

- (a) 84%. (b) 85%. (c) 85.5%. (d) 86%

28) . In a alloy 82% copper and 18% tin another alloy 70% copper, 6% tin and remaining are impurities. Both alloys are mixed such that then the % tin in new mixture becomes 11%. Find the % of impurities in new mixture?

- A)12%. B)14% C)18%. D)16%

$$\begin{array}{r} 18 \quad 6 \\ 11 \quad \times \\ \hline 5 : 7 \end{array}$$

$$\begin{array}{r} 70 + 6 = 76 \\ \textcircled{24} \\ 7 \times 24^2 \\ \hline 12 \end{array}$$

29) In a class of 50 students, 40% are girls. The average marks of the whole class are 64.4 and the average of the boys' marks is 62. What is the average marks of the girls?

- (a) 67 (b) 66.8 (c) 66.4 (d) 68

Handwritten solution for Question 29:

68 is circled in red and crossed out with a red line.

62

64.4

40 : 3.6

2 : 62

3 ✓

2.4 × 3

7.2

30) A car travel 20 kmph for 30 min and at x kmph for 45 min. If the average speed of the car for entire journey is 14 kmph, find the value of x.

- (a) 10 kmph. (b) 15 kmph. (c) 12 kmph. (d) 20 kmph

Handwritten solution for Question 30:

20

14

30

2

4

45

3

6

4

6 × 2

12

8