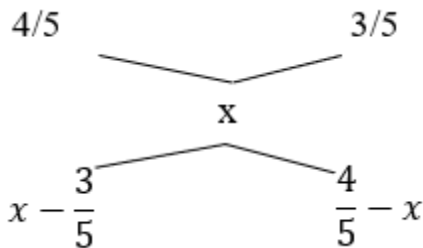# Mixture and Alligation Questions for CAT

Question-1 Milk and water are mixed in a vessel A as 4:1 and in vessel B as 3:2. For vessel C, if one takes equal quantities from A and B, find the ratio of milk to water in C.

Answer- 7:3

Explanation- Quantity of milk in vessel A = 4/5
Quantity of milk in vessel B = 3/5

Let x be the quantity of milk in vessel C

$$
\begin{array}{ccc}
4/5 & & 3/5 \\
& \diagdown \quad \diagup & \\
& x & \\
& \diagup \quad \diagdown & \\
x - \dfrac{3}{5} & & \dfrac{4}{5} - x
\end{array}
$$

Since equal quantity from A and B are taken. Therefore,

$$x - \frac{3}{5} = \frac{4}{5} - x$$
$$x = \frac{1}{2} \times \frac{7}{5} = \frac{7}{10}$$

Quantity of milk in vessel C = 7/10
Quantity of water in vessel C = 3/10
Required ratio = 7:3

Question-2 640 ml of a mixture contains milk and water in a ratio 6:2. How much of the water is to be added to get a new mixture containing half milk and half water?

Answer- 320 ml

Explanation- Milk $= 640 \times \frac{6}{8} = 480$ ml
Water $= 640 - 480 = 160$ ml

Let x litres of water are to be added. Therefore,

$$\frac{480}{160 + x} = \frac{1}{1}$$
$$x = 480 - 160 = 320 \ ml$$

Question-3 A tin is a mixture of two liquids A and B in the proportion 4: 1. If 45 liters of the mixture is replaced by 45 liters of liquid B, then the ratio of the two liquids becomes 2: 5. What was the initial quantity of mixture in tin?

Answer- 70 litres

Explanation- Total quantity of liquid $= 5x$

Amount of liquid A replaced $= 45 \times \frac{4}{5} = 36$ liters

Amount of liquid B replaced $= 45 - 36 = 9 \ liters$ $\frac{4x - 36}{x - 9 + 45} = \frac{2}{5}$
$$20x - 180 = 2x + 72$$
$$x = \frac{252}{18} = 14$$
Hence, the quantity of mixture = 5x = 70 liters

Question-4 An alloy of copper and bronze weight 50 gm. It contains 80% Copper. How much copper should be added to the alloy so that percentage of copper is increased to 90%?

Answer- 50 gm

Explanation- Initial quantity of Copper $= 50 \times \frac{80}{100} = 40$ gm

The initial quantity of Bronze $= 50 - 40 = 10$ gm

$$(50 + x) \times \frac{90}{100} = 40 + x$$
$$450 + 9x = 400 + 10x$$
$$x = 50 \ gm$$

Question-5 In what ratio sugar at Rs 30/kg should be mixed with sugar at Rs 45/kg so that on selling the mixture at Rs 42/kg there is a profit of 20%?

Answer- 2:1

Explanation- Given: SP of Mixture = Rs42/kg

And profit = 20%
Therefore, CP of Mixture = 42 × (100/120)
= Rs35/kg
By the method of allegation,
30   45
     35
10   :   5
Thus, the required ratio is 2 : 1.