## QUANTITATIVE ABILITY I

### Mixture and Alligation

**Q.1 A jar had 330-liter mixture of Milk and water in the respective ratio of 2 : 1.60 liters of this mixture is taken out and 'x' liter each of milk and water is added to the jar (remaining mixture). The respective ratio between milk and water was 8 :5 respectively. What was the total quantity of both milk and water added to the jar?**

a) 90 liter

b) 170 liter

c) 160 liter

d) 120 liter

**Answer: d**

**Solution:**

Given

Total mixture = 330 liter

Ratio of milk and water = 2 : 1

Calculation

Mixture left in jar after 60 liters taken out = 330 – 60 = 270 liters

Milk = (2/3) × 270 = 180 liter

Water = (1/3) × 270 = 90 liter

Now according to question

(180 + x)/(90 + x) = 8/5

⇒900 + 5x = 720 + 8x

⇒3x = 180

⇒x = 60

∴Quantity that was added = 2 × 60 = 120 liter

**Q2. A cistern contains 100 liters of water. 10 liters of water is taken out of it and replaced by the same quantity of soda. This process is repeated one more time. After that 20 liters of the solution is replaced by the same quantity of whiskey. Find the proportion of soda, water, and whiskey in the final mixture?**

a) 19 : 71 : 25

b) 38 : 72 : 50

c) 19 : 81 : 25

d) 29 : 71 : 25

**Answer: c**

**Solution:**

Given

A cistern contains 100 liters of water.

Calculation

Initially

Water = 100 lit

After 1st replacement

Water : Soda = 90 : 10 = 9 : 1

After 2nd replacement

Water = 90 – (10 × 9/10) = 81 lit

Soda = 10 – (10 × 1/10) + 10 = 19 lit

After 3rd replacement

Water = 81 – (20 × 81/100) = 64.8 lit

Soda = 19 – (20 × 19/100) = 15.2 lit

Whiskey = 20 lit

∴Required ratio = 15.2 : 64.8 : 20

⇒19 : 81 : 25

**Q.3) Ratio of Milk and water in Vessel A is 7:4 and same mixture in the ratio of 5:3, 22 liters mixture from vessel A taken out and poured in vessel B new ratio of milk to water is 27:16. If new quantity of mixture in vessel B is equal to initial quantity of mixture in vessel A, then find quantity of Milk after 8 liters of mixture has been taken out from Vessel A?**

A) 200/29 liters
B) 546 / 11 liters
C) 120/13 liters
D) 220/19 liters
**Answer: b**

Let Ratio of Milk and water in Vessel A is 7x and 4y

Let ratio of milk and water in vessel B is 5y and 3y

Now according to question.

(5y + 22 * 7 / 11) / (3y + 22 * 4 / 11) = 27 / 16

(5y + 14 )/ (3y + 8) = 27 / 16

80y + 224 = 81y + 216

Y = 8

New quantity of mixture in vessel B

= > (8 * 5 + 14) + (8 * 3 + 8)

= > 54 + 32

= > 86

Therefore initial quantity of vessel A = 86 liters

Quantity of milk remaining in Vessel A

86 * 7 / 11 – 8 * 7 / 11

= > 546 / 11 litres

**Q4. X and Y two alloys are made by mixing aluminum and magnesium metals in the ratio of 8: 5 and 9:16 respectively. If equal amounts of alloys are melted to form a new alloy Z, what will be the ratio of aluminum and magnesium in Z?**

a) 317:333

b) 316:319

c) 314:333

d) 313:317

**Answer: a**

**Solution:**

The ratio of aluminum and magnesium in Z = [8/13+9/25] : [5/13+16/25]

= 317/325 : 333/325

= 317:333

**Q5. How many kilograms of sugar of Rs.5.4 per kg should be mixed with 10 kg of sugar of Rs.4.5 per kg, such that there may be gain of 20% by selling the mixture at Rs.5.94 per kg.**

a) 10 kg

b) 12 kg

c) 15 kg

d) 8 kg

**Answer: A**

**Solution:**

Let, the amount of rice of Rs.5.4 per kg = x kg

According to the question,

$x \times 5.4 + 4.5 \times 10 = 5.94 \times (10 + x) \div 120 \times 100$

$=5.4x + 45 = 4.95 \times (10 + x)$

$=5.4x + 45 = 49.5 + 4.95x$

$=5.4x - 4.95x = 49.5 - 45$

$=0.45x = 4.5$

$=x = 10\ kg$