



Date : 8th Dec 2023

Quantitative Aptitude - Mixtures and Alligation

English

**Q:1** From a mixture of petrol and diesel,  $\frac{7}{8}$ th of the mixture is taken out and replaced with equal quantity of diesel. If initial and final ratio of petrol and diesel in the mixture is 2 : 1 and 1 : 11 then what is the quantity (In litre) of the mixture?

1. 48
2. 40
3. 56
4. 64
5. Can't be determined

**Q:2** Two equal containers A and B have a mixture of Soda and Water in the form of a ratio 3 : 1 and 7 : 5. If mixed together and placed in container C then, find the final ratio of Soda and Water in container C.

1. 1 : 2
2. 5 : 3
3. 3 : 7
4. 2 : 1
5. 4 : 3

**Q:3** During an experiment, a test tube containing 200 ml oil broke and it was mixed with 4 liters of water. When 350 ml of this mixed solution is taken as a sample, what is the volume of oil present in the sample?

1. 21.66 ml
2. 24.66 ml
3. 16.66 ml
4. 19.33 ml
5. None of these

**Q:4** A trader mixes 14 kg rice of variety A cost price of which is Rs.60/kg with 18 kg of quantity of type B rice. He sells the mixture at Rs. 65/kg and earns a profit of 100/3%. Find the cost price of type B rice.

1. 30
2. 20
3. 40
4. 45
5. 50

**Q:5** In 64 litres of pure milk, 20 litres of water is mixed and then  $\frac{1}{4}$ th of the mixture is taken out. If x litre of water is added again then, the ratio of water to that of the milk becomes 1 : 2. Find the value of x.

1. 10
2. 8
3. 12
4. 6
5. 9

**Q:6** A container has a 126-liter mixture of water and sugar in ratio 11 : 10. How much water be added to make the ratio 5 : 3.

1. 84 liter
2. 54 liter
3. 34 liter
4. 52 liter
5. 126 liter

**Q:7** A container contains a mixture of two liquids, milk and water in the ratio 3 : 1. When 9 liters of the mixture is replaced by 9 liters of water, the ratio becomes 3 : 4. Find the initial quantity of milk.

1. 15.75 litre
2. 12.5 litre
3. 37 litre
4. 20.25 litre
5. 32 litre

**Q:8** How many kgs of rice costing Rs. 40/kg should be mixed with 20 kgs of other variety of rice costing Rs. 24/kg, so that the shopkeeper gets a total profit of 20% on selling the total mixture of these two varieties at Rs. 30/kg?

1. 7.5 kgs
2. 4.52 kgs
3. 1.33 kgs
4. 7.41 kgs
5. 6.5 kgs

**Q:9** A Container contains 'X' Liters of Milk. A thief stole 50 litres of Milk and replaced it with the same quantity of water. He repeated the same process further two times and thus Milk in the container became only 'X - 122' litres. What is the quantity of water in the final mixture?

1. 95 litres
2. 108 litres
3. 122 litres
4. 156 litres



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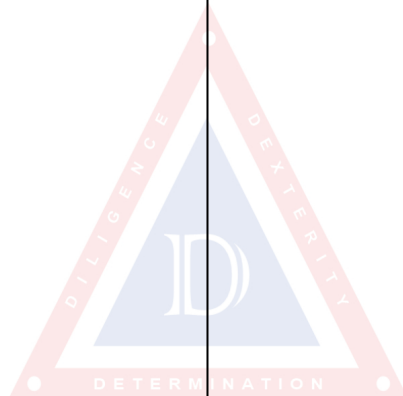
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5. 142 litres

**Q:10** A milk vendor has 2 cans. The first contains 25% of water and 75% of pure milk. The second contains 50% water. How much he should mix from each can so that he would get 12 liters of milk with the ratio of water and milk, 3 : 5?

1. 4 litres, 8 litres
2. 6 litres, 6 litres
3. 5 litres, 7 litres
4. 7 litres, 5 litres
5. 8 litres, 4 litres



### Answer Key

1. (5)	2. (4)	3. (3)	4. (3)	5. (5)
6. (3)	7. (1)	8. (3)	9. (3)	10. (2)

### Answers and Solutions

**Q:1** The correct answer is **option 5** i.e. **Can't be determined**

Suppose the quantity of mixture is X litre.

And Initial ratio of petrol and diesel in the mixture is 2 : 1

So, Initial quantity of petrol =  $2X/3$

Initial quantity of diesel =  $X/3$

7/8th of the mixture is taken out and replaced with equal quantity of diesel

So, Final quantity of petrol =  $(2X/3) \times 1/8 = X/12$

Final quantity of diesel =  $(X/3) \times 1/8 + 7X/8 = 11X/12$

Final ratio of petrol and diesel in the mixture is 1 : 11

So,  $X/12 : 11X/12 = 1 : 11$

one value of X can't be determined.

**Short Trick:** Since any numerical value of quantity of petrol or diesel is not given (Only ratios are given), one value of total quantity of mixture is not possible.

**Q:2** The correct answer is **Option 4** i.e. **2 : 1**.

Soda	Water
$3/4 + 7/12$	$1/4 + 5/12$
$16/12$	$8/12$

So, for container C

$\Rightarrow$  Soda : Water = 16 : 8

$\Rightarrow$  Soda : Water = 2 : 1

**Q:3** The correct answer is **Option 3** i.e. **16.66 ml**.

Given,

$\Rightarrow 4000 + 200$  i.e. 4200 ml of mixture contains 200 ml of oil

So, 350 ml of the mixture will contain:

$\Rightarrow 200/4200 \times 350 = 100/6 = 16.66$  ml of oil

**Q:4** The correct answer is **Option 3** i.e. **40**

Let the cost price of type B rice = Rs. x

Let the cost price of resulting mixture = Rs. y

Given, Selling price of resulting mixture = Rs. 65 = 100/3% of y

y = Rs. 48.75

By the concept of alligation,



$(48.75 - x)/11.25 = 14/18$

$360 = 9x$

x = Rs. 40

**Q:5** The correct answer is **Option 5** i.e. **9**.

Initial mixture = 64 litres of pure milk & 20 litres of water

When 1/4<sup>th</sup> of the mixture is taken out

Remaining milk in the mixture =  $64 \times 3/4 = 48$  litre

Remaining water in the mixture =  $20 \times 3/4 = 15$  litre

When x litre of water is added again:

$\Rightarrow 48/(15 + x) = 2/1$

$\Rightarrow 30 + 2x = 48$

$\Rightarrow 2x = 18$

$\Rightarrow x = 9$

**Q:6** The correct answer is **Option 3** i.e. **34 liter**.

As we know the initial ratio of water and sugar is 11 : 10

After mixing water it becomes 5 : 3, so the quantity of sugar remains the same.

11 : 10 can be written as 33 : 30

5 : 3 can be written as 50 : 30

The quantity of sugar remains the same but the water changes from 33 to 50

Total Quantity =  $33x + 30x = 126$

$\Rightarrow 63x = 126$

$\Rightarrow x = 2$

Change in quantity of water =  $17x = 34$  liter

**Q:7** The correct answer is **Option 1** i.e. **15.75 litre**.

The initial ratio of the milk and water = 3 : 1

So, the initial quantity of the milk =  $3/4$

The final ratio of the milk and water = 3 : 4

So, the final quantity of the milk =  $3/7$

Used replace method,

Final quantity = Initial quantity { 1 - (replace



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$$\begin{aligned} & \text{quantity/total volume} \} \\ \Rightarrow 3/7 &= 3/4 \times \{1 - (9/V)\} \\ \Rightarrow 4/7 &= (V - 9)/V \\ \Rightarrow 4V &= 7V - 63 \\ \Rightarrow V &= 21 \end{aligned}$$

So, the initial value of the milk =  $3/4 \times 21 = 15.75$  litre

**Q:8** The correct answer is **Option 3** i.e. **1.33 kgs.**

Let the amount of rice of 1st type mixed be X kgs.

Profit made by the shopkeeper by selling the mixture at Rs. 30/kg = 20%

The cost price of the mixture =  $(30/120) \times 100 = \text{Rs } 25/\text{kg}$

Thus, According to the question -

$$\Rightarrow (X \times 40) + (20 \times 24) = 25(X + 20)$$

$$\Rightarrow 40X + 480 = 25X + 500$$

$$\Rightarrow 40X - 25X = 500 - 480$$

$$\Rightarrow 15X = 20$$

$$\Rightarrow X = 4/3 \text{ kgs} = 1.33 \text{ kgs}$$

**Q:9** The correct answer is **option 3** i.e. **122 litres**

In general the quantity of the mixture remains equal after every operation.

Thus, X is the initial quantity and to get the quantity of milk we have  $X - 122$ , where 122 litre is the value of water.

$X - 122 = \text{Quantity of milk}$ , where 122 litre is the quantity of water.

**Q:10** The correct answer is **Option 2** i.e. **6 litres, 6 litres.**

Amount of milk in 1st can =  $75\% = 3/4$

Amount of milk in 2nd can =  $50\% = 1/2$

Required milk in resulting mixture =  $5/8$

Thus by alligation,

$$\begin{array}{ccc} \frac{3}{4} & & \frac{1}{2} \\ & \searrow \quad \swarrow & \\ & \frac{5}{8} & \\ & \swarrow \quad \searrow & \\ \frac{1}{8} & & \frac{1}{8} \end{array}$$

Ratio in which both can should be mixed =  $1/8 : 1/8$   
= 1 : 1

Thus quantity of both cans that should be mixed =  $1/2 \times 12 = 6$  litres