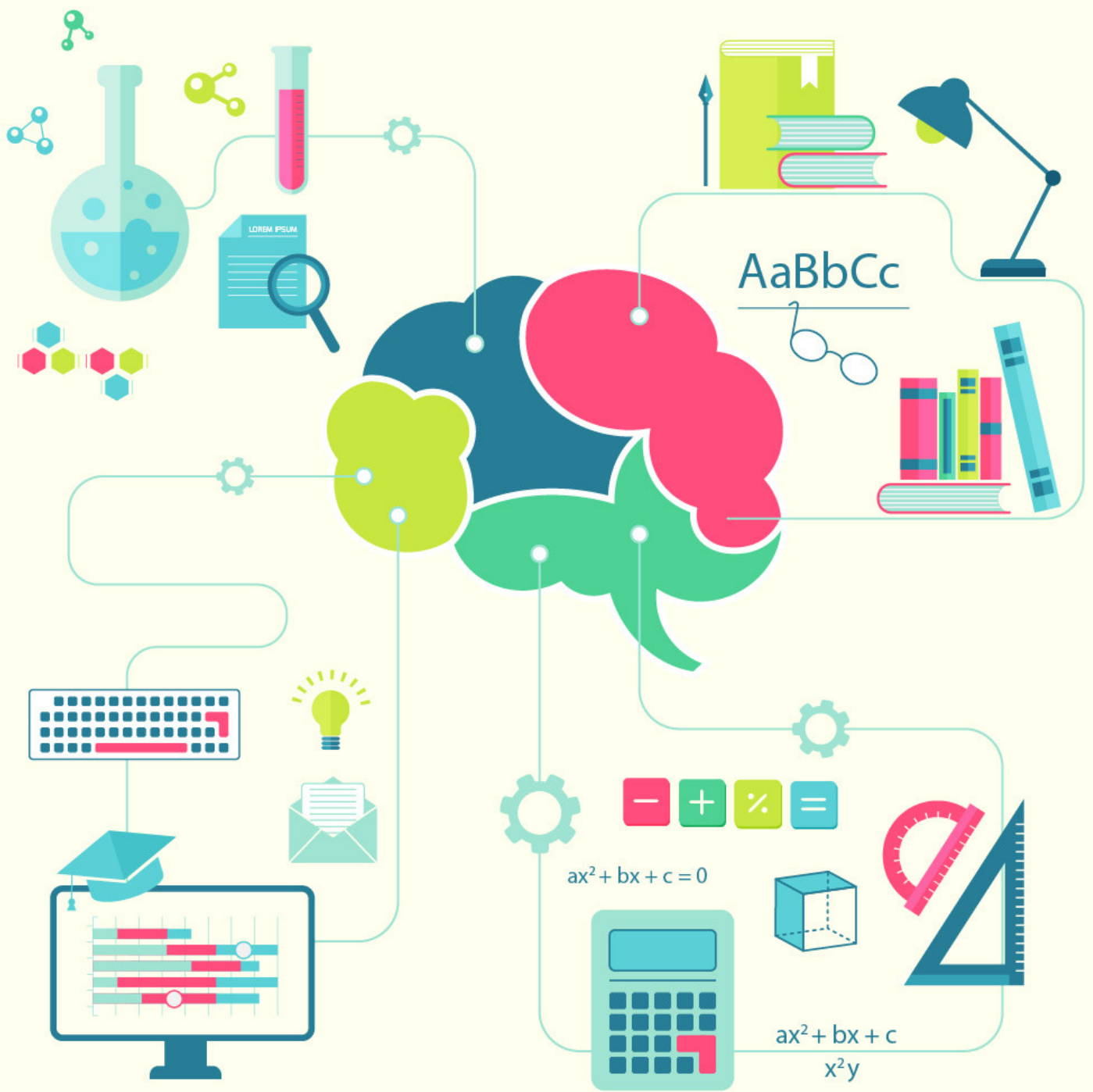


Mixtures And Alligations CAT Questions PDF Set-3





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Question 1: Ramu is a crooked milkman who mixes water in the milk. He keeps two cans of the mixture with him, one for his premium customers which contains 85% milk and the other for the regular customers which has 70% milk.

It is known that the ratio of the number of premium customers and regular customers is 17: 12. If he sells the milk 10% above the cost price to premium customers and 5% above the cost price to regular customers, then find his overall profit percentage (Each customer buys equal quantity of milk and assume the water to be free)

- a) 33%
- b) 41%
- c) 47%
- d) 37%

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Question 2: A farmer mixes 25ml of water for every 75ml of pure milk and sells it to a tea-seller. The tea seller sells tea containing milk which has 50% water and the rest pure milk. What percentage of the mixture the tea seller receives from the farmer is replaced with water?

- a) 66.67%
- b) 50%
- c) 33.33%
- d) 25%

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Question 3: 30 liters of mixture from a tank containing milk and water in the ratio 8:7 is removed and replaced by 30 liters of water. Again 30 liters of the mixture thus formed is removed and 30 liters of water is added. This process is repeated once again, what is the volume of the milk in the solution thus formed, if it is known that the initial volume of the mixture in the tank is 120 liters?

- a) 32 liters
- b) 27 liters
- c) 24 liters
- d) 48 liters

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Question 4: A vessel A contains diesel and kerosene in the ratio 2:3. Another vessel B contains diesel and kerosene in the ratio of 4:7. Both A and B are filled to the brim. Both the vessels are emptied into a third vessel C. What is the ratio of kerosene and diesel in vessel C?

- a) 11:17
- b) 17:11
- c) 9:13
- d) cannot be determined

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Question 5: Two varieties of rice R1 and R2 cost Rs. 20 and Rs. 50 per kg. In what ratio must R1 and R2 be mixed such that the cost price of the resultant rice is Rs. 45 per kg?

- a) 1:4
- b) 3:8
- c) 2:7
- d) 1:3
- e) 1:5

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Question 6: 3 identical containers are completely filled with water-milk mixtures with water and milk in the ratio 2 : 3, 3 : 4 and 4 : 5 respectively. All these mixtures are poured into a bigger container. What fraction of the mixture in the bigger container should be replaced by water so that the resulting mixture has equal quantities of water and milk?

- a) $\frac{34}{563}$
- b) $\frac{156}{683}$
- c) $\frac{237}{576}$
- d) $\frac{143}{1088}$

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Question 7: There are two alloys, A and B, which are made up of iron and copper. A contains iron and copper in the ratio 3:5 while B contains copper and iron in the ratio of 3:7. In what ratio should the alloys be mixed so that the resultant alloy has 50% iron? (All ratios to be taken by weight)

- a) 3:5
- b) 5:3
- c) 8:5
- d) None of these

CAT Questions on Factorial PDF

Question 8: Lokesh bought Grapes, Milk and Sugar in the ratio of 8:5:3. Further, he knows that grapes are 60% water and milk is 80% water. He put everything together and cooked the mixture for 2 hours during which 25% of the water in the dish got evaporated. What is the ratio of dry grapes to water in the cooked dish? (All ratios and percentages are to be taken by weight)

- a) 1:2
- b) 12:23
- c) 16:33
- d) None of these

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Answers & Solutions:

1) Answer (D)

Let the cost of 1 litre milk be y . So cost price of milk that he sells to premium customers is $.85y$ and the cost price of milk that he sells to regular customers is $.7y$. He sells the mixture at 10% profit to premium customers, so the selling price for premium customers = $1.1y$ and that for regular customers is $1.05y$

Thus the profit from regular customers = $(1.1y - .85y) = .25y$

Similarly, the profit from regular customers = $.35y$

Now we know that the number of premium customers and regular customers are in the ratio 17:12, So the overall profit would be

$$.25*17y + .35*12y$$

$$\text{Overall cost price} = .85y*17 + .70y*12$$

$$\text{Profit percentage} = (.25*17y + .35*12y)*100/((.85y*17+.70y*12)) = \frac{4.25y+4.2y}{14.45y+8.4y} \times 100$$

$$\Rightarrow \frac{8.45y}{22.85y} \times 100 = 36.97\% \sim 37\%$$

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2) Answer (C)

The mixture the farmer sells to the tea seller has 75% pure milk and 25% water i.e. every 100 ml of the mixture has 75 ml milk.

The final mixture the tea seller sells has 50% pure milk i.e. every 100ml of the mixture has 50 ml of milk.

Therefore, 25 ml of pure milk for every 100 ml of the mixture has been replaced by the tea-seller.

Thus, the ratio of the mixture replaced = volume of milk replaced per 100ml/total volume of milk per 100ml =

$$= \frac{25}{75} \times 100\% = 33.33\%$$

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3) Answer (B)

Initial volume of the milk = $(120/15)*8 = 64$ liters

Final volume of the milk = $64 * (1 - \frac{30}{120})^3 = 27$ liters

4) Answer (D)

We have not been given anything about the ratio of volumes of vessel A and B. Hence we cannot determine the ratio of kerosene and oil in vessel C.

Note: Allegation rule can only be applied when volume of both the quantities are initially same.

5) Answer (E)

Using Alligation we get,

20	50
\ /	
45	
/ \	
5	25

Thus the ratio is 5:25 or 1:5.

CAT Percentile vs IIM Calls Calculator

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6) Answer (D)

The LCM of 5, 7 and 9 is 315.

So let the volume of each container be 315 units.

Hence, the volume of water in three containers is 126, 135 and 140 units respectively and that of milk is 189, 180 and 175 units respectively.

The ratio of water and milk in the bigger container = 401 : 544

Let the volume of the mixture that needs to be replaced by water be 'x' units.

Units of Water = Units of Milk

$$\Rightarrow 401 - 401 \times \frac{x}{945} + x = 544 - 544 \times \frac{x}{945}$$

$$\Rightarrow x = \frac{143 \times 945}{1088}$$

Thus the fraction of mixture to be replaced by water is $\frac{143}{1088}$

7) Answer (C)

Redict your IIM Calls

Let us assume that we take 8k of A and 10n of B.

Since iron in the resultant alloy is 50%, we can infer that copper will also be 50%.

Total iron in the resultant alloy = 3k+7n, total copper = 5k+3n

Now, 3k+7n=5k+3n $\Rightarrow 2n=k$.

Now, ratio of A and B = $\frac{8k}{10m} = 8:5$

8) Answer (C)

Let the quantities of grapes, milk, and sugar he bought be 8k, 5k, and 3k respectively.

In 8k grapes- 60% is water and 40% is dry grapes i.e. 0.6 X 8k water and 0.4 X 8k dry grapes

In 5k milk, 80% is water i.e. 4k is water.

Total water in the mixture = 4.8k+4k=8.8k

Total dry grapes = 3.2k

Now after cooking only 75% of water remained.

\Rightarrow water remaining = $\frac{3}{4} \times 8.8k = 6.6k$

So, the required ratio = 3.2k/6.6k=16/33.

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