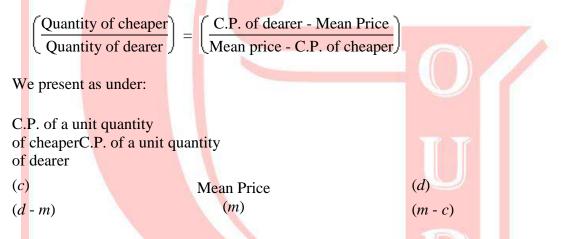## MIXTURE

INTRODUCTION

1. **Alligation:**

   It is the rule that enables us to find the ratio in which two or more ingredients at the given price must be mixed to produce a mixture of desired price.

2. **Mean Price:**

   The cost of a unit quantity of the mixture is called the mean price.

3. **Rule of Alligation:**

   If two ingredients are mixed, then

   $$\left(\frac{\text{Quantity of cheaper}}{\text{Quantity of dearer}}\right) = \left(\frac{\text{C.P. of dearer - Mean Price}}{\text{Mean price - C.P. of cheaper}}\right)$$

   We present as under:

   C.P. of a unit quantity
   of cheaperC.P. of a unit quantity
   of dearer

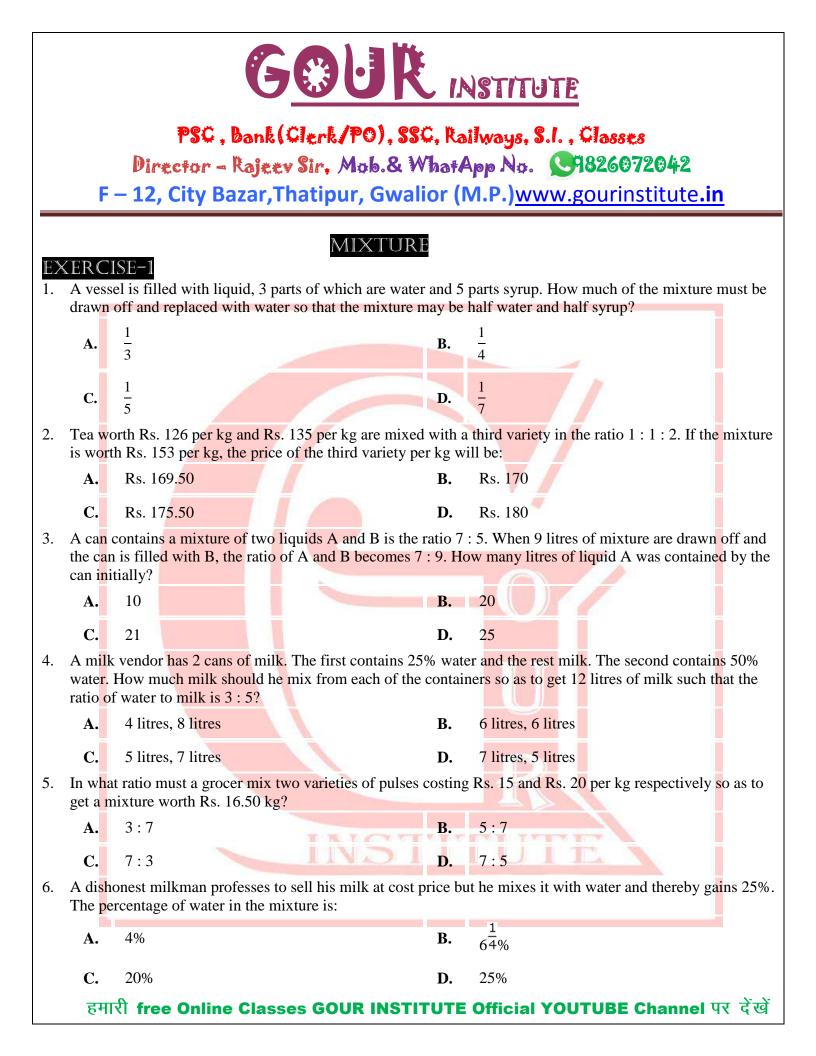 | (c) | Mean Price | (d) |
   |-----|-----------|-----|
   | (d - m) | (m) | (m - c) |

   ∴ (Cheaper quantity) : (Dearer quantity) = (d - m) : (m - c).
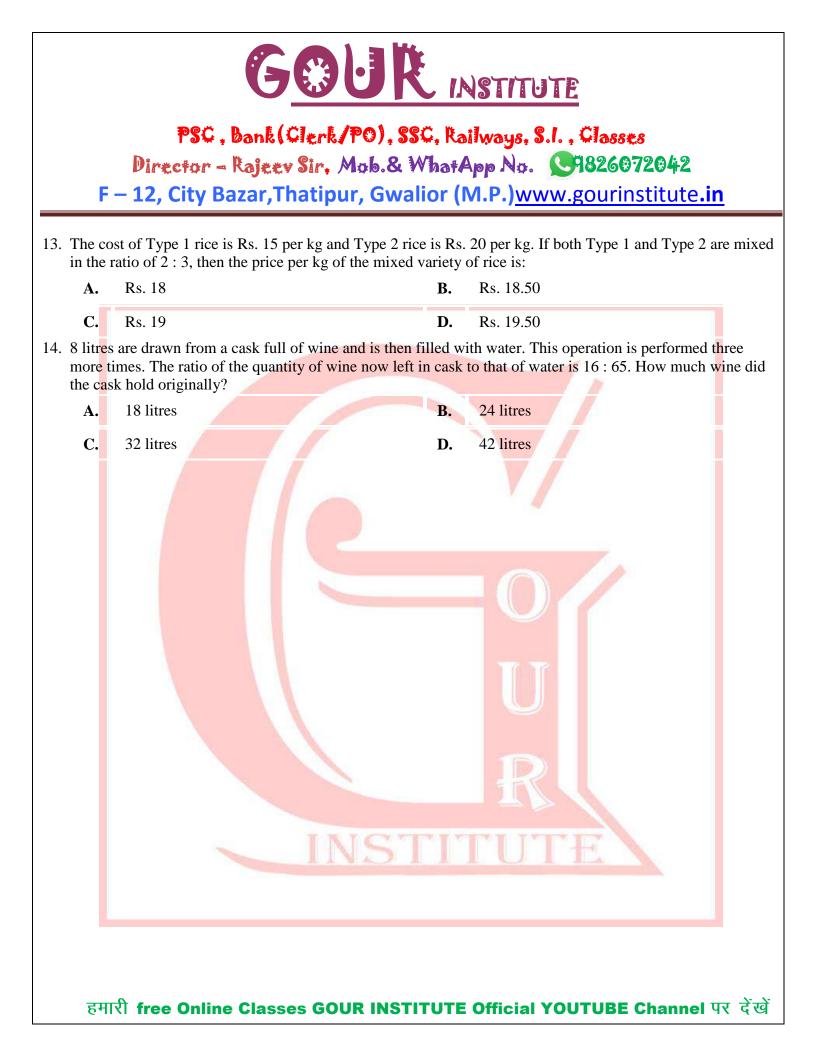
4. Suppose a container contains x of liquid from which y units are taken out and replaced by water.

   After n operations, the quantity of pure liquid = $\left[x\left(1 - \dfrac{y}{x}\right)^n \right]$ units.

MIXTURE

EXERCISE-1

1. A vessel is filled with liquid, 3 parts of which are water and 5 parts syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup?

   A. $\dfrac{1}{3}$

   B. $\dfrac{1}{4}$

   C. $\dfrac{1}{5}$

   D. $\dfrac{1}{7}$

2. Tea worth Rs. 126 per kg and Rs. 135 per kg are mixed with a third variety in the ratio 1 : 1 : 2. If the mixture is worth Rs. 153 per kg, the price of the third variety per kg will be:

   A. Rs. 169.50

   B. Rs. 170

   C. Rs. 175.50

   D. Rs. 180

3. A can contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7 : 9. How many litres of liquid A was contained by the can initially?

   A. 10

   B. 20

   C. 21

   D. 25

4. A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5?

   A. 4 litres, 8 litres

   B. 6 litres, 6 litres

   C. 5 litres, 7 litres

   D. 7 litres, 5 litres

5. In what ratio must a grocer mix two varieties of pulses costing Rs. 15 and Rs. 20 per kg respectively so as to get a mixture worth Rs. 16.50 kg?

   A. 3 : 7

   B. 5 : 7

   C. 7 : 3

   D. 7 : 5

6. A dishonest milkman professes to sell his milk at cost price but he mixes it with water and thereby gains 25%. The percentage of water in the mixture is:

   A. 4%

   B. $6\dfrac{1}{4}\%$

   C. 20%

   D. 25%

7. How many kilogram of sugar costing Rs. 9 per kg must be mixed with 27 kg of sugar costing Rs. 7 per kg so that there may be a gain of 10% by selling the mixture at Rs. 9.24 per kg?

    A. 36 kg   **B.** 42 kg

    C. 54 kg   **D.** 63 kg

8. A container contains 40 litres of milk. From this container 4 litres of milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?

    A. 26.34 litres   **B.** 27.36 litres

    C. 28 litres   **D.** 29.16 litres

9. A jar full of whisky contains 40% alcohol. A part of this whisky is replaced by another containing 19% alcohol and now the percentage of alcohol was found to be 26%. The quantity of whisky replaced is:

    A. $\dfrac{1}{3}$ **B.** $\dfrac{2}{3}$

    C. $\dfrac{2}{5}$ **D.** $\dfrac{3}{5}$

10. In what ratio must water be mixed with milk to gain $16\dfrac{2}{3}\%$ on selling the mixture at cost price?

    A. 1 : 6   **B.** 6 : 1

    C. 2 : 3   **D.** 4 : 3

11. Find the ratio in which rice at Rs. 7.20 a kg be mixed with rice at Rs. 5.70 a kg to produce a mixture worth Rs. 6.30 a kg.

    A. 1 : 3   **B.** 2 : 3

    C. 3 : 4   **D.** 4 : 5

12. In what ratio must a grocer mix two varieties of tea worth Rs. 60 a kg and Rs. 65 a kg so that by selling the mixture at Rs. 68.20 a kg he may gain 10%?

    A. 3 : 2   **B.** 3 : 4

    C. 3 : 5   **D.** 4 : 5

GOUR INSTITUTE

PSC , Bank(Clerk/PO) , SSC, Railways, S.I. , Classes
Director – Rajeev Sir, Mob.& WhatApp No. 9826072042
F – 12, City Bazar,Thatipur, Gwalior (M.P.)www.gourinstitute.in

13. The cost of Type 1 rice is Rs. 15 per kg and Type 2 rice is Rs. 20 per kg. If both Type 1 and Type 2 are mixed in the ratio of 2 : 3, then the price per kg of the mixed variety of rice is:

   A.   Rs. 18   B.   Rs. 18.50

   C.   Rs. 19   D.   Rs. 19.50

14. 8 litres are drawn from a cask full of wine and is then filled with water. This operation is performed three more times. The ratio of the quantity of wine now left in cask to that of water is 16 : 65. How much wine did the cask hold originally?

   A.   18 litres   B.   24 litres

   C.   32 litres   D.   42 litres

ANSWER SHEET

MIXTURE EXERCISE

1	2	3	4	5	6	7	8	9	10	11	12	13	14
C	C	C	B	C	C	D	D	B	A	B	A	A	B