Average Mixture & Allegation:

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.

Mean Price:

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

Rule of Alligation:

If two ingredients are mixed, then

Quantity of cheaper	=	C.P.of dearer – Mean Price
Quantity of dearer		Mean price – C.P.of cheaper

We present as under:





Questions:

Average price of goods:-

- Q1. 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?
- Q2. Tea worth Rs. 126 per kg and Rs. 135 per kg is mixed with a third variety in the ratio 1: 1: 2. If the mixture is worth Rs. 153 per kg, what was the the price of the third variety per kg?
- Q3. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. What was the quantity sold at 18% profit?

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

Q4. 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?

Average Speed

- **Q5.** A car travels at 20kmph for 30 minutes and at 10 kmph for 45 minutes. Find the average speed of the car for entire journey.
- **Q6.** Amit covers 200 km in 10 hours. The first part of journey is travelled by bus at the speed of 15 km/hr and second part by a car at the speed of 25 km/hr.

What is the ratio of distances covered by bus and car?

Application in compound mixture

- Q7. Vessel A contains milk and water in the ratio 4:5. Vessel B contains milk and water in the proportion 5:1.In what proportion should quantities be taken from A & B to form a mixture in which milk and water are in the ratio 5:4?
- Q8. A container has 50 litres of milk in it. 5 litres of milk is taken out and is replaced by 5 litres of water. This process is repeated 4 more times. What is the amount of milk in the container after final replacement?
- Q9. In what ratio must water be mixed with milk to gain $\frac{2}{2}$

 $16\overline{3}\%$ on selling the mixture at cost price?

- Q10. 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?
- Q11. 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%. What is the quantity of whisky replaced?
- Q12. A container contains 30 liters of milk. From this container, 3 liters of milk were taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?
- **Q13.** A container contains a mixture of two liquids P and Q in the ratio of 7:5. When 9 liters of mixture is taken out and replaced with Q, the ratio becomes 7:9. Find the quantity of liquid P in the container.
- Q14. From the 40 litres solution of pure milk, 5 litres of milk is replaced with equal quality of water. Again 5 litres of the mixture is substituted with 5 litres of water. This operation is repeated one more time. Find the volume of milk in the final solution.
- Q15. From the 40 litres solution of pure milk, 5 litres of milk is replaced with 6 litres of water. Next time, 6 litres of the mixture is replaced with 7 litres of water. Find the volume of milk in the final solution.