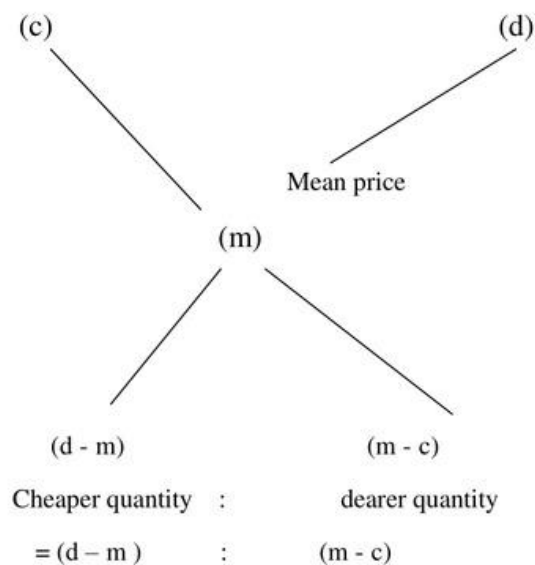


ALLIGATION

Rule of allegation – If two different things, one of which is cheaper than the other, are mixed in a certain ratio to obtain a new mixture, the C.P. of the unit value of this new mixture is called the average price or mean price.

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

⇒ C.P. of unit quantity of cheaper C.P. of unit quantity of dearer



Some other Important Formulae

1- In what ratio should two commodities of Rs. A per kg and Rs. B per kg respectively be mixed so that the resulting mixture may cost Rs. C per kg ?

$$\begin{aligned} \text{Reqd. ratio} &= \frac{C \sim B}{C \sim A} \\ &= \frac{\text{Mean Price} \sim \text{Second Price}}{\text{Mean Price} \sim \text{First Price}} \end{aligned}$$

Example – A tea merchant blends two types of tea costing Rs. 15 per kg and Rs. 20 per kg each respectively. In what ratio should these two types of tea be mixed so that the resulting mixture may cost Rs. 16.50 per kg ?

Example – In what ratio should water be mixed in the spirit so that there is a gain of $16\frac{2}{3}\%$ when the resulting mixture is sold at the C.P. of the spirit only ?

Some Unsolved Examples

Example 1 – 21 litre of a mixture of 95 % purity is obtained when two solutions are mixed. If the purity of one solution be 90 % and of the purity of other be 97 %, then how much solution of purity 97 % is taken ?

Example 2 – 9 litre are drawn from a cask full of water and it is then filled with milk. 9 litre of mixture are drawn and the cask is again filled with milk. The quantity of water now left in the cask is to that of the milk in it as 16 : 9. How much mixture does the cask hold ?

Example 3 – A mixture of 20 kg of spirit and water contains 10 % of water. How much water must be added to make 25 % of the resulting mixture ?

Example 4 – A trader had 100 kg of Sugar. Some part of it he sold at 7 % of profit and the rest at 17 % of profit. If he got 10 % of profit in all, then how much did he sell at 17 % of profit ?

Example 5 – In 60 litre of adulterated milk the ratio of milk and water is 2 : 1. How much water should be added in it so that the ratio of milk and water be 1 : 2.

EXERCISE

1. A trader bought 50 kg of wheat of Rs. 7 per kg. and 20 kg. of wheat at Rs. 8 per kg. He mixed the two and sold the mixture at Rs. 10 per kg What is his profit ?
(a) Rs. 510 (b) Rs. 700
(c) Rs. 190 (d) Rs. 290
(e) None of these
2. Alok bought 30 kg of rice at Rs. 8.50 per kg and 20 kg of rice at Rs. 8.00 per kg. If he has to make a 20 % profit, at approximately what rate per kg should he sell the rice ?
(a) Rs. 9.00 (b) Rs. 12.00
(c) Rs. 8.50 (d) Rs. 8.00
(e) None of these
3. A trader bought 20 kg of wheat of Rs. 6.50 per kg and 30 kg of wheat at Rs. 7 per kg. He sold the mixture at a profit of Rs. 60. At what price did he sell per kg of the mixture of wheat ?
(a) Rs. 6.80 (b) Rs. 7.00
(c) Rs. 8.00 (d) Rs. 60.00
(e) None of these
4. How much water should be added to 175 litre of milk at Rs. 8.00 per litre so as to have a mixture worth Rs. 7.00 per litre ?
(a) 27 litre (b) 35 litre
(c) 25 litre (d) 24 litre
(e) None of these
5. How much wheat at Rs. 4.00 a kg should be mixed with 42 kg of wheat at Rs. 6.00 a kg so as to have a mixture worth Rs. 4.80 a kg ?

- (a) 63 kg (b) 53 kg
(c) 52 kg (d) 60 kg
(e) None of these
6. Two alloys of gold and copper are prepared by mixing in the ratio of 7 : 2 and 7 : 11. A third alloy is made after mixing the equal quantities of two alloys. The ratio of gold and copper in third alloy is :
- (a) 7 : 12 (b) 14 : 13
(c) 7 : 5 (d) 2 : 11
(e) None of these
7. A man buys milk at a certain price and after mixing it with water sells it again at the same price. How many ml of water he mixes in a litre of milk if he makes a profit of 20 % ?
- (a) 200 ml (b) 250 ml
(c) 150 ml (d) 20 ml
(e) None of these
8. A mixture of 40 litres of milk and water contains 10 % of water. How much water must be added to make the water 20 % of the resulting mixture ?
- (a) 10 litre (b) 7 litre
(c) 5 litre (d) 3 litre
(e) None of these
9. Pure ghee costs Rs. 100 per kg. After adulterating it with vegetable oil costing Rs. 50 per kg, a shopkeeper sells the mixture at Rs. 96 per kg, thereby making a profit of 20 %. In what ratio does he mix the two ?
- (a) 1 : 2 (b) 3 : 2
(c) 3 : 1 (d) 2 : 3
(e) None of these

(a) Rs. 23 (b) Rs. 24
(c) Rs. 25 (d) Rs. 26
(e) None of these

10. b

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