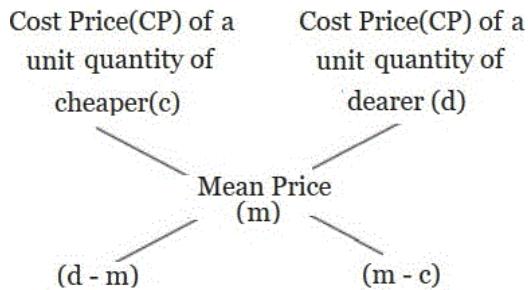


## 24. MIXTURES AND ALLEGATIONS



- Rule of Allegation can be written as 
$$\frac{\text{Quantity of Cheaper}}{\text{Quantity of Dearer}} = \frac{\text{Rate of Dearer} - \text{Average Rate}}{\text{Average Rate} - \text{Rate of Cheaper}}$$

**Directions for questions 1 to 40:** Select the correct alternative from the given choices.

- A vessel contains 35 litres of a mixture of milk and water containing 60% milk. 5 litres of pure milk is added to it. Find the percentage of milk in the new mixture.  
(1) 50% (2) 55% (3) 68% (4) 65%
- A vessel contains 25 litres of a mixture of milk and water containing 40% milk. Find the quantity (in litres) of pure milk to be added to the vessel so that the quantity of milk and water in the vessel becomes equal.  
(1) 2.5 (2) 5 (3) 7.5 (4) 10
- A milkman has 30 litres of pure milk. Find the quantity (in litres) of water to be added to it so that he gets 60% profit by selling it at its cost price.  
(1) 12 (2) 18 (3) 15 (4) 20
- A vessel contains 10 litres of pure milk. 1 litre of milk is taken out and replaced by an equal amount of water. 1 litre of mixture is then taken out and replaced by an equal amount of water. Find the final quantity of milk (in litres).  
(1) 9 (2) 8.1 (3) 7.29 (4) None of these
- A total of 57 pens were distributed among 10 children such that each girl gets 5 pens and each boy gets 6 pens. Find the number of girls.  
(1) 6 (2) 5 (3) 4 (4) 3
- A)** If two kinds of grapes which cost Rs.22 a kg and Rs.27 a kg are mixed in the ratio of 3 : 2, then find the cost of the mixture per kg.  
(1) 24.50 (2) 23 (3) 24 (4) 25  
  
**B)** 6 kg of wheat costing Rs.10 per kg is added to 9 kg of wheat costing Rs.15 per kg. At what price (in Rs.) should this mixture be sold so that there is no loss or gain?  
(1) 11 (2) 12 (3) 13 (4) 14

- How many litres of water should be added to 25 litres of milk costing Rs.12 per litre, so that by selling the mixture at the cost price, profit of 20% is made?  
(1) 2 litres (2) 5 litres (3) 8 litres (4) 10 litres
- Two varieties of rice are mixed in the ratio 2 : 5 and the mixture sold at Rs.12 at a profit of 20%. If the first variety costs Rs.7 more than the second variety, find the cost of the first variety.  
(1) Rs.7 (2) Rs.15 (3) Rs.16 (4) None of these
- Two vessels contain water and alcohol in the ratio 1 : 2 and 3 : 4. The two solutions are then mixed by taking 6 litres from the first vessel and 35 litres from the second. Find the ratio of alcohol to water in the resulting solution.  
(1) 15 : 22 (2) 22 : 15 (3) 24 : 17 (4) 17 : 24
- Fresh grapes contain 84% water while raisins contain 20% water. How many kg of raisin can be made from 80 kg of grapes?  
(1) 16 kg (2) 18 kg (3) 20 kg (4) 22 kg
- Two containers contain petrol and diesel in the ratio 4 : 3 and 3 : 1. How many litres from the first container should be mixed with 16 litres from the second so that the new ratio becomes 32 : 19?  
(1) 35 litres (2) 40 litres (3) 50 litres (4) None of these
- A milkman dilutes 36 litres of pure milk with water. The percentage of milk in the solution is now 75%. How many litres of water did he add?  
(1) 4 litres (2) 6 litres (3) 9 litres (4) 12 litres
- How many litres of water should a milkman add to 35 litres of milk costing Rs.560, so that by selling the milk at Rs.14 per litre, he recovers his cost?  
(1) 2 litres (2) 5 litres (3) 7 litres (4) 10 litres
- Two vessels have petrol, diesel and kerosene mixed in the ratio 1 : 2 : 4 and 3 : 5 : 6. If the quantities in the two vessels are mixed in the ratio 1 : 1, what is the

ratio of petrol, diesel and kerosene in the resultant mixture?

- (1) 5 : 9 : 14      (2) 3 : 6 : 8  
(3) 4 : 8 : 11      (4) 4 : 7 : 10

15. Vessel P contains 5 litres of milk and vessel Q contains 5 litres of water. One litre of milk is taken from P and is poured into Q. One litre of the mixture in Q is then poured into P. If the present quantities of milk in Q and water in P are  $V_M$  and  $V_W$  respectively, then which of the following holds true?

- (1)  $V_M > V_W$       (2)  $V_M = V_W$   
(3)  $V_M < V_W$       (4) Cannot be determined

16. A milkman bought 10 litres of pure milk at Rs.10/litre and 10 litres of adulterated milk at Rs.6/litre. He mixed both and sold the mixture at Rs.10 / litre. Find his profit percentage.

- (1) 20%      (2) 15%      (3) 25%      (4) 30%

17. There are two containers with mixtures of Pepsi and Coke. In container 1, they are in the ratio of 3 : 2 and in container 2 they are in the ratio of 2 : 3. How many litres of the mixture should be taken from container 1 and mixed with an appropriate quantity of the mixture from container 2 in order to make 20 litres of a mixture containing Pepsi and Coke in the ratio 9 : 11?

- (1) 10      (2) 15      (3) 20      (4) 5

18. A shopkeeper mixes three varieties of rice costing Rs.10, Rs.12 and Rs.17 per kg. Which of the following represents the ratio in which the three varieties are mixed, if the trader makes a profit of 20% by selling the mixture at Rs.15.60 per kg?

- (1) 9 : 14 : 36      (2) 11 : 14 : 25  
(3) 14 : 36 : 43      (4) 2 : 6 : 3

19. In fresh grapes, 80% of the weight is water while in dry grapes only 50% of the weight is water. How many kgs of dry grapes can be obtained from 20 kg of fresh grapes?

- (1) 3 kg      (2) 12 kg      (3) 1 kg      (4) 8 kg

20. In what ratio should a shopkeeper mix tea costing Rs.120 per kg and Rs.180 per kg so that by selling it at Rs.205 per kg, he earns a profit of 25%?

- (1) 2 : 5      (2) 3 : 7      (3) 3 : 8      (4) 4 : 11

21. Two vessels contain petrol and kerosene in the ratio 2 : 5 and 4 : 3. In what ratio should the solutions in the first vessel be mixed with the solutions in the second, so as to get a solution with petrol and kerosene in the ratio 3 : 4?

- (1) 1 : 1      (2) 1 : 2      (3) 2 : 5      (4) 3 : 5

22. A gold ornament weighing 720g contains 90% of pure gold and the rest silver. How much silver (in grams) must be added so that the resulting mixture contains 19% silver?

- (1) 50      (2) 80      (3) 60      (4) 90

23. 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?

- (1) 1/6      (2) 1/5      (3) 2/5      (4) 3/5

24. 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:

- (1) Rs 175.5      (2) Rs 180.0  
(3) Rs 159.5      (4) Rs 170.0

25. 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?

- (1) 10      (2) 20      (3) 21      (4) 25

26. 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?

- (1) 4 litres, 8 litres      (2) 6 litres, 6 litres  
(3) 5 litres, 7 litres      (4) 7 litres, 5 litres

27. 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?

- (1) 3:7      (2) 5:7      (3) 7:3      (4) 7:5

28. 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:

- (1) 4%      (2) 6 1/4%      (3) 20%      (4) 25%

29. 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?

- (1) 36 kg      (2) 42 kg      (3) 54 kg      (4) 63 kg

30. 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?

- (1) 26.34 litres      (3) 27.36 litres  
(3) 28 litres      (4) 29.16 litres

31. 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:

- (1) 1/3      (2) 2/3      (3) 2/5      (4) 3/5  
(5) None of these

32. In what ratio must water be mixed with milk to gain 16% on selling the mixture at cost price?

- (1) 1:6      (2) 4:25      (3) 2:3      (4) 4:3

33. A bottle contains 20 litres of liquid Q. 4 litres of liquid A is taken out of its and replace by same quantity of liquid B. Again 4 litres of the mixture is taken out and replaced by same quantity of liquid B. What is the ratio of quantity of liquid A to that of liquid B in the final mixture?

- (1) 4:1      (2) 5:1      (3) 16:9      (4) 17:8

34. Two equal glasses of same type are respectively 1/3 and 1/4 full of milk. They are then filled up with water and the contents are mixed in a pot. What is the ratio of milk and water in the pot?

- (1) 9:21      (2) 11:23      (3) 7:17      (4) 1:3

- 35.** 30g of sugar was mixed in 180 ml water in a vessel A, 40 g of sugar was mixed in 280 ml of water in vessel B and 20 g of sugar was mixed in 100 ml of water in vessel C. The solution in vessel B is  
 (1) sweeter than that in C  
 (2) sweeter than that in A  
 (3) as sweet as that in C  
 (4) less sweet than that in C
- 36.** There is a milk sample with 50% water in it. If  $\frac{1}{3}$  of this sample is added to equal amount pure milk, then water in the new mixture will fall down to.  
 (1) 25%    (2) 30%    (3) 35%    (4) 40%
- 37.** 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%?  
 (1) 3:2    (2) 3:4    (3) 3:5    (4) 4:5
- 38.** Two vessels A and B contain spirit and water mixed in the ratio 5: 2 and 7: 6 respectively. Find the ratio in which this mixture be mixed to obtain a new mixture in vessel C containing spirit and water in the ration 8: 5?  
 (1) 4:3    (2) 3:4    (3) 5:6    (4) 7:9
- 39.** The cost of Type I 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 2: 3, then the price per kg of the mixed variety of rice is: Rs  
 (1) 18    (2) 18.50    (3) 19    (4) 19.50  
 (5) None of these
- 40.** In a pot, there is a mixture of milk and water in the ratio 4 : 5. If it is filled with an additional 8 litres of milk, the pot would be full and ratio of milk and water would become 6 : 5. Find the capacity of the pot ?
- (1) 11 litres    (2) 44 litres  
 (3) 33 litres    (4) 22 liters
- 41.** Priti possessing ₹ 10,000, lent a part of it at 5% simple interest and the remaining at 20% simple interest. Her total income after 5 years was ₹7500. Find the sum lent at 20% rate.  
 (1) ₹2000    (2) ₹4000    (3) ₹3000  
 (4) None of these
- 42.** In what ratio should water be mixed with soda costing ₹12 per litre so as to make a profit of 50% by selling the diluted liquid at ₹15 per litre?  
 (1) 10:1    (2) 5:1    (3) 1:5    (4) 6:1
- 43.** How much pure alcohol must be added to 400 ml of a solution containing 16% of alcohol to change the concentration of alcohol in the mixture to 40%  
 (1) 160 ml    (2) 100 ml  
 (3) 128 ml    (4) 68 ml
- 44.** Wheat costing Rs. 30/kg, Rs. 35/kg and a third variety of wheat are mixed in the ratio of 3 : 4 : 2. If the mixture costs Rs. 34/kg, then what will be the cost (in Rs./kg) of the third variety of wheat?  
 (1) 46    (2) 42    (3) 32    (4) 38
- 45.** The ratio of Iron and Zinc in an alloy is 4 : 5. In another alloy, the ratio of Iron, Copper and Zinc is 3 : 2 : 7. Equal amounts of the two alloys are molten and mixed together. What will be the ratio of Iron, Copper and Zinc in the resultant alloy?  
 (1) 6 : 25 : 41    (2) 25 : 41 : 6  
 (3) 25 : 6 : 41    (4) 4 : 5 : 7

Mixtures & Allegations																	
1	4	6	3,3	11	1	16	3	21	1	26	2	31	2	36	1	41	2
2	2	7	2	12	4	17	4	22	3	27	3	32	2	37	1	42	3
3	2	8	2	13	2	18	4	23	2	28	3	33	3	38	4	43	1
4	2	9	3	14	1	19	4	24	1	29	2	34	3	39	1	44	4
5	4	10	1	15	2	20	4	25	3	30	4	35	3	40	2	45	3