Alligation and Mixture

Model 1: Simple Mixtures

1. How much of salt at 42 paise/kg must be mixed with 25 kg of salt at 24 paise/kg, so that a profit of 25% is obtained by selling the mixture at 40 paise/kg?

   1) 25 kg 2) 20 kg 3) 30 kg 4) 24 kg 5) None of these

2. A merchant has 840 kg of rice, part of which he sells at 9% profit and the rest at 16% profit. He gains 12% profit on the whole. What is the quantity sold at 16% profit?

   1) 480 kg 2) 240 kg 3) 360 kg 4) 600 kg 5) None of these

3. A trader has 4000 kg of tea, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. What quantity of tea was sold at 8% profit?

   1) 480 kg 2) 200 kg 3) 2400 kg 4) 1600 kg 5) None of these

4. In what ratio should tea at 35 per kg be mixed with tea at 27 per kg so that mixture may cost ₹ 30 per kg?

   1) 7:2 2) 2:7 3) 3:5 4) 5:3 5) 7:9

Model 2: Compound Mixtures

5. An alloy of zinc and tin contains 35% of zinc by weight. What quantity of zinc must be added to 400 lb of this alloy such that there is 60% of zinc by weight in the final mixture?

   1) 400 lb 2) 350 lb 3) 250 lb 4) 380 lb 5) None of these

6. Two vessels A and B contain mixtures of milk and water. The ratio of milk and water in these two vessels is 5:2 and 8:5 respectively. In what ratio must these mixtures be mixed to form a new mixture containing milk and water in 9:4 ratios?

   1) 7:2 2) 2:7 3) 3:5 4) 5:3 5) 7:9

7. A can contain a mixture of two liquids A and B in the ratio 7:5. When 9 litres of the mixture is drawn off and replaced with liquid B, the ratio of A and B becomes 7:9. What was the initial quantity (in litres) of liquid A in the can?

   1) 15 2) 28 3) 6.5 4) 21 5) None of these

8. Two vessels A and B contain milk and water mixed in the ratio 4: 3 and 2: 3. In what ratio must these mixtures be mixed to form a new mixture containing half milk and half water?

   1) 7: 5 2) 1: 2 3) 2: 1 4) 6: 5 5) None of these

9. A mixture of 40 litres of milk & water contains 10% water. How much water should be added to this so that water must be 20% in the new mixture?

   1) 5 litres 2) 4 litres 3) 6.5 litres 4) 7.5 litres 5) None of these

10. 729 ml of the mixture contains milk and water in the ratio 7:2. How much more water is to be added to get a new mixture containing milk and water in the ratio 7:3?

    1) 79 ml 2) 81 ml 3) 72 ml 4) 91 ml 5) None of these

11. An alloy of copper and lead contains 35% of copper by weight. If the final percentage of copper is to be 66.66, then what will be the weight of copper which must be added to 400 lb of this alloy?

    1) 400 lb 2) 350 lb 3) 280 lb 4) 380 lb 5) None of these

12. A milk vendor has 2 cans of milk. The first can contains 25% water and the second can 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 and 8 litres 2) 5 litres and 7 litres 3) 6 litres and 6 litres

    4) 7 litres and 5 litres 5) None of these

13. In what ratio should two different types of mixtures containing, milk and water in the ratio of 5:1 and 2:1 respectively mixed to obtain a final mixture containing milk and water in the ratio of 3:1?

    1) 7:5 2) 1:2 3) 2:1 4) 1:1 5) None of these

14. In two alloys, the ratio of zinc to tin is 5:2 and 3:4. If 7 kg of the first alloy and 21 kg of the second alloy are mixed together to form a new alloy, then what will be the ratio of zinc and tin in the new alloy?

    1) 2:1 2) 1:2 3) 1:1 4) 1:3 5) None of these

Model 3: Removal and Replacement

15. A container has 40 litres of wine. From this container, 4 litres of wine is taken out and replaced with water. This process is repeated two more times. What will be the final quantity of water (in litres) in the container?

    1) 12 2) 28 3) 29.16 4) 10.84 5) None of these

16. 6 gallons of wine are drawn from a cask and replaced by 6 gallons of water. 6 gallons of the mixture are drawn next and again replaced by 6 gallons of water. If the ratio of wine to water in the cask is now 81:19, then what was the quantity of wine (in gallons) in the cask at the beginning of the operation? (There was no water in the cask at first)

    1) 60 2) 18 3) 36 4) 24 5) None of these

Model 4: Miscellaneous

17. Deepak has some goats and some hens. If the total number of heads is 90 and the total number of feet is 248, what is the total number of goats?

    1) 34 2) 56 3) 48 4) 42 5) None of these

18. An amount of ₹ 780 is distributed among 60 students of a class, such that each boy gets ₹ 15 and each girl gets ₹ 10. Find the number of boys in the class?

1) 24 2) 36 3) 40 4) 20 5) None of these

19. A sum of ₹ 12000 is divided into two parts. One part is lent at the simple interest of 6% per annum and the other at 8% per annum. What is the sum lent at 8% pa if the total interest at the end of 1 year is ₹ 860?

1) ₹ 8000 2) ₹ 6000 3) ₹ 9000 4) ₹ 7000 5) None of these

20. A sum of ₹ 16800 is divided into two parts. One part is lent at the simple interest of 6% per annum and the other at 8% per annum. After 2 years total received is ₹ 19000. What is the sum lent at 6% of simple interest?

1) ₹ 12200 2) ₹ 12000 3) ₹ 11000 4) ₹ 10000 5) None of these

Answers

1 - 2	2 - 3	3 - 4	4 - 3	5 - 3	6 - 1	7 - 4	8 - 1	9 - 1	10 - 2
11 - 4	12 - 3	13 - 4	14 - 3	15 - 4	16 - 1	17 - 1	18 - 2	19 - 4	20 - 1

Additional Examples

1. Two equal vessels are filled with the mixtures of water and milk in the ratio of 3:4 and 5:3 respectively. If the mixtures are poured into a third vessel, the ratio of water and milk in the third vessel will be

   a) 15:12 b) 53:59 c) 20:9 d) 59:53

2. A trader has 40kg of tea, a part of which he sells at 12% profit and the rest at 8% loss. He gains 9% on the whole. What is the quantity sold at 12% gain and 8% loss?

   a) 30kg, 10 kg b) 32kg, 8kg c) 33kg, 7kg d) 34kg, 6kg

3. Gold is 19 times as heavy as water and copper 9 times as heavy as water. The ratio in which these two metals be mind, so that the mixture is 15 times as heavy as water, is

   a) 1:2 b) 2:3 c) 3:2 d) 19:135

4. The ratio of the volumes of water and glycerine in 240 cc of mixture is 1:3. The quantity of water (in cc) that should be added to the mixture so that the new ratio of the volumes of water and glycerine becomes 2:3 is

   a) 55 b) 60 c) 62.5 d) 64

5. 15L of a mixture contains alcohol and water in the ratio 1:4. If 3 L of water is mixed in it, the percentage of alcohol in the new mixture will be

   a) 15 b) $16\frac{2}{3}$ c) 17 d) $18\frac{1}{7}$

6. A container has 80 L of milk. From this container 8 L of milk was taken out and replaced by water. The process was further repeated twice. The Volume of milk in the container after that is

   a) 58.23L b) 85.23L c) 58.32L d) 85.32L

7. A can contains a mixture of two liquids A and B in the ratio 7:5. When 9L of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7:9. Liters of liquid A contained by the can initially was

   a) 10 b) 20 c) 21 d) 25

8. From a vessel containing 100 L of wine, 10 L are drawn out and an equal amount of water is added. From the mixture, 10L is again drawn out and same quantity of water is added. What is the final ratio of wine and water?

   a) 91:9 b) 81:19 c) 80:20 d) 90:10

9. A trader has 44kg of rice, a part of which he sells at 26% profit and the rest at 18% loss. On the whole his loss is 16%. What is the quantity sold at 26% profit and that at 18% loss?

   a) 2kg, 42kg b) 4kg, 40kg c) 42kg, 2kg d) 40kg, 4kg

Answers

1 – d	2 - d	3 - c	4 - b	5 - b	6 - c	7 - c	8 - b	9 - a