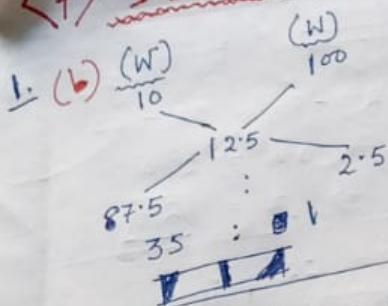


<7> MIXTURES AND ALLIGATION [ANSWER]



$$\therefore 35x = 70$$

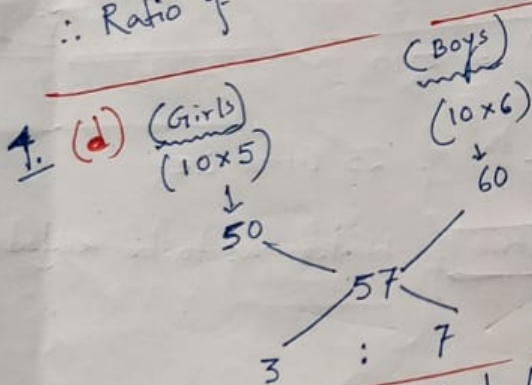
$$x = 2$$

2. (b) As the milkman wants to get 50% profit by selling it cost price; the milkman has to add water is equal to 50% of pure milk i.e; 50% of (20 litres) = 10 litres

3. (b) Let $P = 10$; $Q = 1$

~~Ratio of milk and water in the final mixture~~
Ratio of quantity of milk in the final mixture and to that of the final mixture = $\left(\frac{P-Q}{P}\right)^2 = \left(\frac{10-1}{10}\right)^2 = 81:100$

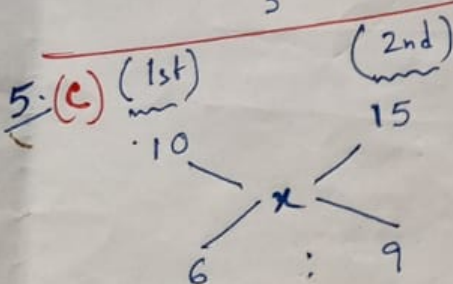
$\therefore$ Ratio of milk and water in the final mixture = $81:(100-81)$
= 81:19



$$\therefore 10x = 10$$

$$x = 1$$

$$3x = \boxed{3}$$



$$\frac{(15-x)}{(x-10)} = \frac{6}{9}$$

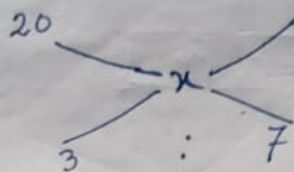
$$\Rightarrow \frac{(15-x)}{(x-10)} = \frac{2}{3}$$

$$\Rightarrow 45 - 3x = 2x - 20$$

$$\Rightarrow 5x = 65$$

$$x = \boxed{13}$$

6. (c) (Solution-1)



(Solution-2)

$$\frac{30-x}{x-20} = \frac{3}{7}$$

$$\Rightarrow 210 - 7x = 3x - 60$$

$$\Rightarrow 10x = 270$$

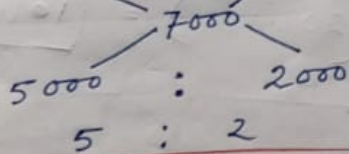
$$\Rightarrow x = \boxed{27}$$

7. (b) Others

5000

Executives

12000



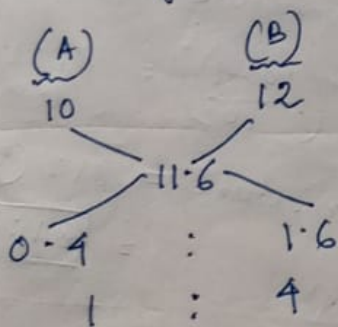
5 : 2

$$\therefore 2x = 22$$

$$x = 11$$

$$7x = \boxed{77}$$

8. (d) Percentage of interest earned = $\left(\frac{2900}{25000} \times 100 \right) = 11.6\%$

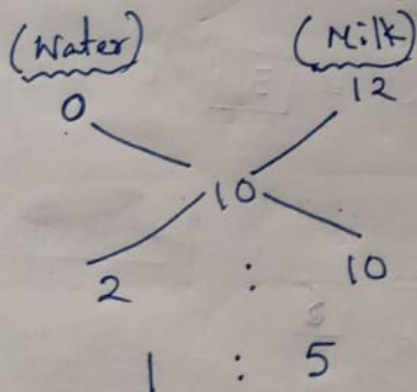


1 : 4

Ratio of amounts lent = 1:4

$$\text{Amount lent at } 12\% = \left(\frac{4}{5} \times 25,000 \right) = \boxed{20,000}$$

9. (b) Cost of the mixture = $\left(\frac{12}{1.2} \right) = ₹ 10$



1 : 5

$\therefore \frac{1}{5}$ th of 25 litres i.e;

$\boxed{5 \text{ litres}}$ of Water has to be a

10. (b) Cost of the mixture = $\left(\frac{12}{1.2}\right) = ₹ 10/\text{kg}$
 Let the cost of the second variety be ₹ x/kg and the
 cost of the first variety be ₹ $(x+7)/\text{kg}$.

(1st) (x+7)	(2nd) x	
2	5	10

$$\frac{(x+7) - 10}{10 - x} = \frac{5}{2}$$

$$\Rightarrow 2(x-3) = 5(10-x)$$

$$\Rightarrow 2x - 6 = 50 - 5x$$

$$\Rightarrow 7x = 56$$

$$\Rightarrow x = 8$$

$\therefore$ Cost of 1st Variety = $(x+7) = (8+7) = ₹ 15/\text{kg}$

11. (a) The water in the fresh grapes is evaporated you get dry grapes (or raisins with less water).

$\therefore$ So Fresh grapes can be treated as a mixture of the dry grapes and pure water.
 Water Content in dry grapes is 20%. Whereas the water content in fresh grapes is 84%.

Dry grapes:	Water
20	100
16	64
1	4

Dry grapes : Water = 1 : 4

$\therefore$ So from every 5 units of fresh grapes 1 unit of dry grapes can be obtained.

$\therefore$ We can get = $(80 \times \frac{1}{5}) \text{ kg}$
 = 16 kg of raisins.

(10)

12. (a) (1st Container) (2nd Container)
[Petrol] [Petrol]

$$\frac{4}{7} \quad \frac{3}{4}$$

$$\frac{32}{51}$$

$$\left(\frac{3}{4} - \frac{32}{51}\right) : \left(\frac{32}{51} - \frac{4}{7}\right)$$

$$\left(\frac{153-128}{4 \times 51}\right) : \left(\frac{224-204}{51 \times 7}\right)$$

$$\frac{25}{4} : \frac{20}{7}$$

$$35 : 16$$

$$\boxed{35}$$

13. (a) (Milk) (Water)
100% 0%

$$75\%$$

$$75 : 25$$

$$3 : 1$$

$\therefore$ Quantity of added water:

$$\left(\frac{1}{3} \times 36\right) = \boxed{12 \text{ litres}}$$

14. (b) Cost of each litre of milk = $\left(\frac{560}{35}\right) = ₹ 16$

(Milk) (Water)

$$16 \quad 0$$

$$14 \quad 2$$

$$7 : 1$$

$\therefore$ Quantity of water added

$$= \left(\frac{1}{7} \times 35\right) = \boxed{5 \text{ litres}}$$

15. (b) Quantity of alcohol solution

$$= \left(\frac{800-80}{800}\right)^3 \times 800$$

$$= \boxed{583.2 \text{ litres}}$$

MIXTURES AND ALLIGATIONS [ANSWER] <11>

16. (C) (A) (B)

(1st Case) (2nd Case)

$$\begin{array}{ccc} 75 & & x \\ & \searrow \quad \swarrow & \\ & 77 & \\ & \swarrow \quad \searrow & \\ 45 & & 5 \end{array}$$

$$\therefore \frac{x-77}{77-75} = \frac{9}{5}$$

$$\Rightarrow x-77 = 18$$

$$\Rightarrow x = 95$$

17. (A) (Men) (Women)

3000 10,000

8000

2000 : 5000

2 : 5

$$\therefore 2x = 80$$

$$x = 40$$

$$5x = 200$$

18. Cost of the mixture = $\frac{8 + (3 \times 12)}{4} = 11$

(1st Variety) (2nd Variety)

8 11.50

6.5 : 3

1 : 6

Required Ratio = 1:6

19. (A) Cost price of the mixture = $\left(\frac{205}{1.25}\right) = ₹ 164$

(1st type) (2nd type)

120 180

164

16 : 44

4 : 11

Ratio of the Varieties of tea = 4:11

20. (A) (Petrol) (Petrol)

$\frac{2}{7}$ $\frac{4}{7}$

$\frac{3}{7}$

$\left(\frac{4}{7} - \frac{3}{7}\right) : \left(\frac{3}{7} - \frac{2}{7}\right)$

1 : 1

Required Ratio be 1:1

(12)

21. (d) Let initially there be x litres of milk.

$$\text{Now, } \left(\frac{x-10}{x}\right)^2 = \frac{25}{25+24} \Rightarrow \frac{x-10}{x} = \frac{5}{7}$$

$$\Rightarrow 7x - 70 = 5x \Rightarrow x = \boxed{35}$$

22. (c) After 20% of the contents of the vessel are removed; remaining

$$\text{Contents} = \frac{80}{100} \times (12.5) = 10 \text{ litres}$$

Ratio of Water and milk in it = 1:4 [$\because$ W:M $\rightarrow$ 2.5:10 = 1:4]

$\therefore$ It contains $\rightarrow \left(\frac{4}{5} \times 10\right) = 8$ litres of milk and 2 litres of Water.

To reverse the ratio, x litres of Water must be added.

$$\therefore \frac{2+x}{8} = \frac{4}{1} \Rightarrow x = 30; \text{ now Water be } \rightarrow (30+2) = 32 \text{ litres}$$

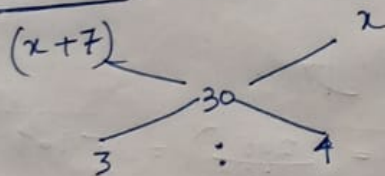
Now, y litres of milk is added to reverse the ratio.

$$\therefore \frac{32}{8+y} = \frac{1}{4} \Rightarrow y = \boxed{120}$$

23. (a) Cost price of the mixture = $\left(\frac{100}{120} \times 36\right) = \text{Rs } 30/\text{Kg}$

Now, (1st Variety)

(2nd Variety)



$$\frac{x+7-30}{30-x} = \frac{4}{3}$$

$$\Rightarrow 3(x-23) = 4(30-x)$$

$$\Rightarrow 3x - 69 = 120 - 4x$$

$$\Rightarrow 7x = 189$$

$$\Rightarrow x = \boxed{27}$$

24. (e) Quantity of milk = $\left(\frac{70}{100} \times 10\right) = 7$ litres; Quantity of Water = 3 litres

Quantity of the Water in the new solution = $(3+2) = 5$ litres

$$\therefore \text{Concentration of milk in the new solution} = \left[\frac{7}{(7+5)} \times 100\right] = \boxed{58\frac{1}{3}\%}$$

25. (c) Required Ratio of Alcohol and Water :

$$\left\{\left(\frac{2}{3} \times 6\right) + \left(\frac{4}{7} \times 35\right)\right\} : \left\{\left(\frac{1}{3} \times 6\right) + \left(\frac{3}{7} \times 35\right)\right\} = \boxed{24:17}$$