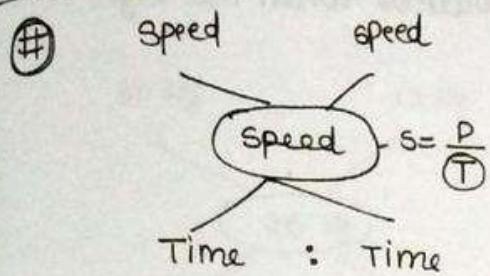


CLASS  
22

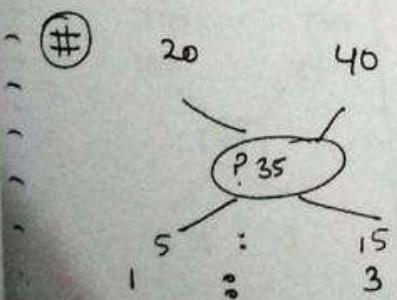
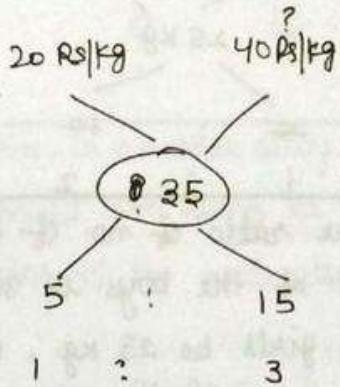
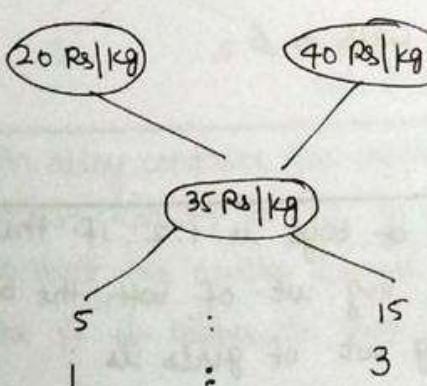
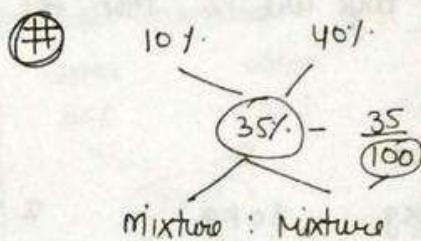
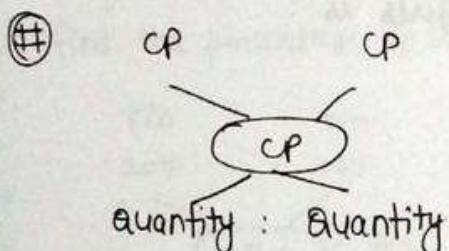
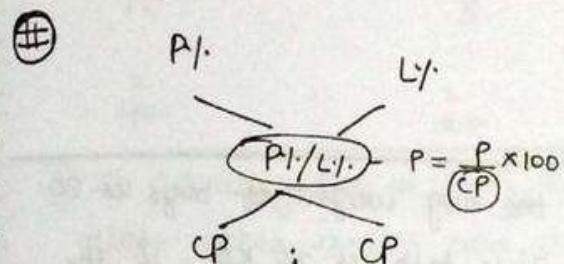
# MIXTURE & ALLIGATION

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Mean काली चीज जिसके Respect में निकाली जाती है, ratio आसी का आता है।

$S = \frac{P}{T}$ , speed को time के Respect में निकालते हैं। So.  
Time का ratio आयेगा।



$$\begin{aligned} 40-20 \\ = 20 \\ 1 : 3 \\ 5 : 15 \end{aligned}$$

- ① If the avg. weight of a class is 15 kg and the avg. weight of another class is 30 kg, then find the ratio of the students of the first class to another class students when the avg. weight of both the classes is 25 kg.

$$\begin{array}{ccc}
 15 \text{ Kg} & & 30 \text{ Kg} \\
 & \swarrow & \searrow \\
 & 25 \text{ Kg} & \\
 & \swarrow & \searrow \\
 5 & : & 10 \\
 \hline
 1 & : & 2
 \end{array}$$

- ② The avg. weight of girls is 15 and the avg. weight of boys is 30 and the avg. weight of boys and girls both is 25 kg. If the no. of boys are 12, then the no. of girls is :

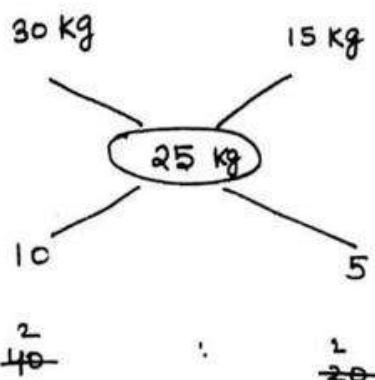
$$\begin{array}{ccc}
 G & & B \\
 15 \text{ Kg} & & 30 \text{ Kg} \\
 & \swarrow & \searrow \\
 & 25 \text{ Kg} & \\
 & \swarrow & \searrow \\
 5 & : & 10 \\
 \hline
 1 & : & 2
 \end{array}
 \quad \begin{array}{l}
 2 \rightarrow 12 \\
 1 \rightarrow 6 \\
 \text{No. of Girls} = 6
 \end{array}$$

- ③ The ratio of no. of girls to no. of boys is 1:2, if the avg. wt. of the boys is 30 kg and the avg. wt. of both the boys and girls be 25 kg, then the avg. wt. of girls is :

$$\begin{array}{ccc}
 G & & B \\
 15 \text{ Kg} & & 30 \text{ Kg} \\
 & \swarrow & \searrow \\
 & 25 \text{ Kg} & \\
 & \swarrow & \searrow \\
 5 & : & 10 \\
 \hline
 1 & : & 2
 \end{array}$$

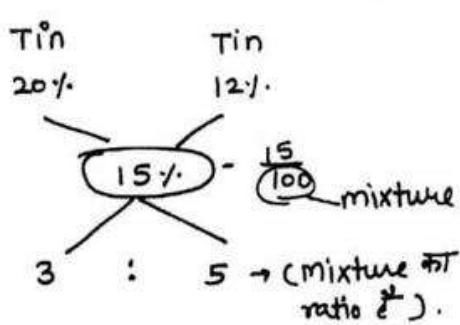
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- ④ The avg weight of a class of 40 students is 30 kg and the avg weight of a class of 20 students is 15 kg. find the avg weight of both the classes combined.



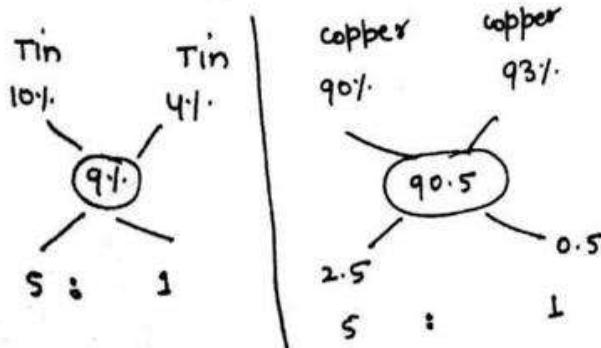
$$30 - 15 = 15 \\ 2 : 1 \\ 10 \quad 5$$

- ⑤ In an alloy 80% is copper and the remaining tin. In another alloy, copper is 85% and tin is 12%. In what ratio should the two alloys be mixed so that the new mixture must have 15% tin. Also find the percentage of copper in the new mixture.



$$\begin{array}{ccc} \text{copper} & \text{copper} & 85 - 80 = 5 \\ 80\% & 85\% & 5 \\ 1\frac{7}{8}\% & 3\frac{1}{8}\% & 3 : 5 \\ 3 & 5 & \frac{5 \times 3}{8} : \frac{5 \times 5}{8} \\ & & \frac{15}{8} : \frac{25}{8} \\ & & 3\frac{1}{8}\% \end{array}$$

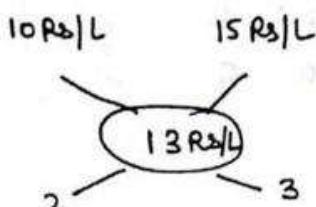
- ⑥ An alloy contains 90% copper and 10% tin, in another alloy copper is 93% and 4% is tin. In what ratio should both alloys be mixed so that the newly formed alloy contains 9% tin and also find the % of copper in this :



$$93 - 90 = 3 \\ 5 : 1 \\ 2.5 \quad 0.5$$

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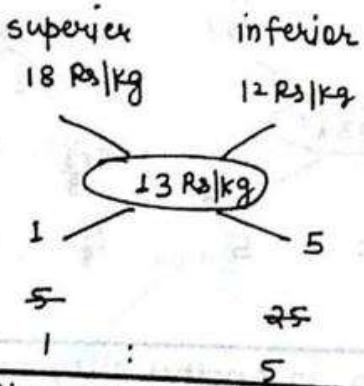
- ⑦ Two varieties of milk with different prices is mixed in the ratio 2:3. The price of 1st type of milk is Rs 10 per litre while the price of 2nd type of milk is 15 Rs/litre. The average price of the mixture :



$$\begin{matrix} 5 \\ 2 : 3 \\ 2 \quad 3 \end{matrix}$$

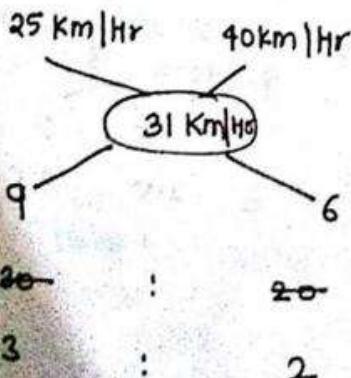
2 : 3

- ⑧ 5 kg of superior quality of rice is mixed with 25 kg of inferior quality rice. The price of superior quality & inferior quality rice is Rs 18 & Rs 12 respectively. The avg price per kg of the mixture is :



$$\begin{matrix} 6 \\ 1 : 5 \\ 1 \quad 5 \end{matrix}$$

- ⑨ Bhuvnesh travels 30 minutes at the speed of 25 km/hr. further he travels 20 minutes at the speed of 40 km/hr. find his avg. speed.



$$\begin{matrix} 15 \\ 3 : 2 \\ 9 \quad 6 \end{matrix}$$

- (10) Bhuvnesh covered 150 km distance in 10 hours. The 1st part of his journey he covered by car, then he hired a rickshaw. The speed of car & rickshaw is 20 km/hr and 12 km/hr respectively. The ratio of distance covered by car & the rickshaw respectively are :

car              Rickshaw

20 km/hr        12 km/hr



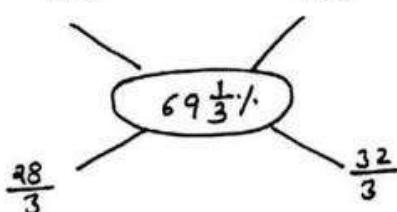
$$\frac{150}{10} = 15 \text{ km/hr}$$

3 : 5 (Time ratio)

C	R
$20 \times 3$	$12 \times 5$
$\cancel{60}$	$\cancel{60}$
1	1

- (11) A milkman has two type of milk. In the 1st container the % of milk is 80% and in the 2nd container the percentage of milk is 60%. If he mixes 28 litres of the first container to the 32 litre of milk of the 2nd container, then the % of milk in the mixture is :

80%              60%

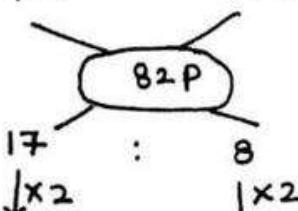


$$\frac{28}{3} : \frac{32}{3}$$

$$\begin{array}{c} 20 \\ 7 : 8 \\ \hline 20 \times \frac{7}{15} \quad 20 \times \frac{8}{15} \\ \frac{28}{3} \quad \frac{32}{3} \end{array}$$

- (12) A sum of Rs 41 was divided 50 student. If each boy got 90 paise & each girl got 65 paise. find the no. of boys.

Boy              Girl  
90 P              65 P



$$\begin{array}{c} 17 : 8 \\ \downarrow \times 2 \quad \downarrow \times 2 \\ 34 \text{ boys} \quad 16 \text{ girls.} \end{array}$$

$$\frac{4100}{50} = 82 \text{ P}$$

$$17+8 = 25 \rightarrow 50$$

90P boy 4500	GirL 3250P 4100P
$\cancel{850}$	$\cancel{400}$
17	8

- (13) A sum of Rs 39.60 36.90 is made up of 90 coins that are either 20 paise coins or 50 paise coins. find out how many 20 paise coins are there in the total amount.

$$\begin{array}{ccc}
 20P & 50P & \\
 \text{---} & \text{---} & \\
 9 & 21 & \\
 3 & 7 & \\
 \downarrow \times 9 & \downarrow \times 9 & \\
 27 \text{ coins} & 63 \text{ coins} &
 \end{array}$$

$$\begin{array}{r}
 41 \\
 3690 \\
 \hline
 96
 \end{array}$$

$$\begin{array}{ccc}
 20P & 50P & \\
 \text{---} & \text{---} & \\
 10 \rightarrow 90 & & \\
 1 \rightarrow 9 & & \\
 \text{---} & & \\
 1800 & 4500 & \\
 \text{---} & \text{---} & \\
 3690 & & \\
 \text{---} & & \\
 36P : 1890 & & \\
 27 : 63 & & \\
 3 : 7 & & \\
 \text{---} & & \\
 & & 
 \end{array}$$

- (14) Rs 69 were divided among 115 students so that each girl gets 50 paise less than a boy. Thus each boy received twice the paise as each girl received. The no. of girls in the class is :

$$\begin{array}{ccc}
 100P & 50P & \\
 \text{---} & \text{---} & \\
 B & G & \\
 \text{---} & \text{---} & \\
 11500 & 5750 & \\
 \text{---} & \text{---} & \\
 1150 & 6900 & \\
 \text{---} & \text{---} & \\
 1150 & 4600 & \\
 \text{---} & \text{---} & \\
 1 : 4 & & \\
 \text{---} & & 
 \end{array}$$

$$\begin{array}{ccc}
 B & G & \\
 \text{---} & \text{---} & \\
 2x & x & \\
 \text{---} & \text{---} & 
 \end{array}$$

$$2x - x = 50$$

$$x = 50$$

$$143 \rightarrow 115$$

$$1 \rightarrow 23$$

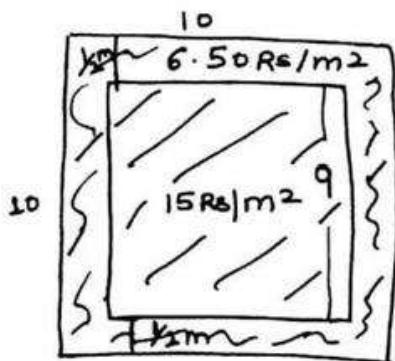
$$\text{No. of Girls} \rightarrow 23 \times 4 = 92$$

- (15) A student get +3 marks for each right answer and -0.5 mark for each wrong answer in an exam consists of 250 questions. If the student gets 477 marks in the exam, find the no. of wrong questions attempted by student.

$$\begin{array}{ccc}
 +3 & & \\
 \text{---} & & \\
 +750 & & \\
 \text{---} & & \\
 602 & 273 & \\
 \text{---} & \text{---} & \\
 86 & : 39 & \\
 \text{---} & & 
 \end{array}$$

$$\begin{array}{r}
 86 + 39 \\
 = 125 \rightarrow 250 \\
 1 \rightarrow 2 \\
 \text{Wrong Ques} = \\
 39 \times 2 = 78
 \end{array}$$

- (16) In the centre of a square room of side 10 metre, there is a square carpet and the rest of the floor is covered with cloth. If the cost of covering the full floor is 1338.50 Rs and the price of carpet and cloth is 15 Rs/m<sup>2</sup> and 6.50 Rs/m<sup>2</sup> respectively. find the width of the cloth border.



$$\text{Area} = 100 \text{ m}^2$$

<u>carpet</u>	<u>cloth</u>
15 Rs/m <sup>2</sup>	6.50 Rs/m <sup>2</sup>

$$13.3850 \text{ Rs/m}^2 \rightarrow \frac{1338.50}{100}$$

$$\text{carpet area} = 81 \text{ m}^2$$

$$\text{carpet side} = 9 \text{ m}$$

$$\text{width of cloth} = 10 - 9 = 1 \text{ m}$$

$$\frac{1}{2} \text{ m (both sides)}$$

81	19	( Ratio of Area )
↓	↓	
carpet	Cloth.	

- (17) In a Delhi zoo, there are deers & ducks. if the heads are counted there are 180 while the legs are 448. What will be the no. of deers in the zoo.

+2	+4
DUCK	Deer
360	720

$$448 : 272 \quad (\text{Ratio of animals})$$

$$34 : 11$$

$$34+11 \rightarrow 45 \rightarrow 180$$

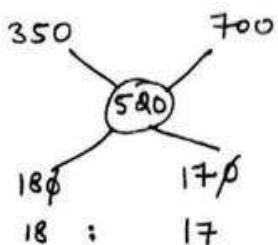
$$1 \rightarrow 4$$

By:  
Pardeep Chhokket  
7206446517

$$\text{No. of deers} = \\ 11 \times 4 = 44 \text{ Ans}$$

- (18) In a MCD parking there are some two wheelers & rest are four wheelers. If wheels are counted, there are total 520 wheels but the incharge of the parking told me that 176 wheels but the incharge of the parking told me that 176 there are only 175 vehicles. If no vehicle has a stepney then the no. of two wheelers is :

2wheelers      4wheelers



$$35 \rightarrow 175$$

$$1 \rightarrow 5$$

$$\text{No. of two wheelers} = 18 \times 5 \Rightarrow 90 \text{ Ans}$$

- (19) In my pocket there are Rs 25 consisting of only the denominations of 20 paise & 50 paise. Thus there are total 80 coins in my pocket. The no. of coins of the denomination of 50 paise is :

20P

50P

$$15+9 \Rightarrow 24 \longrightarrow 80$$

1600

4000

$$1 \longrightarrow \frac{80}{24} = \frac{10}{3}$$



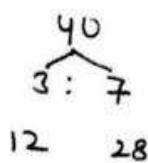
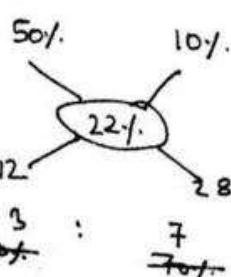
No. of 50P coins =

$$3 \times \frac{10}{3} = 30 \text{ coins Ans}$$

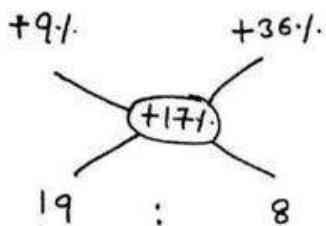
- (20) Rakesh Yadav reader publication sold the 50% books at the profit of 50% and 70% books at the profit of 10%. The avg profit percent of the publication shop is, if it sells only these two kinds of books.

50%

10%



- (21) A bus agency has 108 buses. He sold some buses at 9% profit and rest at 36% profit. Thus he gains 17% on the sale of all the buses. The no. of buses sold at 36% P is :

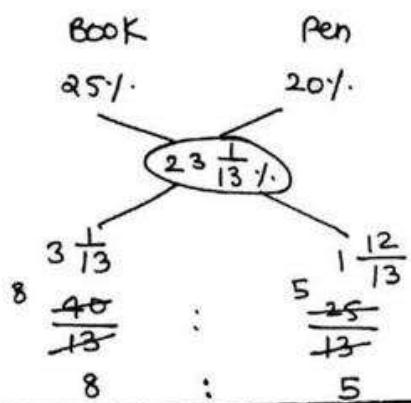


$$\begin{array}{r} 27 \longrightarrow 108 \\ 1 \longrightarrow 4 \end{array}$$

No. of Buses sold at 36% profit =  
 $8 \times 4 = 32$



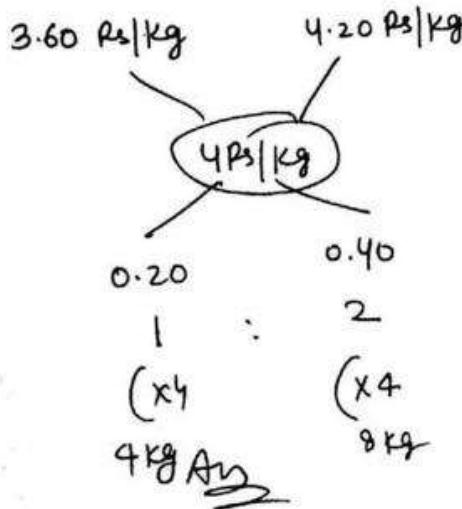
- (22) A man purchased a pen & book for Rs 1300. He sold the pen at a profit of 20% and the book at a profit of 25%. In this way, his total profit was 23  $\frac{1}{13}\%$ . find the CP of book.



$$\begin{array}{r} 13 \longrightarrow 1300 \\ 1 \longrightarrow 100 \end{array}$$

cost price of Book =  $8 \times 100 = 800$

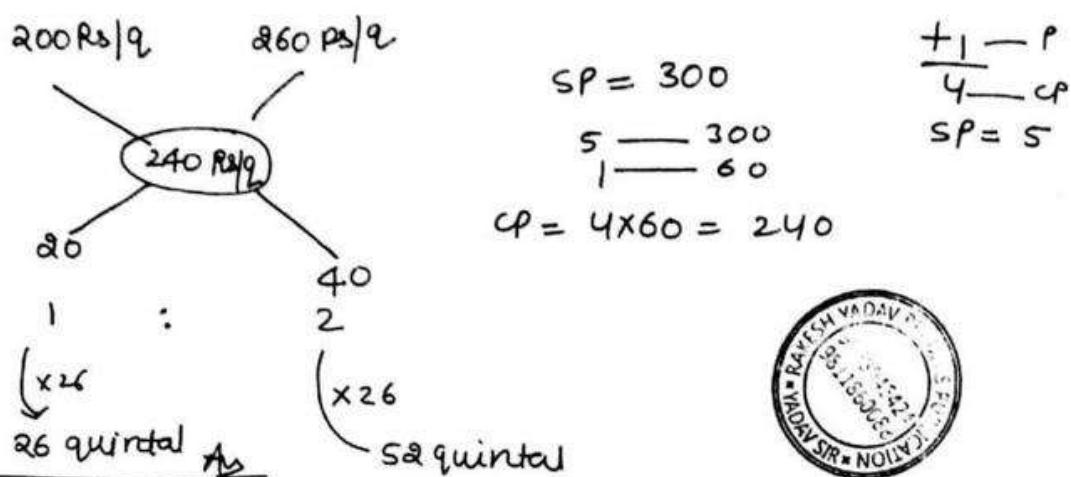
- (23) How many kg of sugar worth Rs 3.60 per kg should be mixed with 8 kg of sugar worth Rs 4.20 per kg such that by selling the mixture at Rs 4.40 per kg, there may be a gain of 10%.



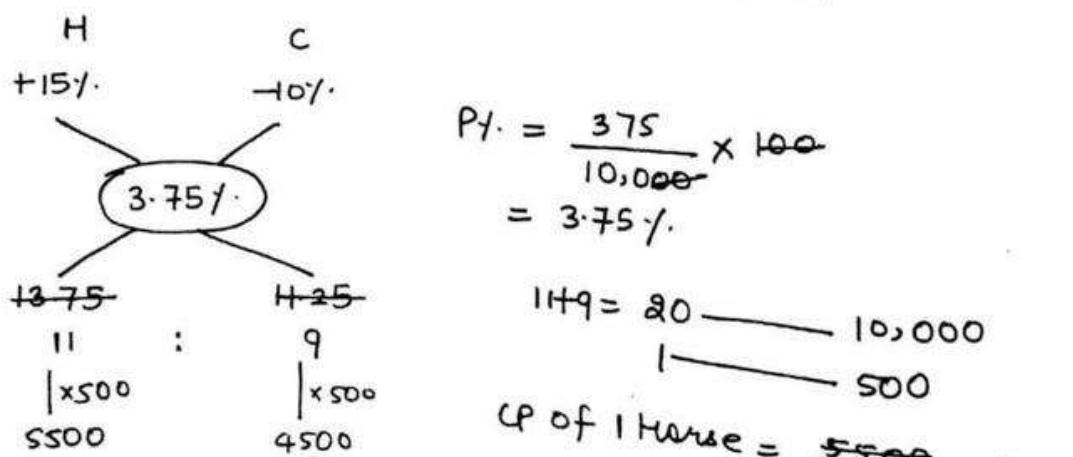
$$SP = 4.40 \text{ Rs/kg} \quad \begin{matrix} \leftarrow 0.4 \\ \rightarrow 11 \end{matrix}$$

$$CP = 4.00 \text{ Rs/kg} \quad \begin{matrix} \leftarrow 0.4 \\ \rightarrow 10 \end{matrix}$$

- (24) A shopkeeper purchased two qualities of pulses at the rate of 178  
200 Rs per quintal and Rs 260 per quintal. In 52 quintal of  
the 2nd quality, how much pulse of the 1st quality  
should be mixed so that by selling the resulting mixture  
at Rs 300 per quintal, he gains a profit of 25%.



- (25) A man purchased 5 horses and 10 cows of Rs 10,000. He sells  
the horse at 15% p and cow at 10% less. find the cost  
of each horse if he earns a profit of 375.



$$11+9 = 20 \quad 10,000$$

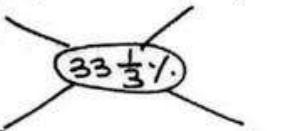
$$CP \text{ of 1 Horse} = \frac{5500}{20} = 275$$

$$CP \text{ of 1 Cow} = \frac{4500}{18} = 250$$

- (26) 20 pens and 16 pencils are purchased by a man for Rs 360.  
He sold the pens at 25% p and pencils at  $\frac{7}{5}$  of its cost price.  
find the price of each pencil, if he earns profit of Rs 120  
at the end:

Pen      Pencil  
85%      40%

$$\frac{1}{5} \times 100 = 40\% \quad 179$$



$$P.I. = \frac{120}{360} \times 100$$

$$4+5 = 9 \longrightarrow 360$$

$$1 \longrightarrow 90$$

$$4 \frac{2}{3} : 5 \frac{25}{3}$$

$$\begin{aligned}\text{Price of 1 pencil} &= \frac{200}{16} \\ &= 12.50 \text{ Rs}\end{aligned}$$



27) A man purchased two chairs in Rs 900, he sells the 1st chair at  $\frac{4}{5}$  of its cost price while the 2nd chair is sold at  $\frac{5}{4}$  of its cost price. if during the whole transaction he earns a profit of 90 Rs, find the cost price of cheaper chair.

I II  
-20% +25%

$$\frac{4}{5} \times 100 = -20\%$$

$$\frac{5-5P}{4-4P} \times 100 = +25\%.$$

$$P_1 = \frac{90}{900} \times 10^6 = 10\%$$

10/1

15 : 30

1 : 2

↓      ↓

300 Rs      600 Rs

$$3 \rightarrow \begin{matrix} 900 \\ 300 \end{matrix}$$

360Rs      600Rs

Q8 A mixture of sugar is sold at Rs 3.00 per kg. This mix. is formed by mixing the sugar of Rs 2.10 and Rs 2.52 per kg. What is the ratio of cheaper to the costlier quality in the mixture if profit of 25% is earned?

25%  $\rightarrow$  3

2.10 2.52

$$\frac{+1}{4} \text{---} 4 \quad \begin{array}{l} SP \rightarrow S \\ 1 \longrightarrow \end{array} \quad \begin{array}{l} 3 \\ \frac{3}{5} \\ 4 \longrightarrow \frac{3}{5} \times 4 = 2 \cdot 4 \end{array}$$

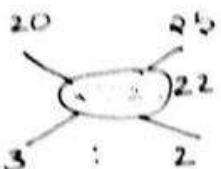


$$\frac{0.12}{2} : \frac{0.30}{5} \quad \text{Ans}$$

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- (29) Pukash Yadav sells two types of books viz national books and international books. He sells national books at Rs 18 per book and incurs at loss of 10%. whereas on selling the international books at Rs 30 per book, he gains 20%. In what proportion should the national books and international books be mixed such that he can gain a profit of 25% by selling the combined books at 27.5 Rs per book.

$$\text{I} \quad \text{II} \quad 10\% = \frac{-1}{10} \quad \begin{matrix} SP \rightarrow 9 \rightarrow 18 \\ 1 \rightarrow 2 \end{matrix}$$

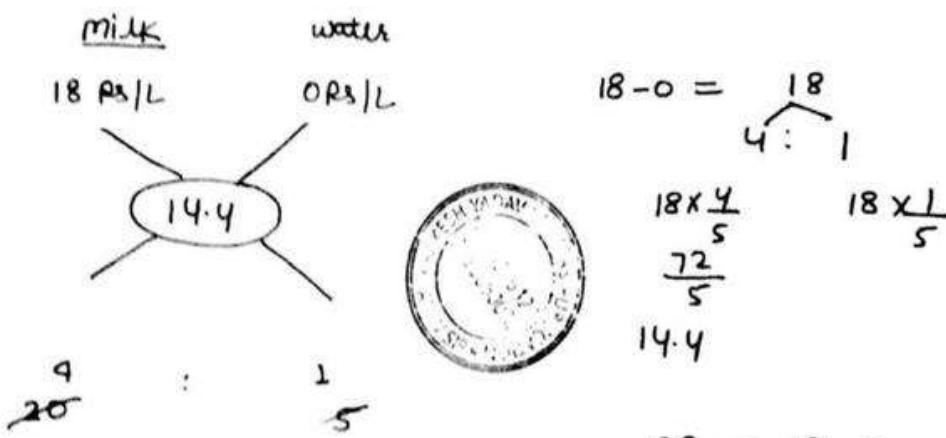


$$\begin{matrix} \frac{1}{5} & 6 \rightarrow 30 \\ 1 \rightarrow 5 \\ CP \rightarrow 5 \rightarrow 25 \end{matrix}$$

$$SP = 27.50 \leftarrow \frac{15}{20} \times 25$$

$$CP = 4 \times 25 = 22$$

- (30) A milkman has 20 litres of milk. if he mixes 5 litres of water, w/c is freely available in 20 litres of pure milk. If the cost of pure milk is Rs 18 per litre, then the profit of the milkman when he sells all the mixture at cost price, is :



- (31) In what ratio should water and soda be mixed that after selling the mixture at the cost price at profit of 33.33% is made?

water      soap  
0 Rs/l      40 Rs/l (let)

$$\begin{array}{l} \text{30 Rs/l} \\ \text{10 : 30} \\ 1 : 3 \end{array}$$

$$SP = 40 \text{ Rs/l} \quad \frac{+1}{3} \quad 181$$

$$CP = 30 \text{ Rs/l}$$

$$4 \rightarrow 40 \\ 1 \rightarrow 10$$

$$\text{OR} \quad 33\frac{1}{3}\% = \frac{1}{3} \begin{matrix} \text{free} \\ \rightarrow \text{paid} \end{matrix} \quad \begin{matrix} \text{when mix} \\ \text{is sold} \\ \text{at its} \end{matrix}$$

- (32) A milkman sells the milk at cost price but he mixes the water in it and thus he gains 9.09%. The quantity of water in the mixture of 1L is :

$$9.09\% = 9\frac{1}{11}\% = \frac{1}{11} \begin{matrix} \text{water} \\ \text{milk} \end{matrix}$$

$$\begin{matrix} \text{milk} & \text{water} \\ \parallel & \parallel \\ 1 & \end{matrix}$$

12 litre mixture — 1 L water

$$1 \parallel \quad \parallel \quad - \quad \frac{1}{12} \text{ L water}$$

By.  
Pardeep Chhokker  
7206446517

- (33) A dishonest grocer professes to sell pure milk at CP, but he mixes it with adulterated fat and thereby gains 25%. Find the percentage of adulterated fat in the mixture assuming that adulterated fat is freely available.

$$\begin{matrix} \text{milk} & \text{water} \\ 4 & : \quad 1 \end{matrix}$$

$$25\% = \frac{1}{4}$$

$$\frac{1}{5} \times 100 = 20\%$$



- (34) The price of petrol is Rs 60 per litre and the price of oil is Rs 40 per litre. In what ratio the petrol and oil be mixed such that the profit after selling the mixture at Rs 75 per litre be 25%.

$$\begin{array}{l} 60 \quad 40 \\ \text{60} \\ 20 : 0 \end{array}$$

$$25\% = \frac{1}{4}$$

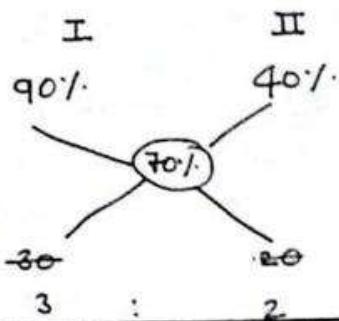
$$SP = 5 \quad 75 \\ 1 \quad 15$$

$$CP = 4 \times 15 = 60$$

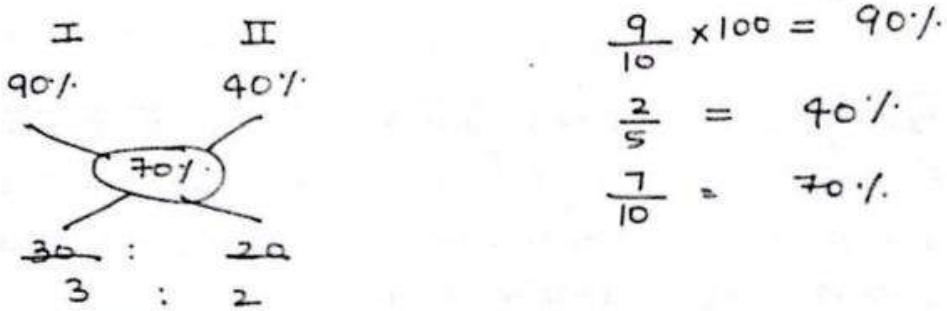
such a mix is not possible.

- 35) Two vessels contain milk & water. In 1st vessel milk is 90% and in 2nd vessel milk is 40%. In what ratio should be mix both these vessels to obtain a new mixture w/c contain 70% milk.

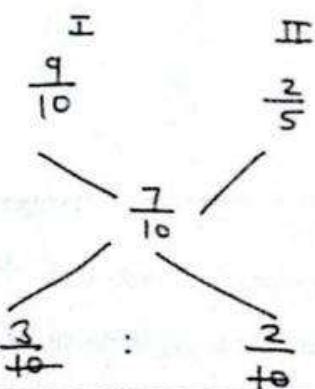
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- 36) Two vessel contain milk and water in the ratio 9:1 and 2:3. In what ratio should both vessel is mixed w/c contain milk & water in the ratio 7:3.



(OR)



- 37) The ratio of water and wine in two diff. containers is 2:3 and 4:5. In what ratio we are required to mix the mixture of two containers in order to get the new mixture in w/c the ratio of wine and water be 7:5.

$$\begin{array}{ccc}
 \text{I} & & \text{II} \\
 \frac{2}{5} & & \frac{4}{9} \\
 & \text{---} & \\
 & \frac{5}{12} & \\
 & \text{---} & \\
 \frac{4}{9} - \frac{5}{12} & : & \frac{5}{12} - \frac{2}{5} \\
 & \text{---} & \\
 \frac{1}{36} & : & \frac{1}{60} \\
 & \text{---} & \\
 \frac{1}{3} & : & \frac{1}{5} \\
 & \text{---} & \\
 5 & : & 3
 \end{array}$$

- (38) Two vessels contain spirit and water respectively in the ratio 1:3 and 2:5. Find the ratio in w/c they are to be mixed to get a new mixture in w/c the ratio of spirit to water is 1:2

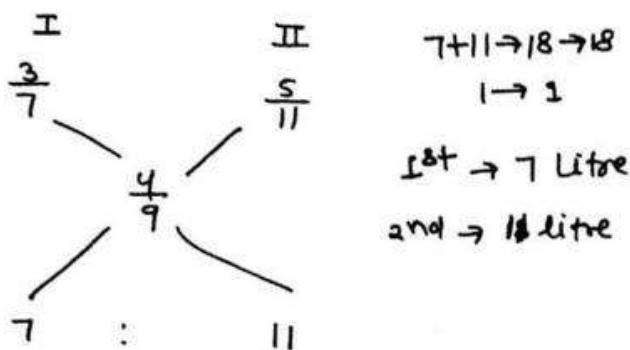
$$\begin{array}{ccc}
 \text{I} & & \text{II} \\
 \frac{1}{4} \times 24 & & \frac{3}{8} \times 24 \\
 & \text{---} & \\
 & 6 & 9 \\
 & \text{---} & \\
 & 8 & \\
 & \text{---} & \\
 \frac{1}{3} \times 24 & & \\
 & \text{---} & \\
 1 & : & 2
 \end{array}$$

- (39) Two vessels contain a mixture of milk and water. In the 1st vessel the ratio of milk to water is 8:3 and in 2nd vessel the ratio is 5:1. A 35 L cask is filled from these vessels so as to contain a mixture of milk and water in the ratio of 4:1. How many litres are taken from the 1st vessel.

$$\begin{array}{ccc}
 \text{I} & & \text{II} \\
 \frac{8}{11} & & \frac{5}{6} \\
 & \text{---} & \\
 & 4 & \\
 & \text{---} & \\
 \frac{5}{6} - \frac{4}{5} & & \frac{4}{5} - \frac{8}{11} \\
 & \text{---} & \\
 11 & : & 24
 \end{array}$$

$$\begin{array}{r}
 11+24 \rightarrow 35 \rightarrow 35 \\
 1 \rightarrow 1 \\
 \\ 
 11 \text{ Ur} - \text{I} \\
 24 \text{ Ur} - \text{II}
 \end{array}$$

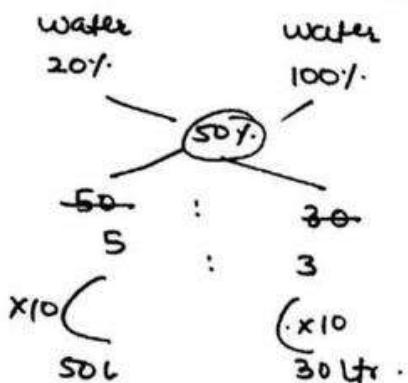
- (40) Rakesh Yadav purchased two diff kinds of alcohol. In the first mixture the ratio of alcohol to water is 3:4 and in the 2nd mixture it is 5:6. If he mixes the two given mixture and makes a third mixture of 18 litre in w/c the ratio of alcohol to water is 4:5. The quantity of first mixture is required to make the 18 litres of the 3rd kind of the mixture.



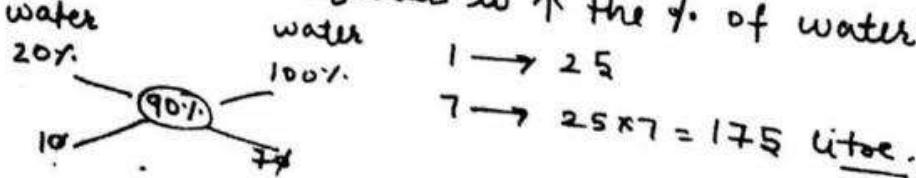
CLASS

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- (41) A mixture of water & milk contains 80% milk. In 50L of such a mixture, how many litres of water is required to increase the % of water to 50%?



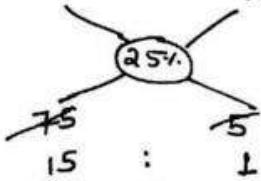
- (42) In ~~85L~~ mix. of milk & water, water is only 20%. How many litres of water is required to ↑ the % of water to 90%?



- (43) A mix of 125 gallons of wine & water contains 20% wine.  
 How much wine must be added to mix. in order to ↑ the % of wine to 25% of the new mixture?

wine                      wine  
20%                    100%.

$$15 \rightarrow 125$$



185

$$1 \rightarrow \frac{125}{15}$$

8.33 gallons.

- (44) A mix of 20L of milk & water contains ~~44%~~ 10% water.  
 How much water should be added to it to ↑ the % of water to 25%.

water                      water  
10%                    100%.

$$5 \rightarrow 20$$

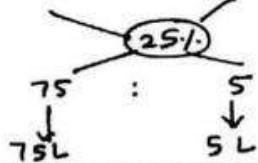
$$1 \rightarrow 4$$

4 L Ans



- (45) In the 75 litre of mix of soda & water, ratio of soda & water is 4:1. the quantity of water required to make the ratio of soda & water 3:1 is :

water                      water  
20%                    100%.



- (46) The quantity of mix of milk & water is 70 L. This mix contains 10% water. How many litres of water should be mixed in the mixture to make 25% water in the mixture.

water                      water  
10%                    100%.

$$5 \rightarrow 70$$

$$1 \rightarrow 14 \text{ L } \underline{\text{Ans}}$$



- (47) In 50L of water & milk mixture, water is 20%. The milk man gives 10L of this mix. to a customer and then he adds up 10L of pure water in the remaining mix. the % of water in the final mix is -

$$\begin{array}{ccc}
 \text{water} & \text{water} & 100 - 20 \\
 20\% & 100\% & = 80 \\
 & & 4 : 1 \\
 & & 64 \quad 16 \\
 \text{---} & \text{---} & \text{---} \\
 \text{36% Ans} & & \\
 \text{---} & \text{---} & \text{---} \\
 4 : & 2 & \\
 \text{40lt} & \text{10lt} & \\
 \text{---} & \text{---} & \text{---}
 \end{array}$$



- (48) The diluted alcohol contains 8 L of alcohol and the rest is water. A new mix is w/c concentration of alcohol is 30%. It is to be formed by replacing diluted alcohol. How many litres of mixture shall be replaced with pure alcohol if there was initially 32 L of water in the mixture.

$$\begin{array}{ccc}
 \begin{array}{c}
 \text{A} \quad W \\
 \frac{8}{20\%} \quad \cancel{32} \\
 1 : 4 \\
 A = \frac{1}{5} = 20\%
 \end{array} &
 \begin{array}{c}
 \text{A} \quad \text{A} \\
 20\% \quad 100\% \\
 7 : 1 \\
 \cancel{70} \quad 10 \\
 + \quad \\
 \text{Remaining mix.}
 \end{array} &
 \begin{array}{l}
 7+1 = 8 \rightarrow 40 \\
 1 \rightarrow 5 \\
 \text{5 litre pure alcohol is added.}
 \end{array}
 \end{array}$$



- (49) In a mix of milk & water, there is only 26% water. After replacing the mixture with 7 litres of pure milk, the % of milk in the mix becomes 76%. The quantity of mixture is

$$\begin{array}{ccc}
 \begin{array}{c}
 \text{milk} \quad \text{milk} \\
 74\% \quad 100\% \\
 24 : 2 \\
 12 : 1 \\
 (x7) \quad \downarrow \\
 \text{Remaining mix.} \quad 7L
 \end{array} &
 \begin{array}{c}
 12 \rightarrow 12 \times 7 \\
 = 84L \\
 \text{mix} = 84 + 7 \\
 = 91L
 \end{array} &
 \end{array}$$

- (50) The ratio of oil & kerosene in the container is 3:2 when 10L of mixture is taken out and replaced by kerosene, the ratio becomes 2:3. The total quantity of the mixture in the container is ?

$$\begin{array}{ccc}
 & \text{Kerosene} & \text{Kerosene} \\
 & 90\% & 100\% \\
 & \swarrow 60\% & \searrow \\
 40 & : & 20 \\
 & \downarrow 2 & \downarrow 1 \\
 \text{Remaining mix} & & 10 \text{ Ltr}
 \end{array}$$

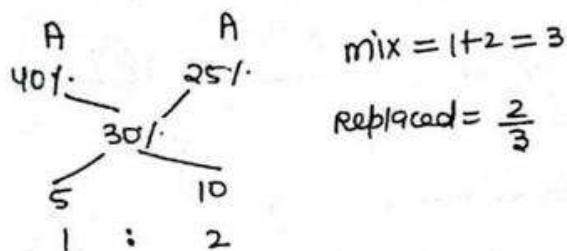
$$\text{Total mix} = 2+1 = 3$$

$$1 \rightarrow 10$$

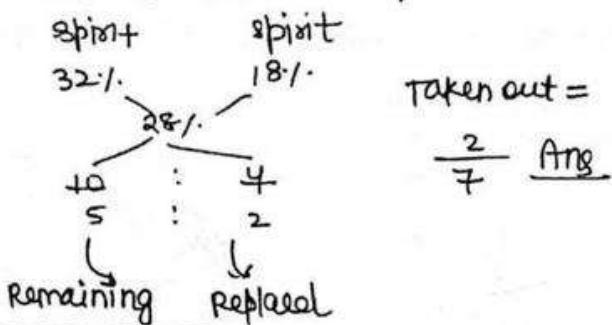
$$3 \rightarrow 30 \text{ L}$$

$$10 \text{ L}$$

$$3 \text{ L}$$



- 54) In a wine 32% spirit, some quantity taken out and replaced with another type that contains 18% spirit. Now the spirit in the bottle is 28%. find what part of the wine is taken out?



- 55) A vessel is full of 80 L milk, 8 L taken out & replaced by water. Again 8 L taken out and replaced by water. find the amount of milk in the final mixture so formed.

$$\text{final quantity} = \text{Initial quantity} \left(1 - \frac{x}{c}\right)^n$$

$c \rightarrow$  capacity of vessel

$x \rightarrow$  quantity taken out at a time

$n \rightarrow$  no. of process.

$$\begin{aligned} \text{final quantity} &= 80 \left(1 - \frac{8}{80}\right)^2 \\ &= 80 \times \frac{9}{10} \times \frac{9}{10} \\ &= 64.8 \text{ L} \end{aligned}$$

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- (66) A gas cylinder contains mix of oxygen & nitrogen. If 10% oxygen is 36% of the mixture, some litres of the mix is taken out and replaced by nitrogen and this process is repeated one more time. At the end oxygen remained 9%. of the mixture, find the quantity of mixture taken out at a time.

$$\frac{9^2}{100} = \frac{36}{100} \left(1 - \frac{x}{25}\right)^2$$

Square both sides

$$1 = 2 \left(1 - \frac{x}{25}\right)$$

$$x = 12.5 \text{ litre.}$$

By:  
Pardeep Chhokker  
7206446517

- (67) From the 50L of pure milk, 5L of milk is taken out and 5 L water is added. This processes is repeated 3 times, the amount of milk left after the 3rd replacement

$$\text{Final Q.} = 50 \left(1 - \frac{5}{50}\right)^3$$

$$= 50 \times \frac{9}{10} \times \frac{9}{10} \times \frac{9}{10} = \frac{9 \times 9 \times 9}{20} = 36.45 \text{ mlto}$$

- (68) From a 200L tank of petrol, the seller replaces each time with kerosene when he sells 40 litres of petrol (or its mixture). Every time he sells out only 40L of petrol (pure or impure). After replacing the petrol with kerosene 4th time the total amount of kerosene in the mix is →

$$\text{final Q. of petrol} = 200 \left(1 - \frac{40}{200}\right)^4$$

$$= 200 \times \frac{4}{5} \times \frac{4}{5} \times \frac{4}{5} \times \frac{4}{5} = 81.92 \text{ L}$$

$$\begin{aligned} \text{Kerosene} &= \frac{200}{81.92} \\ &= 118.08 \text{ L} \end{aligned}$$

- (59) A jar is full of milk. A person draw out 20% of the milk from the jar and replaced it with sugar solution. He has repeated the same process 4 times and thus there was only 512 gm of milk left in the jar, the rest part of the jar was filled with sugar soln. The initial amt. of the milk in the jar was :

$$512 = \text{initial} \left(1 - \frac{1}{5}\right)^4$$

$$\cancel{\text{initial}}^2 = \text{initial} \times \frac{256}{625}$$

$$\text{initial milk} = 625 \times 2 = 1250 \text{ gm.}$$

- (60) A vessel is full of milk,  $\frac{63}{63}$  L. if 9L of milk is taken out and replaced by same amt. of water and further 7 L mixture is taken out and replaced by same amt. of water then find at the end of 2nd process the amount of water in the mixture ?

$$63 \left(1 - \frac{9}{63}\right) \left(1 - \frac{7}{63}\right)$$

$$= 63 \times \frac{6}{7} \times \frac{8}{9}$$

$$\text{final q. of milk} = 48 \text{ L}$$

$$\text{water} = 63 - 48 = 15 \text{ L}$$

- (61) A vessel is full of milk. 15 L of milk is taken out & replaced by water. this process is repeated once more. find the initial amt. of milk in the vessel if at the end the ratio of milk & water becomes 16:9.

$$16 = 25 \left(1 - \frac{15}{c}\right)^2$$

square root

$$4 = 5 \left(1 - \frac{15}{c}\right)$$

$$c = 75 \text{ ltr}$$

Starting milk	end milk	
25	16	
		Process is 2 Times, so
$\sqrt{25} : \sqrt{16}$	4	
milk	1 → 15	
		$15 \times 5 = 75 \text{ ltr}$

end m: w  
16: 9  
mix → 25  
means starting  
if off 25 qT  
milk.

7(62) From a container of beer, a thief has stolen 15 litres of 191 beer and replaced it with same quantity of water. He again repeated the same process. Thus in three attempts the ratio of beer and water became 343 : 169. The initial amount of beer in the container was :

$$\begin{array}{l} \text{Beer} \\ \text{343} \end{array} \quad \begin{array}{l} \text{water} \\ \text{169} \end{array}$$

$$343 + 169 = 512 \quad \text{Beer in starting}$$

$$\begin{array}{l} \text{Starting Beer} \\ 512 \end{array} \quad \begin{array}{l} \text{End Beer} \\ 343 \end{array}$$

3 process, so cube root

$$\sqrt[3]{512} \quad \sqrt[3]{343}$$

$$\begin{array}{c} 8 \\ \text{Beer} \\ \text{of starting} \\ \text{में सारे} \end{array} \quad : \quad \begin{array}{c} 7 \\ 1 \longrightarrow 15 \text{ L} \\ 8 \longrightarrow 15 \times 8 = 120 \text{ L} \end{array}$$

63) Some amount out of Rs 6000 was lent out at 10% per annum and the rest amount at 20% per annum and thus in 4 years the total interest from both the amounts collected was Rs 3400. What is the amount w/c was lent out @ 10% per annum ?

$$\begin{array}{ccc} 10\%. & & 20\%. \\ \swarrow & & \searrow \\ 14\frac{1}{6}\% & & \\ \swarrow & & \searrow \\ 5\frac{5}{6} & & 4\frac{1}{6} \\ \swarrow & & \searrow \\ 35 & & 25 \\ 7 & : & 5 \end{array} \quad \begin{array}{l} \frac{6000 \times r \times 4}{100} = 3400 \\ r = 14\frac{1}{6}\% \\ \frac{1800}{12} \rightarrow 6000 \\ 1 \rightarrow 500 \end{array} \quad 7 \rightarrow 3500 \text{ Rs } \underline{\underline{Am}}$$

64) Two vessel contain a mixture of milk & water in ratio 1:2 and 2:3. If both vessel are mixed in ratio 1:1 then find the ratio of milk & water in new mixture.

$$\begin{array}{ll} m : w & m : w \\ 1 : 2 & 2 : 3 \\ \underbrace{1 \times \frac{1}{3}}_{1 \times \frac{2}{3}} & \underbrace{1 \times \frac{2}{5}}_{1 \times \frac{3}{5}} \end{array} \quad \begin{array}{l} m = \frac{1}{3} + \frac{2}{5} = \frac{11}{15} \\ w = \frac{2}{3} + \frac{3}{5} = \frac{19}{15} \\ m:w = 11:19 \end{array}$$

$$A \frac{m}{1 \times 5} : \frac{w}{2 \times 5} = 3 \times 5$$

$$B \frac{2 \times 3}{11} : \frac{3 \times 3}{19} = 5 \times 3$$

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## RATIO & PROPORTION

- 65 Two vessel contain milk & water in the ratio 7:5 and 7:9 if both vessel are mixed in ratio 1:1 , find the ratio of milk and water in new mixture ?

$$A \frac{M}{7 \times 4} : \frac{W}{5 \times 4} = 12 \times 4$$

$$B \frac{7 \times 3}{49} : \frac{9 \times 3}{47} = 16 \times 3$$

- 66 Three vessel each of ~~10~~ litre capacity contain a mixture of milk & water in the ratio 2:1, 3:1 and 3:2 . if all the three vessels are emptied into a large vessel , find the ratio of milk & water in new mixture ?

$$A \frac{m}{2 \times 20} : \frac{w}{1 \times 20} = 3 \times 20$$

$$B \frac{3 \times 15}{3 \times 15} : \frac{1 \times 15}{4 \times 15} = 4 \times 15$$

$$C \frac{3 \times 12}{121} : \frac{2 \times 12}{59} = 5 \times 12$$



- 67 Two vessel A & B contain a mixture of milk & water in the ratio 4:5 and 5:1 . In what ratio should quantities of mixture be taken If both vessel are mixed in the ratio 5:2 . find the ratio of milk & water in new mixture.

$$M : W$$

$$A \frac{4 \times 10}{4 \times 10} : \frac{5 \times 10}{5 \times 2} = 9 \times 2 = 18 \times 5$$

$$B \frac{5 \times 6}{70} : \frac{1 \times 6}{56} = \frac{6 \times 3}{56} = 18 \times 2 \Rightarrow 5:4$$

$$A \quad \frac{m}{w} : \frac{1 \times 5}{2 \times 5} = \frac{3 \times 5}{5 \times 5}$$

$$B \quad \frac{2 \times 3}{11} : \frac{3 \times 3}{19} = \frac{5 \times 3}{19}$$

19.

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## RATIO & PROPORTION

- 65) Two vessel contain milk & water in the ratio 7:5 and 7:9 if both vessel are mixed in ratio 1:1 , find the ratio of milk and water in new mixture ?

$$M : W$$

$$A \quad \frac{7 \times 4}{5 \times 4} : \frac{5 \times 4}{12 \times 4} = \frac{12 \times 4}{12 \times 4}$$

$$B \quad \frac{7 \times 3}{9 \times 3} : \frac{9 \times 3}{16 \times 3} = \frac{16 \times 3}{16 \times 3}$$

$$49 : 47$$

- 66) Three vessel each of ~~10~~<sup>10</sup> litre capacity contain a mixture of milk & water in the ratio 2:1, 3:1 and 3:2 . if all the three vessels are emptied into a large vessel , find the ratio of milk & water in new mixture ?

$$A \quad m : w$$

$$2 \times 20 : 1 \times 20 = \frac{3 \times 20}{20}$$

$$B \quad 3 \times 15 : 1 \times 15 = \frac{4 \times 15}{15}$$

$$C \quad \frac{3 \times 12}{12} : \frac{2 \times 12}{59} = \frac{5 \times 12}{59}$$



- 67) Two vessel A & B contain a mixture of milk & water in the ratio 4:5 and 5:1 . In what ratio should quantities of mixture be taken ? If both vessel are mixed in the ratio 5:2 . find the ratio of milk & water in new mixture .

$$M : W$$

$$A \quad 4 \times 10 : 5 \times 10 = \frac{9 \times 2}{18 \times 5}$$

$$B \quad \frac{5 \times 6}{70} : \frac{1 \times 6}{56} = \frac{6 \times 3}{18 \times 2} \Rightarrow 5:4$$

(68) If 2 kg of metal of w/c  $\frac{1}{3}$  is zinc and rest is copper - 193

are mixed with 3 kg of metal of w/c  $\frac{1}{4}$  is zinc and rest is copper

What is the ratio of zinc to copper in new mixture.

$$\begin{array}{r} 2 \\ \times 8 \\ \hline A & 1 \times 8 & 2 \times 8 = 3 \times 4 = 12 \times 2 \end{array} \xrightarrow{2 \text{ kg}}$$

$$\begin{array}{r} 1 \times 9 \\ \hline B & \frac{1 \times 9}{17} : \frac{3 \times 9}{43} = 4 \times 3 = 12 \times 3 \end{array} \xrightarrow{3 \text{ kg}}$$

(69) Ratio of Land : water on earth is 1:2 and ratio of

Land : water in northern hemisphere is 2:3. find the ratio

of Land:water in southern hemisphere.

$$\begin{array}{r} L & W & \text{Earth} & \text{Earth} : 2 \\ \text{Earth} & 1 \times 10 : & 2 \times 10 = 3 \times 5 = 15 \times 2 & \text{NH} \rightarrow 1 \\ \text{NH} & \frac{2 \times 3}{4} : \frac{3 \times 3}{11} = 5 \times 3 = 15 \times 1 & \text{NH} & \text{Earth} : \text{NH} = 2 : 1 \\ \text{SH.} & 4 : 11 & & \end{array}$$

(70) Rs 5600 is to be divided among A, B, C & D in such a way that the ratio of share of A:B is 1:2, B:C is 3:1, C:D is 2:3. find share of (A+B)

$$\begin{array}{r} a : b : c : d \\ 1 : 2 & 2 & 2 \\ 3 & 3 & 1 & 1 \\ 2 & 2 & 2 & 3 \\ \hline 6 & 12 & 4 & 6 \\ 3 & 6 & 2 & 3 \end{array} \quad \begin{array}{l} 3+6+2+3=14 \\ 14 \longrightarrow 5600 \\ 1 \longrightarrow 400 \\ (A+B) = 9 \times 400 \\ = 3600 \text{ Rs.} \end{array}$$



(71) The ratio of expenditure of A, B and C is 16:12:9 and their total income is 1530. find the share of B's income. if they save 20%, 25% and 40% of their income?

$$\begin{array}{r} A & B & C & 51 \rightarrow 1530 & 20\% = \frac{1-5}{5} \rightarrow I \\ \text{Income} & 20 : & 16 : & 15 & 1 \rightarrow 30 \\ \text{Exp} \rightarrow & 16 : & 12 : & 9 & E = 4 \rightarrow 16 \\ & & & & \frac{1}{5} \rightarrow 4 \\ & & & & 5 \rightarrow 20 \end{array}$$

- (72) The total income of A, B & C is Rs 6060. A spend 85% of his income, B spend 85% and C spent 75%, and the ratio of their saving is 5:6:9. find the income of A ? 194

$$\begin{array}{ccccccc}
 & A & B & C & \text{Spend} = \frac{4+6}{5} = \frac{10}{5} & \text{Spend} = \frac{17}{20} \\
 & \text{Saving} & 5 : 6 : 9 & & \text{So } 1 \rightarrow 6 & S = 3 \rightarrow 6 \\
 & \text{Income} & 85 : 90 : 86 & & 1 \rightarrow 2 & 1 \rightarrow 2 \\
 & & & & 5 \rightarrow 25 & 20 \rightarrow 40 \\
 101 \rightarrow 6060 & & & & & A = 85 \times 60 = 1500 \text{ Rs.} \\
 1 \rightarrow 60 & & & & &
 \end{array}$$

- (73) Rs 2366 is divided among 8 men, 10 women & 10 children. Each men get 85% more than each woman and each woman get 85% more than each child. find the amount received by each woman.

$$\begin{array}{ccccc}
 m & w & c & 14 \rightarrow 2366 \\
 5 : & 4 & 4 & 1 \rightarrow 169 \\
 5 & s : & 4 & 5 \rightarrow 169 \times 5 = 845 \\
 \hline
 25 : & 20 : & 16 & & \\
 | \times 8 & | \times 10 & | \times 10 & \text{Each woman} = \frac{845}{10} = 84.5 \\
 200 : & 200 : & 160 & & \\
 5 & 5 & 4 & &
 \end{array}$$

- (74) Rs 500 is divided among A, B, C in such a way that Rs 16 more  $\frac{2}{5}$  of A's share, Rs 70 less than  $\frac{3}{4}$  of B's share, and Rs 4 less than  $\frac{3}{5}$  of C's share are equal. find B's share.

$$\begin{array}{ccccccc}
 Ax \frac{2}{5} + 16 & = & Bx \frac{3}{4} - 70 & = & Cx \frac{3}{5} - 4 & = & 6K \\
 A = (6K - 16) \times \frac{5}{2} & = & B = (6K + 70) \frac{4}{3} & = & C = (6K + 4) \frac{5}{3} & & \text{LCM of } 4, 3, 5 = 6 \\
 A = 15K - 40 & & = 8K + \frac{280}{3} & & = 10K + \frac{20}{3} & & \\
 \therefore 15K - 40 + 8K + \frac{280}{3} + 10K + \frac{20}{3} & = & 500 & & & & \\
 33K = 440 & & & & & & \\
 K = \frac{40}{3} & & & & & &
 \end{array}$$

$$\begin{array}{c}
 B = 8 \times \frac{40}{3} + \frac{280}{3} \\
 = \frac{600}{3} = 200 \text{ Rs}
 \end{array}$$

- (+) A boy and a girl playing with the pencil. The girl break the pencil in two parts and the boy observe that the ratio of length of these two parts is same as the ratio of length of pencil to the larger part. find the ratio in w/c the 195 girl break the pencil.



$$\frac{x}{1} = \frac{x+1}{x}$$

$$x^2 = x + 1$$

$$x^2 - x - 1 = 0$$

$$x = \frac{1+\sqrt{5}}{2} \Rightarrow \frac{\sqrt{5}+1}{2}$$

$$\therefore \text{Ratio of two parts} = \sqrt{5}+1 : 2$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{1 \pm \sqrt{5}}{2}$$

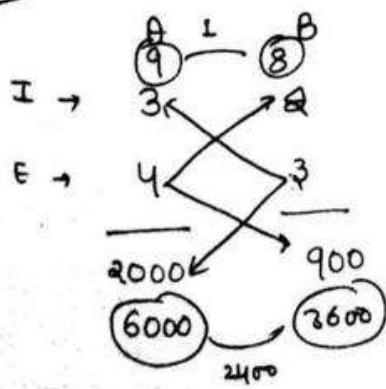
Ratio  
 $a:b$  नदी के  
 समान | & विविध  
 दो पार्टें,  
 Relation सम्बन्ध  
 दिया है।  
 So,  $x:1$  सम्भव  
 हो।



- (+) The ratio of income of A & B is 3:2 and ratio of their expenditure is 4:3. if they save Rs 2000 & Rs 900. find their income.

$A \quad B$ $I \rightarrow 3x : 2x$ $E \rightarrow 4 : 3$	$\frac{3x - 2000}{2x - 900} = \frac{4}{3}$ $9x - 6000 = 8x - 3600$ $x = 2400$	$A = 7200 \text{ Rs}$ $B = 4800 \text{ Rs.}$
---	---	---

OR



$$I \rightarrow 2400$$

$$3 \rightarrow 7200 \text{ (A's income)}$$

$$2 \rightarrow 4800 \text{ (B's income)}$$

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Ex) The ratio of total amount distributed in all the male & female is salary is 6:5 while the ratio of salary of each male & female is 2:3. Find the ratio of no. of male & female?

$$\begin{array}{r} m : w \\ \text{Ans. } 6 : 5 \\ \text{Ex. } 2 : 3 \\ \hline 3 : \frac{5}{3} \\ 9 : 5 \text{ Ans.} \end{array}$$



Ex) Rs. 430 is divided among 45 persons such that the ratio of amt received by all men, all women & all children are in the ratio 12:15:16. While the ratio of amount received by each man, each woman & each child is 6:5:4. Calculate the no. of men, women & child and also find the amount received by each of them.

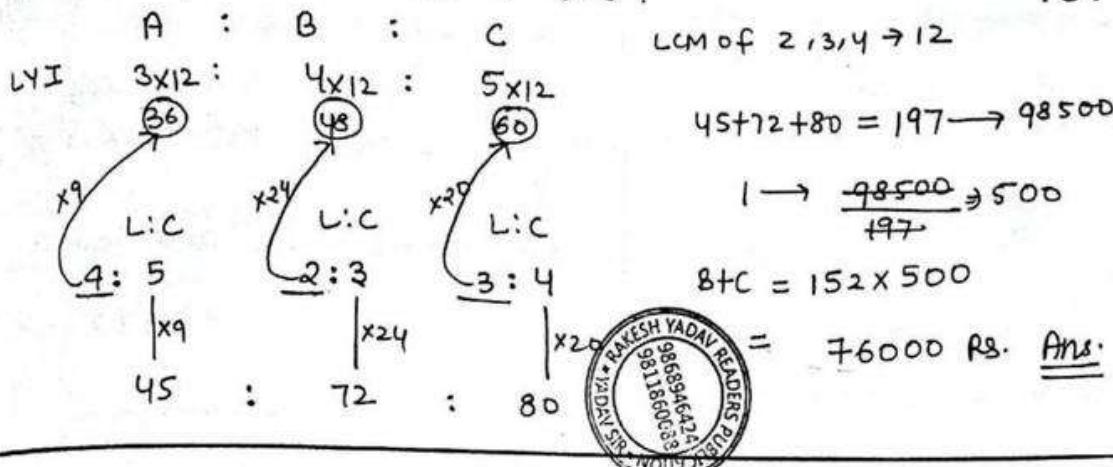
$$\begin{array}{r} m : w : c \\ \text{Ans. } 12 : 15 : 16 \\ \text{Ex. } 6 : 5 : 4 \\ \hline 6 : 5 : 4 \\ \text{Ans. } \frac{6}{5} : \frac{5}{5} : \frac{4}{5} \\ \text{Ex. } 12 : 15 : 16 \\ \hline 12+15+16 = 43 \rightarrow 430 \\ 1 \rightarrow 10 \\ \text{All man} = 120 \\ \text{Each man} = \frac{120}{10} = 12 \text{ Rs} \\ \text{All women} = 150 \\ \text{Each woman} = \frac{150}{15} = 10 \text{ Rs} \\ \text{All child} = 160 \\ \text{Each child} = \frac{160}{20} = 8 \text{ Rs.} \end{array}$$

Ex) Rs. 5625 is divided among A, B & C in such a way that a sum is the sum of B+C. Find the amount received by C if B receives  $\frac{1}{8}$  of (A+B).

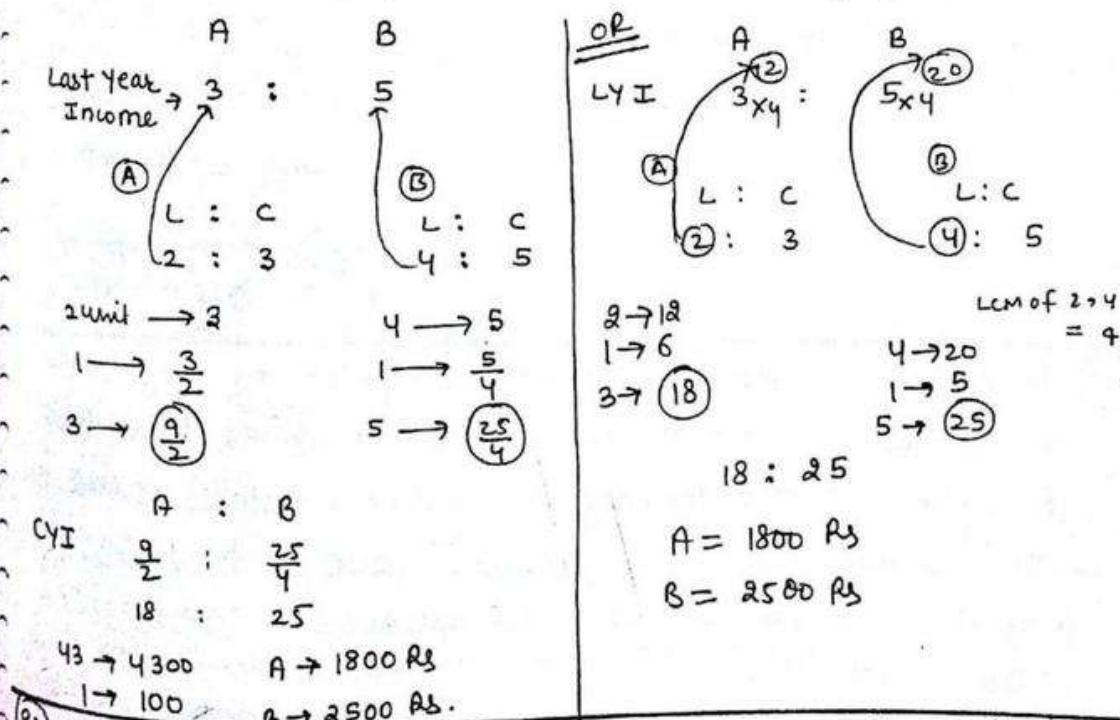
$$\begin{array}{l} \frac{A}{B+C} = \frac{1}{2} = \frac{5}{15} \quad A : B : C \\ \frac{B}{B+C} = \frac{1}{4} = \frac{3}{12} \quad 5 : 3 : 7 \\ \frac{C}{B+C} = \frac{1}{4} = \frac{3}{12} \quad \underline{A+B} \rightarrow \frac{375}{15} \times 8 = 3000 \text{ Rs} \end{array}$$

(80) The ratio of last year income of A, B & C is 3:4:5. while the ratio of their last year income to current year income 4:5, 2:3 and 3:4. if their total current year income is Rs 98500 find the present income of B+C.

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(81) one year ago the ratio of income of A & B is 3:5. The ratio of their LYI to CYI is 2:3 and 4:5. if their total CYI is Rs 4300. find their present income individually?



(82) Ratio of income of A, B, C is 3:7:4 and the ratio of their exp. is 4:3:5. if A saves  $14\frac{2}{7}\%$  of his income. find the ratio of their saving.

$$\begin{array}{l}
 A : B : C \\
 I \quad 3x : 7x : 4x \\
 E \quad 4y : 3y : 5y \\
 S \quad (3x-4y) : (7x-3y) : (4y-5y) \\
 14\frac{2}{7} : 1 = \frac{1}{7} : 1, E = 6 \\
 \frac{3x}{4y} = \frac{7}{6} \\
 \frac{x}{y} = \frac{14}{9} \\
 S = (42-36) : (98-27) : (56-45) \\
 6 : 71 : 11 \quad \underline{\text{Ans}}
 \end{array}$$

OP

I	7	A	196	B	112	C	4
E	6	$3x \times 7$	$4x \times 7$	$4x \times 7$	$4x \times 7$	$4x \times 7$	$\frac{1}{7}$
S	12	$4 \times 3 \times 6$	$3 \times 3 \times 6$	$5 \times 3 \times 6$	$90$	$198$	$I \rightarrow 7$ $E \rightarrow 6$

A का Income & Exp का ratio 7:6 करना

₹ 1

first convert in 1:1 and then in  
7:6

- 83) A dog chase a rabbit. The dog takes 6 leaps for every 7 leaps of the rabbit and the distance covered by rabbit in 6 leaps is equal to the distance covered by dog in 5 leaps. find the ratio of their speed.

$$\begin{array}{ll}
 \text{Dog} & \text{Rabbit} \\
 6 \text{ jump} & 7 \text{ jump} \\
 6 \times 6 & 7 \times 5 \\
 = 36 & : 35
 \end{array}$$

$$\begin{array}{ll}
 \text{Dog} & \text{Rabbit} \\
 5 \text{ jump} & = 6 \text{ jump} \\
 \cancel{6 m} & \cancel{5 m} \\
 (30) &
 \end{array}$$

- 84) A dog takes 7 jumps for every 10 jumps of the lion and a fox takes 12 jumps for every 10 jumps of the lion. And the distance covered by dog in 5 jumps, distance covered by lion in 15 jumps and the distance covered by fox in 20 jumps is equal. find the ratio of their speeds.

$$\begin{array}{lll}
 \text{Dog} & \text{lion} & \text{fox} \\
 7 & 10 & 12 \\
 \times 12 & \times 4 & \times 3 \\
 \hline
 84 & 40 & 36
 \end{array}$$

$$\begin{array}{lll}
 \text{Dog} = \text{lion} = \text{fox} \\
 5 \text{ jump} & 15 \text{ jump} & 20 \text{ jump} \\
 \cancel{12 m} & \cancel{4 m} & \cancel{3 m} \\
 (60) & &
 \end{array}$$

Ratio of the distance  
covered by two objects in  
same time is equal to the  
ratio of their speeds

D = ST

(85) The price of gold is directly proportional to square of its weight. A person broke down the gold in the ratio of 3:2:1 and sold, incurs a loss of Rs 4620. find the initial price of gold.

$$\text{initial weight} = 3+2+1 = 6$$

$$36-14 = 22 \text{ rs T loss}$$

$$\text{initial price} = 6^2 = 36$$

$$36 - 4620$$

$$\text{After breaking price} = 3^2 + 2^2 + 1^2 = 14$$

$$1 - 210$$

$$\text{Initial price} = 36 \times 210 = 7560 \text{ Rs. Ans.}$$

### CLASS

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(86) A is inversely proportional to the cube of B.

$$\text{if } A=3 \text{ then } B=2$$

$$\text{but if } A=\frac{8}{9} \text{ then } B=?$$

$$A \propto \frac{1}{B^3}$$

$$A = \frac{24}{B^3}$$

$$A = \frac{K}{B^3}$$

$$\frac{8}{9} = \frac{24}{B^3}$$

$$3 = \frac{K}{(2)^3}$$

$$B^3 = 27$$

$$K = 24$$

$$B = 3 \text{ Ans.}$$

BY:  
Fardeep Chhokker  
7206446517

(87) A bag contains 1Rs, 50P & 25P coins and the ratio of no. of coins is 5:7:9. If the total value of all coins is 430 Rs. Then

find the no. of 50P coins.

1Rs      50P      25P

No. of coins  $\Rightarrow$  5 : 7 : 9

Ratio of values  $\Rightarrow$  5Rs : 3.50Rs : 2.25Rs

$$10.75 \text{ Rs} \rightarrow 430$$

$$1 \rightarrow \frac{430}{10.75} = 40$$

$$\text{No. of } 50 \text{ P coins} = 7 \times 40 = 280$$

(88) A bag contains 1Rs, 50P & 25P coins and the ratio of their value is 30:11:7. and the total no. of coins are 480. find the no. of 50P coins.

1Rs      50P      25P

values  $\Rightarrow$  30 : 11 : 7

coins  $\Rightarrow$  30 : 22 : 28

$$80 \rightarrow 480$$

$$1 \rightarrow 6$$

$$\text{No. of } 50 \text{ P coins} = 22 \times 6 = 132 \text{ Ans.}$$

- 89) find the mean proportion of  $\frac{1}{4}$  &  $\frac{1}{9}$

$$\sqrt{\frac{1}{4} \times \frac{1}{9}} = \frac{1}{6}$$

mean proportion of  
a, b =  $\sqrt{ab}$

- 90) find the 3rd proportion of 18, 36.

$$\frac{36 \times 36^2}{18} = 72$$

200

- 91) find the 4th proportion of 12, 16, 18.

$$\frac{16 \times 18}{12} = 24$$

3rd proportion =  $\frac{b^2}{a}$

- 92) Rs 720 is divided among A, B & C in such a way that A receives Rs 40 more than B, C receives Rs 30 more than A. find the share of A.

A	B	C
$x+40$	$x$	$x+70$

$$A = 240 \text{ Rs}$$

$$3x + 110 = 720$$

$$3x = 600$$

$$x = 200$$



- 93) The ratio of age of Ram & Shyam 5 years ago was 2:3 and the ratio of their age after 5 years would be 3:4 find the sum of their present ages.

$R$ $\frac{-5}{\text{Present}} \rightarrow \frac{20}{25} : \frac{30}{35}$ $\frac{+5}{\text{1 unit}} : \frac{3}{4}$	$S$ $\frac{30}{35} : \frac{35}{40}$ $\frac{1}{1 \text{ unit}} : \frac{10}{10}$
--	--

$$25 + 35 = 60$$

Ans.

- 94) The ratio of ages of Ram & Shyam 5 years ago was 3:1 the ratio of their age after 5 years will be 2:1. find the present age of both.

$R$ $\frac{-5}{P} \rightarrow \frac{30}{25} : \frac{10}{15}$ $\frac{+5}{2 \text{ units}} : \frac{1}{1 \text{ unit}}$	$S$ $\frac{30}{25} : \frac{10}{15}$ $\frac{3-1=2}{2-1=1} : \frac{1}{1}$
--	---

→ दोनों की आयु का अंतर समान करने के लिए

Present age of Ram = 35

Present age of Shyam = 15

- (25) The age of Ram is 4 times of his daughter. The age of 201 Ram was 9 times of her daughter five years ago. - find their present ages.

$$\begin{array}{r}
 R = 32 \\
 D = 8 \\
 \hline
 P \rightarrow 4 \frac{R}{D} = 4 \frac{32}{8} = 4
 \end{array}$$

पानों की आय का अल्प समावयव करने के लिए पहले दोनों का अल्प तो लेते हैं फिर cross multiply कर देते हैं।

Ram = 32 years

daughter = 8 years.

- (26) The age of father is 3 times of his son. 5 years before the age of son was  $\frac{1}{2}$  times of his father. find the present age of son. at the time of <sup>marriage of</sup> his mother, he was 5 years younger to his father. find the age of mother.

$$\begin{array}{r}
 F = 25 \\
 S = 5 \\
 \hline
 P \rightarrow 6S : 1F = 6S : 25 \\
 5y \quad \quad \quad 1S : 25 \\
 \hline
 3S : 25 = 2 \\
 3S = 50 \\
 S = \frac{50}{3} = 16\frac{2}{3}
 \end{array}$$



Present age of father  
= 25

Present age of son =  $\frac{5 \times 25}{3} = \frac{125}{3} = 41\frac{2}{3}$

Mother's age  $\rightarrow 25 - 5 = 20$

- (27) The ratio of age of Meena & her mother is 3:8. find the ratio of their age after 4 years if after 10 years their age diff will be 35 years.

$$\begin{array}{r}
 M \quad \text{Mother} \\
 3 : 8 \\
 \hline
 5 \rightarrow 35 \\
 1 \rightarrow 7
 \end{array}$$

$$\begin{array}{r}
 21 : 56 \\
 (+4) +4 \\
 25 : 60 \\
 5 : 12
 \end{array}$$

## PARTNERSHIP

- Q9) A & B are two partners start a business by investing a capital 25,000 Rs and 35,000 Rs. and decide to share their profit acc. to their capital. But C joins the business on a condition that they will distribute the profit equally (1:1:1) and for that C gives 2,20,000 to A & B. find in w/c ratio A & B will distribute that amount.

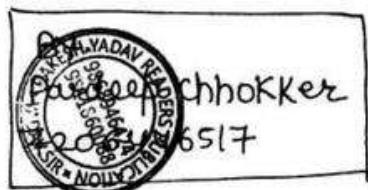
$$\begin{array}{ccc}
 A : B & C & 25000 : 35000 \\
 5 : 7 & & 5 : 7 \\
 \frac{5}{4} : \frac{7}{4} & : 4 & \text{profit} = 12 \\
 \hline
 \frac{1}{4} : \frac{3}{4} & & \begin{array}{c} 5 \\ \swarrow \quad \searrow \\ A \quad B \end{array} \\
 \text{A का रेस} & & \begin{array}{c} 12 \\ \swarrow \quad \searrow \\ 4 \quad 4 \quad 4 \end{array} \\
 & & \frac{1}{4} + \frac{3}{4} \text{ गया } C \text{ के पास} \\
 & & 220,000 \\
 & & \begin{array}{c} 1 : 3 \\ \swarrow \quad \searrow \\ 55,000 \quad 1.65,000 \end{array} \quad \text{RAMESH YADAV} \\
 \hline
 \end{array}$$

- Q9) A & B start a partnership with Rs 1500 and Rs 2000. After 4 months C also joins the business with Rs 2250. If B withdraw his capital after 9 months then find the share of profit of B in a total profit of Rs 900.

A	B	C	
$1500 \times 12$	$2000 \times 9$	$2250 \times 8$	$3 \rightarrow 900$
1800	1800	1800	$1 \rightarrow 300$
<hr/>	<hr/>	<hr/>	$B \rightarrow 300$
1 : 1 : 1			

- Q10) A & B start a business with Rs 50 and Rs 45. After 4 months A withdraw half of his capital and B withdraw half capital after 6 months and C joins the business with a capital of Rs 70 after 6 months. find the profit sharing ratio.

$$\begin{array}{r}
 A \quad B \quad C \\
 50 \times 4 \quad 45 \times 6 \quad 70 \times 6 \\
 25 \times 8 \quad 22.50 \times 6 \\
 \hline
 400 \quad 405 \quad 420 \\
 80 : \quad 81 : \quad 84
 \end{array}$$



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- (101) A & B start a business with Rs 16000 and 15000. After 3 months A withdraw Rs 5000 and B invest Rs 5000 more. C joined the business with Rs 21000 next after 3 months. If the total profit is 24900, find the share of C.

$$\begin{array}{r}
 A \quad B \quad C \\
 16000 \times 3 \quad 15000 \times 3 \quad 21000 \times 6 \\
 11000 \times 9 \quad 20000 \times 9 \\
 \hline
 147 : \quad 225 : \quad 126
 \end{array}
 \text{C} = 126 \times 50 = 6300 \text{ Rs}$$



- (102) A invest  $\frac{1}{6}$  part of total capital for  $\frac{1}{6}$  time. B invest  $\frac{1}{3}$  part of total capital for  $\frac{1}{3}$  time and C invest the rest capital for full time. If the total profit is Rs 23000, find the share of B.

$$\begin{array}{r}
 \text{Total capital} = 6 \quad A \quad B \quad C \\
 1 \times 2 \quad 2 \times 4 \quad 3 \times 12 \\
 \frac{1}{6} \quad \frac{1}{3} \\
 \frac{1}{6} + \frac{1}{3} = \frac{1}{2} \quad 2 : \quad 8 : \quad 36 \\
 2 \times \frac{1}{2} = 1 \quad 1 : \quad 4 : \quad 18
 \end{array}
 \left| \begin{array}{l}
 23 \rightarrow 23,000 \\
 1 \rightarrow 1000 \\
 B = 4000
 \end{array} \right.$$

- (103) A & B start a business, A invest  $\frac{1}{4}$  capital for  $\frac{1}{4}$  th time and B invest  $\frac{1}{5}$  th capital for  $\frac{1}{2}$  time and C invest the remaining capital for full time. How should they divide a profit of Rs 1140.

$$\begin{array}{r}
 A \quad B \quad C \\
 5 \times 3_1 \quad 4 \times 6_2 \quad 11 \times 12_4 \\
 5 : \quad 8 : \quad 44
 \end{array}
 \left| \begin{array}{l}
 57 \rightarrow 1140 \\
 1 \rightarrow 20 \\
 A \rightarrow 100 \\
 B \rightarrow 160 \\
 C \rightarrow 880
 \end{array} \right.
 \text{Ans}$$

$\therefore \frac{1}{4} \quad \frac{1}{5}$   
 Capital = LCM of 4, 5  
 = 20

- (104) A, B, C start a business by investing the capital in 5:6:8. At the end of the business they receive the profit in the ratio of 5:3:12. find the ratio of time for w/c they contribute their capital ?

	A	:	B	C
P	5		3	12
C	5		6	8
T	$\frac{1}{2} \times 2$		$\frac{1}{2} \times 2$	$\frac{3}{2} \times 2$
	2	:	1	3

Ans.

$$P = C \times T$$

$$T = \frac{P}{C}$$

$$C = \frac{P}{T}$$

- (105) A, B, C start a business, A invest money for 4 months & claim  $\frac{1}{8}$  of the total profit & B invest money for 6 months & claim  $\frac{1}{3}$  of the profit while C invest Rs 1560 for 8 months. How much money A & B invest ?

P	A	B	C		$\frac{1}{8}$	$\frac{1}{3}$
T	3	8	13			
C	$\frac{3}{4} \times 24$	$\frac{4}{3} \times 24$	$\frac{13}{8} \times 24$		$P = 24$ (L.C.M.) (of 8, 3)	
	18	32	39		$39 \rightarrow 1560$	
					$1 \rightarrow 40$	
					$A \rightarrow 18 \times 40 = 720$	
					$B \rightarrow 32 \times 40 = 1280$	

- (106) A & B rent a pasture for 10 months. A puts in 100 cows for 8 months. How many cows can B put in for the remaining two months if he pays  $\frac{3}{2}$  as much as A.

$$A = 100 \times 8 = 800$$

$$B = \frac{C \times 2}{3}$$

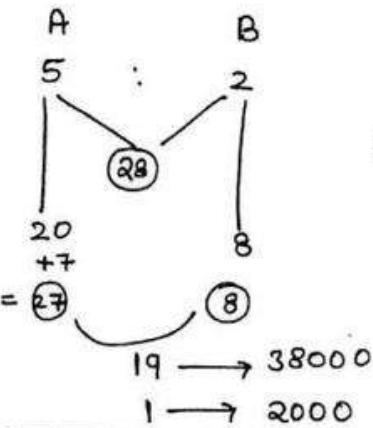
$$25 \quad 100 \times 8 \times 3 = C \times 2 \times 2$$

$$C = 600$$

$$B = A \times \frac{3}{2}$$

$$\frac{B}{A} = \frac{3}{2}$$

- (107) A & B start a business with 50,000 & 20,000 Rs. If A 20% as his salary and remaining profit is divided acc. to their capital. If in this process A received Rs 38000 more than B. find the amount of total profit?



$$A = \frac{5}{7} \times 28 = 20$$

$$B = \frac{2}{7} \times 28 = 8$$

$$20\% = \frac{1}{5}$$

$$T.P = 5 \times 7$$

$$A's \text{ salary} = 1 \times 7$$

Profit to be distributed  
=  $4 \times 7$  — Multiply by 7  
so that fraction  
 $\pi \sqrt{7}/1$

$$\text{Total Profit} = 35 = 35 \times 2000$$

$$= 70000 \text{ Rs } \underline{\underline{\text{Any}}}$$

- (108) A, B, C are three partners with a capital 8,00,000, 12,00,000, 15,00,000 and they decide to share their profit acc to the ratio of their capital. But A is working partner and takes  $12\frac{1}{2}\%$  of total profit as salary. If A receives Rs 5200 from the business. find the amount of total profit?

A	B	C
8 :	12 :	15
$\frac{8}{35} \times 35$	$\frac{12}{35} \times 35$	$\frac{15}{35} \times 35$
8	12	15
+5		
13		



$$12\frac{1}{2}\% = \frac{1 \times 5}{8 \times 5} \text{ A's salary}$$

$$\text{distributed P} = 7 \times 5$$

$$13 \rightarrow 5200$$

$$1 \rightarrow 400$$

$$\text{Total Profit} = 40 \times 400 = 16000 \text{ Rs}$$

- (109) A & B are two partners with capital 50,000 & 70,000 and agreed that 70% of the total profit should be divided equally b/w them and the remaining profit in the ratio of their capital. If one partner gets Rs 90 more than other find the total profit?

(115) A & B started a business with a capital of Rs 32,000 & Rs 56,000 & decide to share their profit acc. to their capital. But C join the business on a condition that they will ~~divide~~ share the profit equally & for that C gives 2,20,000 to A & B. Then find in what ratio A & B will distribute that amount.

A : B : C

4 : 7

$$\begin{array}{r} \frac{11}{3} \\ \hline \frac{1}{3} \\ \hline 1 : 10 \end{array}$$

$$\frac{32000}{4} : \frac{56000}{7}$$

$$P = 11$$

$$\text{After C join} = \frac{11}{3} = P$$

$$\begin{array}{l} \textcircled{A} \quad 4 - \frac{11}{3} \\ = \frac{1}{3} \\ \downarrow \\ \text{less of A} \end{array}$$

$$\begin{array}{l} \textcircled{B} \quad 7 - \frac{11}{3} \\ = \frac{10}{3} \\ \downarrow \\ \text{less of B} \end{array}$$

$$\begin{array}{c} 2,20,000 \\ A \swarrow \searrow B \\ 20,000 : 200,000 \end{array}$$



$$\begin{array}{l} 11 \rightarrow 2,20,000 \\ 1 \rightarrow 20,000 \end{array}$$