GENERAL APTITUDE

Trainer : Sujata Mohite
sujata.mohite@sunbeaminfo.com

Todays topics

1. Mixtures & Alligation
2. Profit & Loss
3. Ratio & Proportion
4. Percentage

Mixtures & Alligation

- **Alligation** : It is the rule which enables us to find the ratio in which two or more ingredients at given prices must be mixed to produce a mixture of a desired price.(mixing / linking)
- **Mean Price** : The cost price of a unit quantity of mixture is called the mean price.
- **Dearer** : The more expensive ingredient

- Note :

Always maintain the order in which problem is given else answer gets changed

Mixtures & Alligation

Type 1 oranges at Rs.60 per kg and Type 2 oranges at Rs.120 per kg and when mixed cost is Rs.75 per kg. Find the ratio in which Type 1 and Type 2 oranges are mixed.

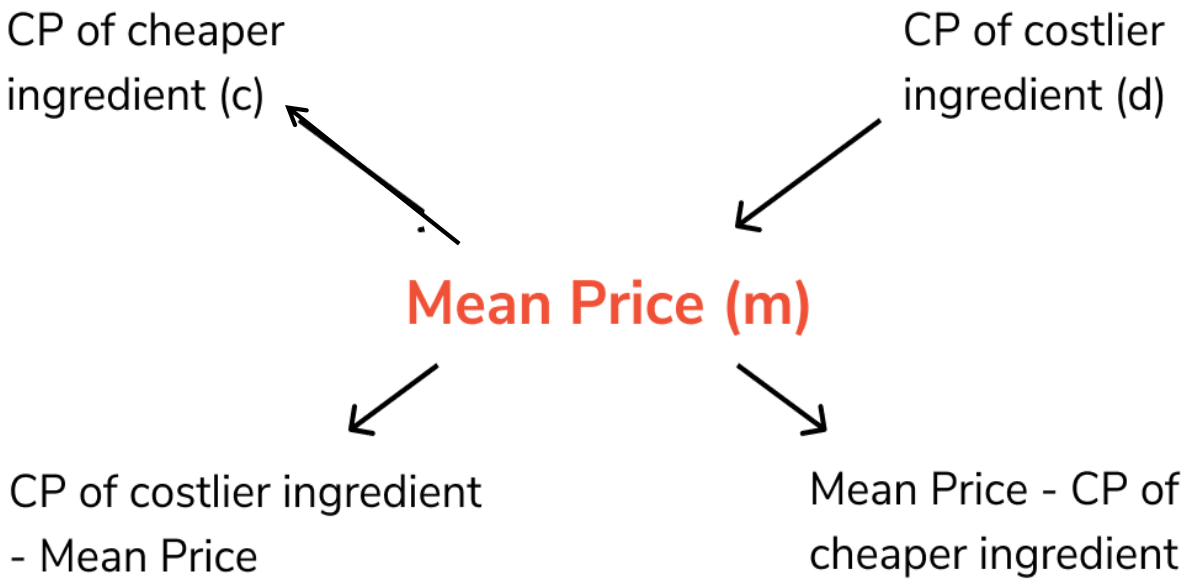
Soln:

Type 1 60 Type 2 120

75

x = d-m y =m-c

$$\frac{x}{y} = \frac{d-m}{m-c} = \frac{120-75}{75-60} = \frac{45}{15} = \frac{3}{1} = 3:1$$



$$\frac{\text{Quantity of cheaper ingredient}}{\text{Quantity of costlier ingredient}} = \frac{d - m}{m - c}$$

Mixtures & Alligation

Q1. In a 729 litres mixture of acid and water, the ratio of acid to water is 7 : 2. to get a new mixture containing acid and water in the ratio 7 : 3, the amount of water to be added is:

A. 81 litres

B. 71 litres

C. 56 litres

D. 50 litres

Ans: A

Mixtures & Alligation

Q.2 Two types of rice costing Rs. 180/kg and Rs. 280/kg. In what ratio should these be mixed so that obtained mixture sold at Rs.240/kg to earn a gain of 20% is ?

A. 4 : 1 B. 1 : 4 C. 1 : 13 D. 2 : 13

Ans: A

- Mean price is always CP
- Steps-
- 1. m=?
- 2. m = cost price(CP)
- 3. SP = given
- 4. find x/y=?

In case of profit, $SP = \frac{C.P. \times (100 + \%gain)}{100}$

Mixtures & Alligation

Q3. A trader has 50 kg of pulses, part of which he sells at 14% gain and rest at 6% loss. On the whole his loss is 4%. How much quantity is sold at 14% gain and that at 6% loss?

A. 15kg,35kg.

B. 5kg,45kg.

C. 10kg,40kg.

D. 45kg,5kg.

E. 40kg,10kg

Ans: B

Mixtures & Alligation

- **Final concentration = Initial $(1-\frac{R}{Initial})^n$**

- where,
- Final concentration is the amount of concentration remaining after the process
- n is the number of times the process is done and
- R is the replaced quantity.
- Initial is the initial concentration

Mixtures & Alligation

Q4. A container contains 25 lit of milk. From this container, 5 lit of milk is taken out and replaced by water. This process is further repeated two times. How much milk is there in the container now?

A. 11.5 lit

B. 14.8 lit

C. 13.5 lit

D. 12.8 lit

Ans: D

Mixtures & Alligation

Q.5 Acid and water in two vessels A and B are in the ratio 5 : 3 and 5 : 4 respectively. In what ratio, the liquid of both the vessels be mixed to obtain a new mixture in vessel C in the ratio 7 : 5?

A. 2 : 3

B. 3 : 2

C. 3 : 5

D. 5 : 3

Ans: A

For these type of questions consider 1 ingredient out of the two ingredients and represent as fraction of one.

Profit & Loss

- **Basics**

Profit (Gain) = (S.P – C.P)

Loss =(C.P – S.P)

% gain = (Gain / C.P) x 100

% loss = (Loss / C.P) x 100

- **Multipliers to find S.P**

In Case of Profit : S.P. = C.P. x **(100 +%gain)/100**

In Case of Loss : S.P. = C.P. x **(100 - %loss)/100**

i.e For sale at 25% profit S.P. = 125 % of C.P.

For sale at 25% loss S.P. = 75% of C.P.

Profit & Loss

Q6. A trader sells one capacitor for Rs. 840 at a gain of 20% and another for Rs. 960 at a loss of 4%. His total gain or loss percent is:

A. 5 15/17% loss

B. 5 15/17% gain

C. 6 2/3% gain

D. 6 2/3% loss

E. None of these

Ans: B

Profit & Loss

- **Two Different Articles Sold at same SP**

Article1 → SP Rs S → % gain or % loss = x%

Article2 → SP Rs S → % gain or % loss = y%

Overall % gain/loss = $\frac{(100 + x)y + (100 + y)x}{(100 + x) + (100 + y)}$

When x = y

Overall % loss = $-(x/10)^2$

Profit & Loss

Q7. A man sold two tables at Rs. 1200 each. On one he gained 20% and on the other he loss 20%. His gain or loss in the whole transaction is:

A. 1% loss

B. 2% loss

C. 4% loss

D. 15 gain

Ans: C

Profit & Loss

Q8. A vendor bought coffee pack at 6 for a rupee. How many for a rupee must he sell to gain 20%?

A. 3

B. 4

C. 5

D. 6

Ans: C

Profit & Loss

Q9. A shopkeeper mixes 26 kg of wheat at Rs.20 per kg with 30 kg of wheat of other variety at Rs.36 per kg and sells the mixture at Rs.30 per kg. His profit percent is:

A. 5%

B. 10%

C. 8%

D. None of these

Ans: A

Profit & Loss

Q10. A bookseller obtains 40 pens for Rs. 3200 and sells them at a profit equal to the selling price of 8 pens. What is the selling price of one dozen pens, if the price of each pen is same?

A. Rs. 720

B. Rs. 960

C. Rs. 1200

D. Rs. 1440

Ans: C

Profit & Loss

- Merchant, while selling goods, add certain percentage on the cost price. This addition is called percentage mark up, and the price thus obtained is called as marked price.
- The operative relationship is:
- CP + Mark Up = Marked Price
- CP + %Mark Up on CP = Marked Price
- **Marked Price - % discount = Selling Price**

Profit & Loss

Q11. A dealer buys an article marked at Rs. 25,000 with 20% and 5% off. He spends Rs. 1,000 for its repairs and sells it for Rs. 25,000. What is his gain or loss percent?

A. 25% loss

B. 25% gain

C. 10% gain

D. 10% loss

Ans: B

Profit & Loss

Q12. A shopkeeper marks up the price of an item by 50% above the cost price and then offers a discount of 20% on the marked price. What is the overall profit percentage?

A. 20%

B. 25%

C. 30%

D. 40%

Ans: A

CP + %Mark Up on CP = Marked Price

Marked Price - % discount = Selling Price

Percentage

- Percentage is a fraction whose denominator is 100(per 100)

Fraction x100	% ÷100	Fraction	%
3/4	75%	5/4	125%
4/5	80%	3/2	150%
2/3	66.66 %	1/16	6.25%
5/6	83.33 %		
6/5	120%		

Fraction	%	Fraction	%	Fraction	%
1/1	100%	1/6	16.66 %	1/11	9.09 %
1/2	50%	1/7	14.28 %	1/12	8.33 %
1/3	33.33 %	1/8	12.5 %	1/13	7.69 %
1/4	25%	1/9	11.11 %	1/14	7.14 %
1/5	20%	1/10	10%	1/15	6.66 %

Percentage

Q. x is 83.33% of y. So y is ____% of x

Solution:

$x = 83.33y$

$x = \frac{5}{6} y$

So, $y = \frac{6}{5} x$

y = 120% (from chart)

Fraction x100	% 100	Fraction	%
3/4	75%	5/4	125%
4/5	80%	3/2	150%
2/3	66.66 %	1/16	6.25%
5/6	83.33 %		
6/5	120%		

Percentage

Q13. A student has to score 40% marks for passing the examination. If he gets 178 marks, he fails by 22 marks, find the maximum marks.

A. 500

B. 300

C. 100

D. 150

Ans: A

Number System

Q14. The sum of two numbers is 25 and their HCF and LCM are 3 and 105 respectively. Find the sum of the reciprocal of the two numbers.

A. 5/36 B. 6/35 C. 5/63 D. 3/56

Ans: C

- Product of two given numbers is equal to the product of their HCF & LCM

  A x B = HCF(A,B) x LCM(A,B)

Percentage

Q15. If A's salary is 20% more than B's salary, by what percentage is B's salary less than A's?

A. 16.67%

B. 20.4%

C. 25.6%

D. 18.9%

Ans: A

Percentage

Q16.A population of a town increases by 10% in the first year and decreases by 10% in the second year. What is the net percentage change in the population after two years?

A. 2% decrease

B. 0%

C. 1% increase

D. 1% decrease

Ans: D

If a number is increased / decreased by x% then there is always a loss of $-(x/10)^2$

Percentage

- **Two Step change of Percentage**

  In first step if number is changed by a% and the result is again changed by b% the net percentage change of original number is given by

  Net % Change in Number = a + b + ab/100 (+ve or –ve)

Percentage

Q. If a number is increased by 12 % & then decreased by 18% then the net % change in number is

Soln:

Net % Change in Number = a + b + ab/100 (+ve or –ve)

% Change = 12 – 18 + (12 x -18)/100

= -6 – 2.16

= - 8.16%

Ratio & Proportion

- **Ratio** : Ratio is a comparison of two numbers (quantities) by division.
- The ratio of a to b is written as
- **a : b = a/b = a ÷ b.**

* Ratio is defined only for two values of same units

  ratio between 20 kg & 50 kg is 2:5

Ratio & Proportion

- **Some Useful Results**
- **If a:b = c:d or a/b = c/d**

1. **a x d = b x c**
2. **b/a = d/c** (Invertendo)
3. **a/c = b/d** (Alternendo)
4. **a+b/b = c+d/d** (By Componendo)
5. **a-b/b = c-d/d** (By Dividendo)
6. **(a+b)/(a-b) = (c+d)/(c-d)** (By Componendo & Dividendo)

Ratio & Proportion

- **Proportion** : A proportion is an expression that states that two ratios are equal.

  i.e. **a : b = c : d** e.g **2 : 3 = 4 : 6** or **2 : 3 :: 4 : 6**

  a, b, c & d are called the 1st, 2nd, 3rd & 4th proportional.

  1st & 4th proportionals are called extreme terms &

  2nd & 3rd proportionals are called mean terms.

  Product of means = Product of extremes. **bc = ad**

- **Continued Proportion**

  Three quantities are said to be in continued proportion if

  a : b = b : c or a/b = b/c

  If a : b :: b : c then $b^2 = ac$ (b is the mean proportion of a & c)

  a : b = b : c = c : d or a/b = b/c = c/d

Ratio & Proportion

Q17. The incomes of A and B are in the ratio 5:4, and their expenses are in the ratio 3:2. If each saves ₹1600, what is A's income?

A. ₹3400

B. ₹4400

C. ₹4000

D. ₹3600

Ans: C

Ratio & Proportion

Q18. A sum of ₹680 is divided among A, B, and C in such a way that A gets 2/3 of what B gets, and B gets 1/4 of what C gets. How much money does C get?

A. ₹480

B. ₹360

C. ₹120

D. ₹180

Ans: A

Ratio & Proportion

Q19. A certain sum is divided between A, B, C and D such that the ratio of the shares of A and B is 1 : 3, that of B and C is 2 : 5, and that of C and D 2 : 3. If the difference the shares of A and C is Rs. 3,510, Find the share of D.

A. Rs.4,320

B. Rs.3,240

C. Rs.6,075

D. Rs.4,050

Ans: C

Ratio & Proportion

Q20. Two numbers are in ratio 13: 9 and their HCF is 13. Find the largest number.

A. 169

B. 117

C. 52

D. 143

Ans: A


THANK
YOU!