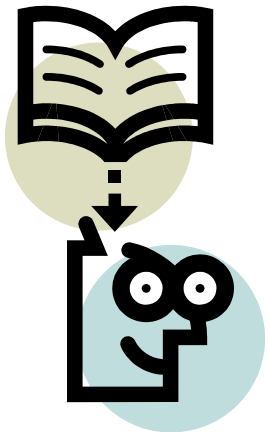

GENERAL APTITUDE

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Averages(test)

Q. The average age of a class of 49 students is 16 years. A new student joins the class as a result of which the average increases by 0.5. How old is the new student?

A. 16.5years B. 18 years C. 32 years D. 41 years

Ans : D

Ages(test)

Q. The age of father 10 years ago was thrice the age of his son. Ten years hence, father's age will be twice that of his son. The ratio of their present ages is:

A. 5:2 B. 7:3 C. 9:2 D. 13:4

Ans : B

Ratio & Proportion(Test)

Q. The incomes of A & B are in the ratio 3:2. Their respective expenditures are in the ratio 5:3. If each of them saves Rs. 2,000, what is the income of B?

A. Rs 12,000 B. Rs 8,000 C. Rs 16,000 D. Rs 6,000

Ans : B

Ratio & Proportion(Test)

Q. Between two stations I, II and III class fares were in the ratio 9:7:2. The passengers traveling in a day are in the ratio 5:3:2 respectively in the above classes. The total revenue from sale of tickets is Rs 98,000 that day. If 200 passengers travelled by III Class, the first class fare is

A. Rs 150 B. Rs 125 C. Rs 126 D. Rs 128

Ans : C

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.
- **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

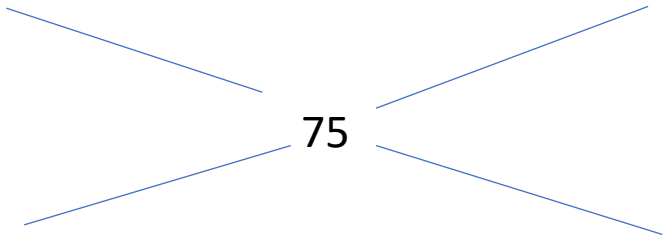
Alligation

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:

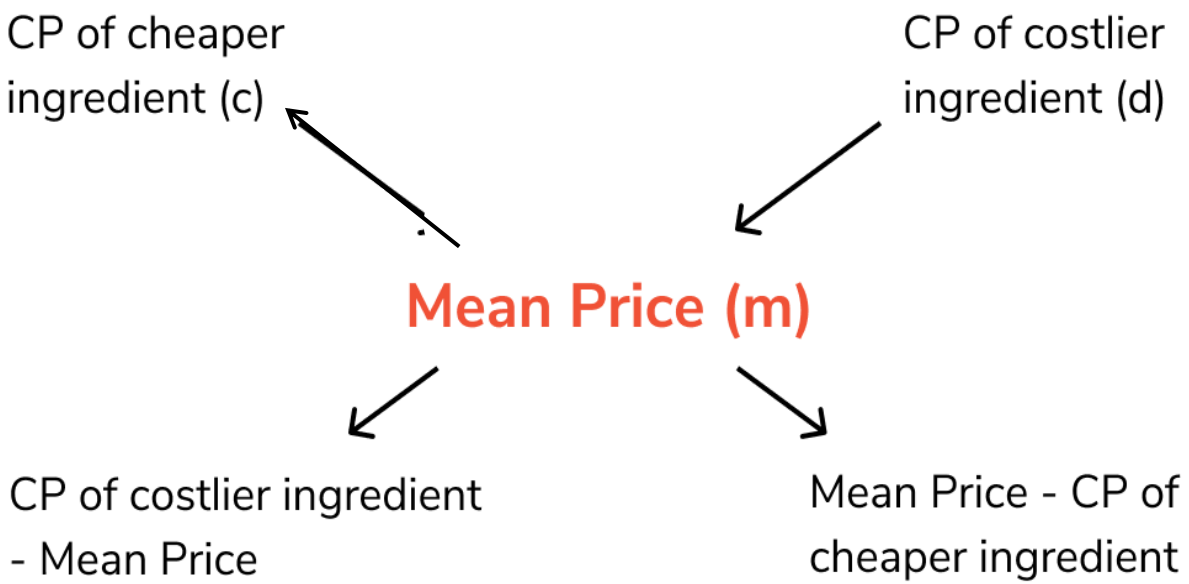
Type 1 Type 2

60 120



x = d-m y =m-c

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



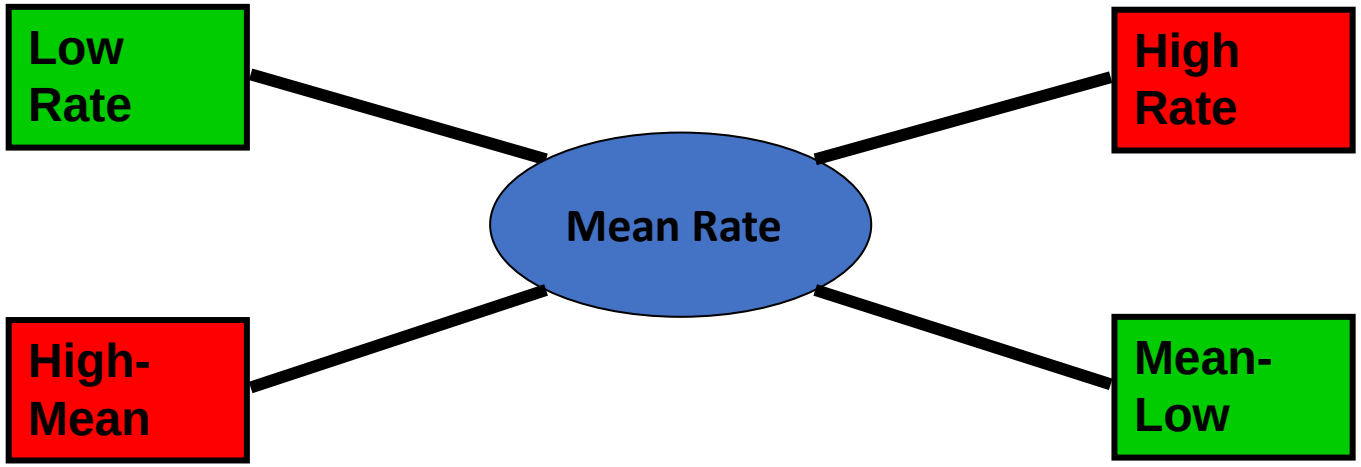
$$\frac{\text{Quantity of cheaper ingredient}}{\text{Quantity of costlier ingredient}} = \frac{d - m}{m - c}$$

Alligation

Quantity of Lower = (C.P. of Higher) – (Mean Price)
Quantity of Higher (Mean Price) – (C.P. of Lower)

$$\frac{\mathbf{Q}l}{\mathbf{Q}h} = \frac{\mathbf{CP}h - \mathbf{CP}m}{\mathbf{CP}m - \mathbf{CP}l}$$

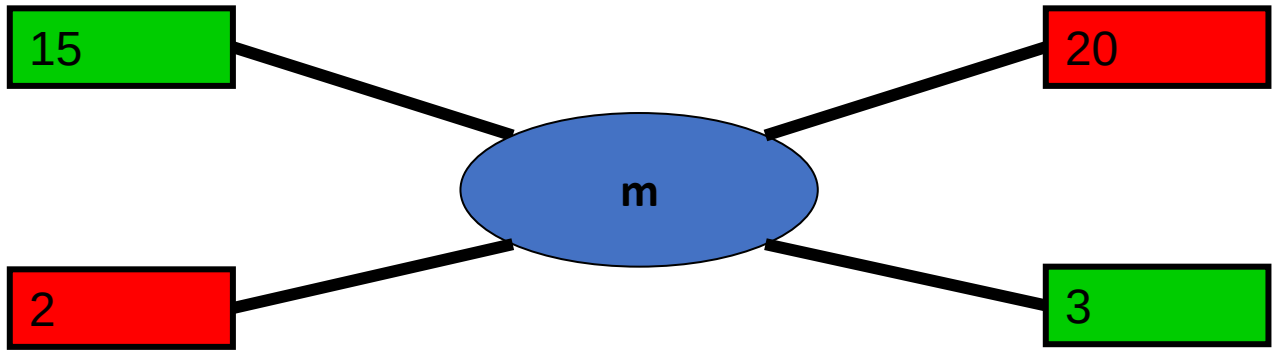
(**Qty** Low) : (**Qty** High) = (**CP**h-**CP**m) : (**CP**m-**CP**l)



Alligation

Q. CP of rice A is Rs. 15/kg and CP of rice B is Rs.20/kg. If both A and B are mixed in the ratio 2:3. Then find the price per kg of the mixed rice.

Soln:



$\frac{x}{y} = \frac{d-m}{m-c}$

$\frac{2}{3} = \frac{20-m}{m-15}$

m= $\frac{90}{5}$ = 18Rs.

Alligation

Q. In what ratio must a grocer mix two varieties of dal worth Rs. 60/kg & Rs. 65/kg, so that selling the mixture at 68.20/kg, he may gain 10%.

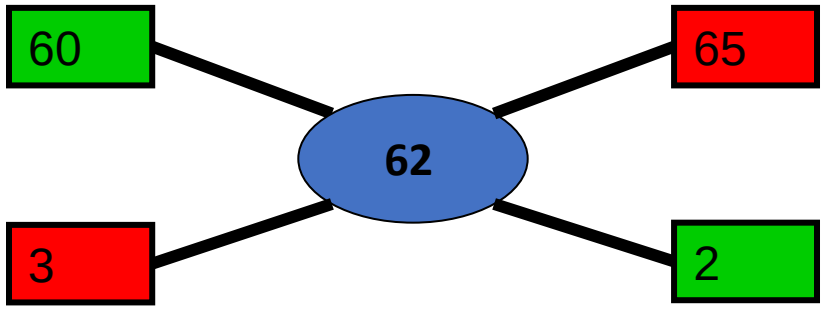
Soln:

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

Alligation

In what ratio must a grocer mix two varieties of dal worth Rs. 60/kg & Rs. 65/kg, so that selling the mixture at 68.20/kg, he may gain 10%.

- SP of 1 kg of mixture = Rs. 68.20
- Gain =10%
- In case of profit, $SP = \frac{C.P. \times (100 + \%gain)}{100}$
- CP of 1kg of mixture = Rs $(\frac{100}{100+10} \times 68.2)$
- $= \frac{682}{11}$
- Mean price =Rs. 62
- By the rule of alligation, we have :
- C.P. of 1kg dal of 1st kind C.P. of 1kg dal of 2nd kind

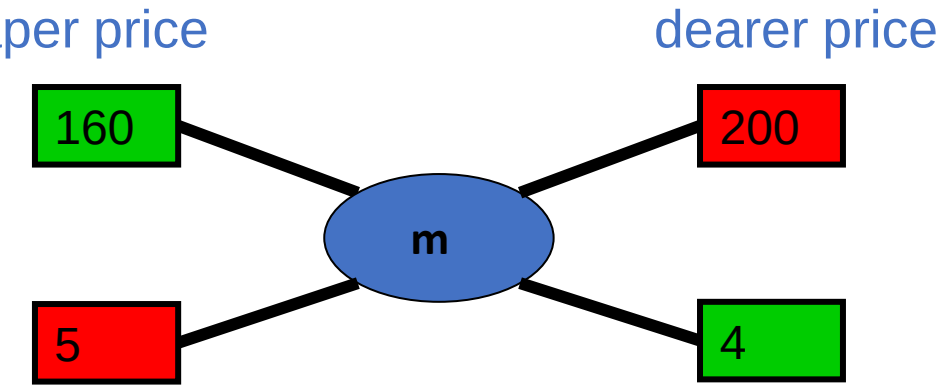


x/y = 3/2= 3:2

Alligation

Q. A person blends two varieties of tea , one cost Rs. 160/kg and other cost Rs. 200/kg in the ratio 5 : 4. He sells the blended variety at Rs.192/kg. Find the profit %.

Soln :



$\frac{x}{y} = \frac{d-m}{m-c}$

$\frac{5}{4} = \frac{200-m}{m-160}$

5m -800 = 800 -4m

9m = 1600

m = $\frac{1600}{9}$

SP=Rs.192(given) , CP =mean price

Profit% = $\frac{SP-CP}{CP}$ x 100

$= \frac{192 - \frac{1600}{9}}{\frac{1600}{9}} = \frac{1728 - 1600}{1600} = \frac{128}{16} = 8\%$

Alligation

Q. Two jars A and B contain milk and water in the ratio 7:5 and 17:7 respectively. In what ratio mixtures from two vessels should be mixed to get a new mixture containing milk and water in the ratio 5:3?

Soln:

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

A	B
m:w	m:w
7:5	17:7

C

m:w

5:3

We consider milk here, so fraction of milk,

A	B
$\frac{7}{7+5} = \frac{7}{12}$	$\frac{17}{17+7} = \frac{17}{24}$

C

$\frac{5}{5+3} = \frac{5}{8}$

To make calculations easier, convert all denominator into common one

So, find LCM(12,24,8) = 24

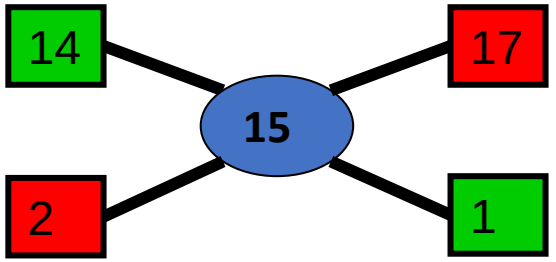
A	B
$\frac{7}{12} \times \frac{2}{2} = \frac{14}{24}$	$\frac{17}{24}$

C

$\frac{5}{8} \times \frac{3}{3} = \frac{15}{24}$

forget denominators,

By rule of Alligation,



2:1

Alligation(Assignment)

Q. Two solutions have milk : water ratio of 2:3 and 4:5. In what ratio must they be mixed such that the resultant solution has milk : water ratio of 3:4?

A. 8:3 B. 3:8 C. 5:9 D. 9:5

Ans : C

Alligation(Assignment)

Q. In what ratio rice at Rs. 9.30/kg be mixed with rice at Rs. 10.80/kg. So that the mixture be worth Rs. 10/kg.

A. 6:5 B. 8:7 C. 3:7 D. 6:1

Ans : B

Alligation(Assignment)

Q. The ratio, in which tea costing Rs. 192 per kg is to be mixed with tea costing Rs. 150 per kg so that the mixed tea when sold for Rs. 194.40 per kg, gives a profit of 20%.

A. 2 : 5 B. 3 : 5 C. 5 : 3 D. 5 : 2

Ans : A

Alligation(Assignment)

Q. In what ratio must a mixture of 30% alcohol strength be mixed with that of 50% alcohol strength so as to get a mixture of 45% alcohol strength?

A. 1 : 2 B. 1 : 3 C. 2 : 1 D. 3 : 1

Ans : B

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

- Number = 700
- 1% of 700 = 7
- 10% of 700 = 70

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)

Percentage

Q. x is 80% of y. So y is ____% of x

Solution:

x = 80y

$x = \frac{4}{5} y$

So, $y = \frac{5}{4} x$

y = 125%

Percentage

Q. A number x is increased by 20% then the number is decreased by 20%. Find the net % change.

- Soln :
- If a number is increased / decreased by x% then there is always a loss of $-(x/10)^2$
- Net % Change = $-(20/10)^2$ = -(400/100) = - 4% (loss)
- **OR**
- Let the number be 100
- 100 ↑ by 20% =120
- So 20% ↓ of 120 = 96

- 100 120 96

-4% = net change

Percentage

Q. A number x is increased by 50% then the number is increased by 20% and again by 10%. Find the net % change

Soln:

- Let the number be 100
- 100↑ by 50% =150
- Again, 150↑ by 20% =30, So 150 + 30 = 180
- 10%↑of 180 = 18, So, 180 + 18 = 198

- 100 150 180 198

98% = net change

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%

Percentage

- **Percentage Change & effect on Product**

If A x B = Product

If A is changed by a% & also B is changed by b% then

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

Percentage

Q. Find % Change of area of rectangle if length increases by 30% & breadth decreases by 12%

Soln :

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

% Change of Area = +30 – 12 + (30 x -12)/100

= 18 – 3.6 = + 14.4%

Percentage

Q. If the radius of a circle is decreased by 50%, find the percentage decrease in its area.

- A. 55% B. 65% C. 75% D. 85%
- Soln:
- Area of a circle = πr^2 where r is the radius
  => Area is directly proportional to r^2
- Assume the old radius is = r1=100
- $A_1 = \pi \times 100^2 = 10000\pi$

  Assume the new radius is = r2=50

  $A_2 = \pi \times 50^2 = 2500\pi$

  Decrease in area = $10000\pi - 2500\pi = 7500\pi$

  Percentage decrease in area = $\frac{difference}{old}$ x100 = $\frac{7500\pi}{10000\pi}$ x 100 = 75%
- **Ans : C**

Percentage

- Expenditure = Price x Consumption
- $P \propto \frac{1}{\text{Consumption}}$
- So, for expenditure to remain constant, when one quantity increases the other quantity should decrease proportionally.
- Eg: If the price of a commodity is decreased by 20% and its consumption is increased by 20%, what will be the increase or decrease in expenditure on the commodity?
- Soln:

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

% Change = -20 + 20 + (-20 x 20)/100

= 0 -4 = -4%

OR

100 === 20%↓(Decrease in Price) ===> 80 === 20%↑(Increase in Consumption) ===> 96.

Thus, there is a decrement of 4%

Percentage(Assignment)

Q. 1.14 expressed as a per cent of 1.9 is:

A. 6% B. 10% C. 60% D. 90%

Ans: C

Percentage(Assignment)

Q. A number x is increased by 20% then the number is increased by 10% and again by 50%. Find the net % change.

A. 77% B. 75% C. 88% D. 98% E. 99%

Ans : D

Percentage(Assignment)

Q. If the altitude of a triangle increases by 5% and the base of the triangle increases by 7%, by what percent will the area of the triangle increase?

A. 12.25% B. 12.35% C. 6.00% D. 5.25%

Ans B

Percentage(Assignment)

Q. The length and breadth of a room are increased by 25% and 40% respectively. While the height is decreased by 20%.Find % change.

A. 16% B. 40% C. 60% D. 30%

Ans B

THANK YOU