

GENERAL APTITUDE

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TopicWise Test Plan

<u>TEST NAME</u>	<u>TOPICS</u>
APT I 1	Numbers + LCM + HCF + Ages + Averages
APT I 2	Percentages + Alligations & Mixtures + Profit & Loss
APT I 3	Time & Work + Pipes & Cisterns + Chain Rule
APT I 4	Time & Distance + Trains + Boats + Interest
APT I 5	Clock + Calendar + Probability + Permutation Combination



Averages

- **Simple Average** :

- An average of a set of values is the sum of values divided by the total number of values.
- Average of 'n' values = (Sum of the 'n' values)/n
- This is also called as Arithmetic Mean.
- Average (A) = Sum (S)/ Number(n)
- $S = A \times n$

- **Weighted Average** :

- When all values whose average we want to find do not have uniform occurrences we calculate the weighted average.
- If values $x_1, x_2, x_3 \dots$ occur $w_1, w_2, w_3 \dots$ times then
- Weighted Avg =
$$\frac{(w_1x_1 + w_2x_2 + w_3x_3 + \dots)}{(w_1 + w_2 + w_3 \dots)}$$



Averages

Q. In a class of 50 students, 24 secured 60 in Physics, 16 secured 70 marks and the rest secured 80. What is the average score for Physics in the class?

A. 64.8 B. 65.4 C. 67.2 D. 66.7

• Soln

Students	24	16	10.
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Marks	60	70	80
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Average	$= \frac{24 \times 60 + 16 \times 70 + 10 \times 80}{24 + 16 + 10}$ $= 3360/50$ $= 67.2$		
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Ans : C



Averages

Q. The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

A. 48

B. 45

C. 43

D. 44

Ans: D



Averages(Method 1)

Q. The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

- Before teacher , total age of students = 22×21
- After teacher is added,

Total age of all students + Age of the teacher = 23×22

- Age of the teacher = $23 \times 22 - 22 \times 21$
= $22(23 - 21)$
= 22×2
= 44 years



Averages(Method 2)

- The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

- **Solution 2**

- New value = old avg + $(n \pm 1)(\text{diff})$

+ if member added
- If member removed

- Where, n = total no. of students

- New value = $21 + (22+1)(1)$
= $21 + 23$
= 44 years



Averages(Method 1)

Q. There are 50 students in a class. Their average weight is 45 kg. When one student leaves the class the average weight reduces by 100 g. What is the weight of the student who left the class ?

- A. 45 kg. B. 47.9 kg. C. 49.9 kg. D. 50.1 kg.

Soln:

Total weight of 50 students = (45×50) kg = 2250 kg

Average weight of 49 students = $45\text{kg} - 100\text{g} = 44.9$ kg

So, total weight of 49 students = $(44.9 \times 49)\text{kg} = 2200.1\text{kg}$

Weight of the students who left the class = $2250 - 2200.1 = 49.9$ kg

Ans: C



Averages(Method 2)

Q. There are 50 students in a class. Their average weight is 45 kg. When one student leaves the class the average weight reduces by 100 g. What is the weight of the student who left the class ?

A. 45 kg.

B. 47.9 kg.

C. 49.9 kg.

D. 50.1 kg.

Soln:

$$\text{New value} = \text{old avg} + (n \mp 1)(\text{diff})$$

$$= 45 + (50 - 1)(0.1)$$

$$= 45 + 49(0.1)$$

$$= 45 + 4.9$$

$$= 49.9 \text{ kg}$$

$$(\text{ as we convert } 100\text{g into kg} = \frac{100}{1000} = 0.1 \text{ kg })$$

Ans: C



Averages

Q. The average age of 16 men increases by 3 years when a person 27 years old is replaced by another. How old is the new person?

A. 75 B. 30 C. 48 D. 64

Soln

- Average of 16 men increases by 3 years means,
- total age increases by $16 \times 3 = 48$
- So, total age of the person replacing another person = $27 + 48 = 75$ years

Ans : A



Averages

Q. The average age of 8 men is decreased by 2 years when two of them, whose ages are 22 and 28, are replaced by two new men.. What is the average age of two men?

Soln:

- Average of 8 men reduce by 2 years means total age reduces by 16 if two men leave.
- So, the total age of the new men replacing the old men = $22+28-16=34$
- \Rightarrow Average = $34/2 = 17$ years.

OR

- Total age decreased= $(8 * 2)$ years = 16 years.
- Sum of ages of two new men = $(22 + 28 - 16)$ years = 34 years
- Average age of two new men = $(34/2)$ years = 17 years.



Averages(Assignment)

Q. The average age of a class of 39 students is 15 years. If the age of the teacher be included, then the average increases by 3 months. Find the age of the teacher.

- A. 20 years B. 25 years C. 30 years D. 27 years

Ans : B



Averages(Assignment)

Q. The average marks of a class of 87 students is 56. When a new student was added and average becomes 56.5. Find marks of new student.

- A. 56 B. 44 C. 100 D. 90

Ans: C



Averages(Assignment)

Q. Find the average of first 97 natural numbers.

A. 47 B. 37 C. 48 D. 49 E. 49.5

Ans: D



Averages(Assignment)

Q. The average age of a class of 30 students is 9years. When teacher's age is also added, the average becomes 10. What is the age of the teacher?

- A. 41 years B. 40 years C. 39 years D. 42 years

Ans: B



Averages(Assignment)

Q. The average of 50 numbers is 30. If two numbers, 35 and 40 are discarded, then the average of the remaining numbers is nearly:

A. 28.32 B. 29.68 C. 28.78 D. 29.27

Ans: B



Averages(Assignment)

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

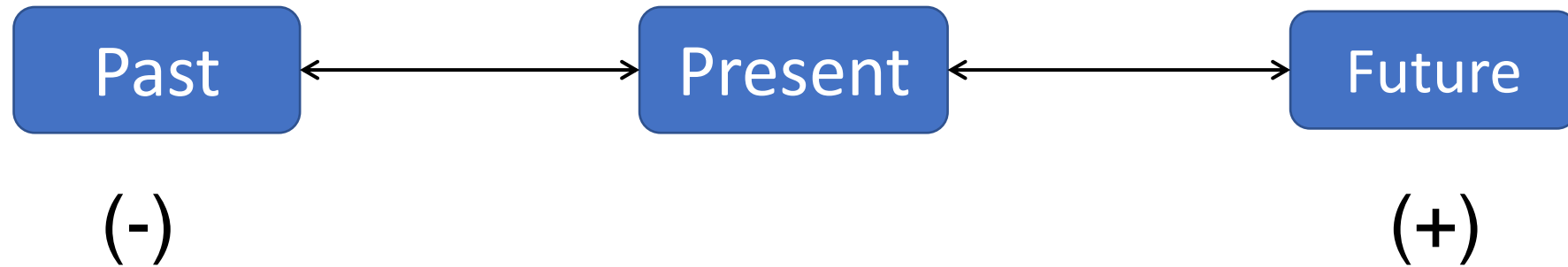
D. 41 years

Ans : D



Ages

Ram is at present some age(x) . Age 15 years ago or future age, then



'n' times of Ram's age means ,
= n x age



Ages

Q. Karan's age after 15 years will be 5 times his age 5 years back. What is the present age of Karan?

A. 12 years B. 10 years C. 20 years D. 25 years

Soln:

Present age = x

As given,

Future age = $x + 15$

Old age = $x - 5$  5 times is that n times

So , $x + 15 = 5(x - 5)$

$$x + 15 = 5x - 25$$

$x = 10$ years(Karan's present age)



Ages

Q. Present age of Sam & Ana are in the ratio 5:4 respectively. Three years hence ,their ratio will become 11:9 respectively. What is Ana's present age?

A. 6 years B. 24 years C. 28years D. 32years

Soln:

Present age –

S -> 5x

A -> 4x

3 years hence means (+) as its future ratio given and so its fraction

$$\frac{5x+3}{4x+3} = \frac{11}{9}$$

$$45x+27 = 44x + 33$$

$$x = 6 \text{ years}$$

For A,

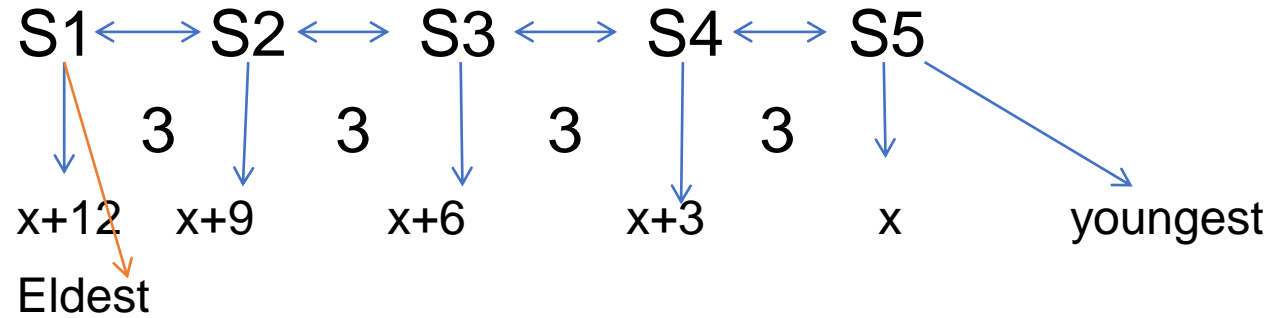
$$4x = 4 \times 6 = 24 \text{ years}$$



Ages

Q. Consider 5 siblings born apart by 3 years each. If the sum of the ages of all children is 50 years. What is the age of youngest child?

Soln :



Given,

Sum of ages = 50 years

$$x+12+x+9+x+6+x+3+x = 50$$

$$5x + 30 = 50$$

$$x = 4 \text{ years (age of youngest child)}$$



Ages

Q. A mother said to her daughter “ I was as old as you are at the time of your birth”. If the mother’s age is 38 years now. What was the daughter’s age 5 years back?

- A. 14years B. 19years C. 38years D. None of these

Soln:

	M	D
Present	38	x
At birth time	38-x	0

“ I was as old as you are at the time of your birth” shows

M D

$$38 - x = x$$

$$38 = 2x$$

$$x = 19 \text{ years (present age of daughter)}$$

5 years back, $19 - 5 = 14$ years

$$\begin{aligned} \text{Mother's age at time of birth} &= 38 - x \\ &= 38 - 19 \\ &= 19 \text{ years} \end{aligned}$$



Ages

Q. A is 2 years old than B who is twice as old as C. The total ages of A,B,C be 27. How old is B?

A. 5 years B. 12 years C. 10 years D. None of these

• **Soln:**

- So, we need to first find x here
- $A = 2 + B$
- $B = 2C$
- $C = x$
- So B becomes $B = 2x$
- So my A becomes,
- $A = 2 + B$
- $A = 2 + 2x$
- Given, the total age = $A + B + C = 27$
- Substitute the values here for A,B,C
- $2 + 2x + 2x + x = 27$
- $5x = 25$
- $x = 5$ years
- Age of B = $2x = 2 \times 5 = 10$ years



Ages(Assignment)

Q. The ratio of Present age of A and B is 6:7. A is 7 years younger than C. C's age after 8 years will be 51 years. Then what is the difference between the present ages of A and B?

A. 3 Years B. 4 Years C. 5 Years D. 6 Years E. Cannot be determined

Ans : D



Ages(Assignment)

Q. The average age of A, B, C, D and E is 40 years. The average age of A and B is 35 years and the average of C and D is 42 years. Age of E is :

A. 48 years B. 46 years C. 42 years D. 45 years

Ans: B



Ages(Assignment)

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

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

* 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. $a \times d = b \times c$

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

$$a : b = b : c \quad \text{or} \quad a/b = b/c$$

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

$$a : b = b : c = c : d \quad \text{or} \quad a/b = b/c = c/d$$



Ratio & Proportion

Q. If $A : B = 2 : 3$, $B : C = 4 : 5$ and $C : D = 5 : 9$ then $A : D$ is equal to:

A. $11 : 17$ B. $8 : 27$ C. $5 : 9$ D. $2 : 9$

Ans : B



Ratio & Proportion

Q. What is the value of $A+B / A-B$, if $A/B = 7$

A. $4/3$ B. $2/3$ C. $2/6$ D. $7/8$

$$A/B = 7/1$$

$$A+B/A-B = 7+1/7-1 = 8/6 = 4/3$$

Ans : A



Ratio & Proportion

If $A : B = 2 : 3$ and $B : C = 4 : 5$ then $A : B : C$ is

A. $2 : 3 : 5$

B. $5 : 4 : 6$

C. $8 : 12 : 15$

D. $6 : 4 : 5$

Ans : C

- $\frac{A}{B} = \frac{2}{3}$
- $\frac{B}{C} = \frac{4}{5}$

-

$$A : B : C = 2 \times 4 : 3 \times 4 : 3 \times 5 = 8 : 12 : 15$$



Ratio & Proportion

Q. A sum of Rs. 1240 is distributed among A, B and C such that the ratio of amount received by A and B is 6 : 5 and that of B and C is 10 : 9 respectively. Find the share of C ?

A.Rs. 480 B.Rs. 360 C.Rs. 400 D.Rs. 630

• **Solution:**

• Given, $A : B = 6 : 5$
 $B : C = 10 : 9$
 $A : B : C$

• $6 : 5$
 $10 : 9$

$60 : 50 : 45$

$12 : 10 : 9$

$A : B : C = 12 : 10 : 9$

$12x + 10x + 9x = 1240$

$x = 40$

C's share = $9 \times 40 = \text{Rs. } 360$



Ratio & Proportion

Q. A bag contains total 1200 coins of 25 ps, 50 ps and 1 Re coins. If the number of coins are in the ratio 6:5:4 find the total amount in the bag.

A. Rs 200 B. Rs 120 C. Rs 320 D. Rs 640

<u>25 ps</u>	<u>50 ps</u>	<u>1 Re</u>
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6	5	4
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$$6x + 5x + 4x = 1200$$

$$15x = 1200 \rightarrow x = 80$$

$$6x = 480 \text{ coins} \times \frac{1}{4} = \text{Rs } 120$$

$$5x = 400 \text{ coins} \times \frac{1}{2} = \text{Rs } 200$$

$$4x = 320 \text{ coins} \times 1 = \text{Rs } 320$$

$$\text{Total} = \text{Rs } 640$$

Ans : D



Ratio & Proportion

Q. Divide Rs 18200 amongst 3 persons such that A gets $\frac{5}{9}$ th of what B & C together get & B gets $\frac{6}{7}$ th of what A & C together get. What does C get?

- A. Rs 6500 B. Rs 3300 C. Rs 8400 D. Rs 1400

Soln:

A : (B+C)

5 : 9

$$A+B+C = 5x+9x = 14x$$

$$14x = 18200 \rightarrow x = 1300 \rightarrow A = 5x = 6500$$

B : (C+A)

6 : 7

$$A+B+C = 6y + 7y = 13y$$

$$13y = 18200 \rightarrow y = 1400 \rightarrow B = 6y = 8400$$

$$C = 18200 - 8400 - 6500 = 3300$$

Ans : B



Ratio & Proportion(Assignment)

Q. If $A:B = 2:3$, $B:C = 4:5$ and $C:D = 6:7$ Find $A:D$ is equal to:

A. $16 : 35$ B. $8 : 25$ C. $4 : 15$ D. $2 : 10$

Ans : A



Ratio & Proportion(Assignment)

Q. The difference between two positive numbers is 10 and the ratio between them is 5 : 3. Find the product of the two numbers.

A.375

B.175

C.275

D.125

E.250

Ans : A



Ratio & Proportion(Assignment)

Q. Two numbers are in ratio 4 : 5 and their LCM is 180. The smaller number is

A.9 B.15 C.36 D.45

Ans : C



Ratio & Proportion(Assignment)

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



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
60

Type 2
120

75

$$x = d - m$$

$$y = m - c$$

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

CP of cheaper
ingredient (c)

CP of costlier
ingredient (d)

Mean Price (m)

CP of costlier ingredient
- Mean Price

Mean Price - CP of
cheaper ingredient

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

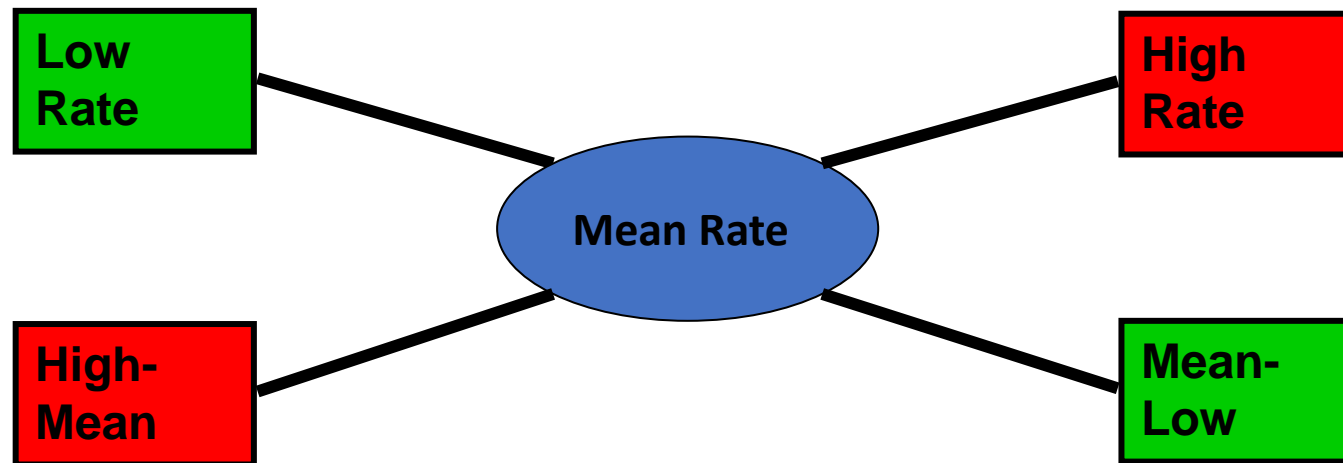


Alligation

$$\frac{\text{Quantity of Lower}}{\text{Quantity of Higher}} = \frac{(\text{C.P. of Higher}) - (\text{Mean Price})}{(\text{Mean Price}) - (\text{C.P. of Lower})}$$

$$\frac{Q_l}{Q_h} = \frac{CP_h - CP_m}{CP_m - CP_l}$$

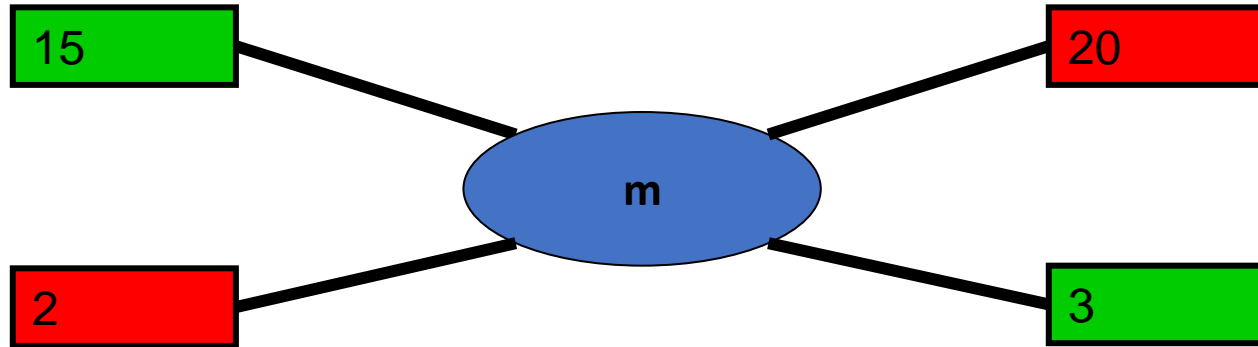
$$(\text{Qty Low}) : (\text{Qty High}) = (CP_h - CP_m) : (CP_m - CP_l)$$



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:



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

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

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



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:

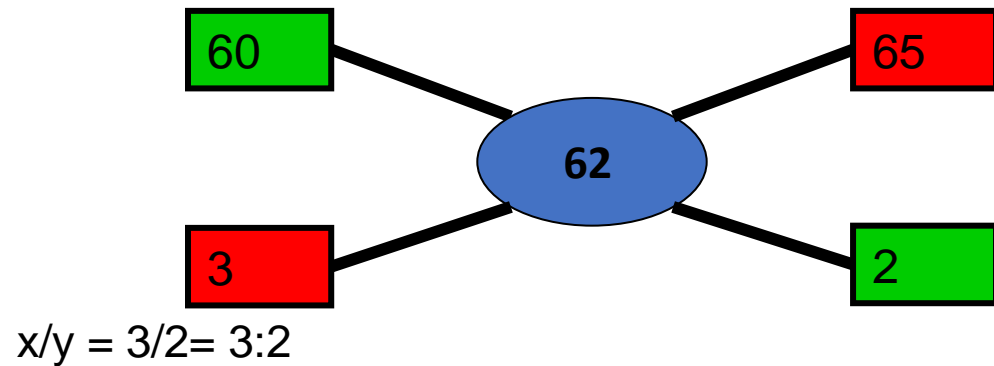
- Mean price is always CP
- Steps-
- 1. $m=?$
- 2. $m = \text{cost price(CP)}$
- 3. SP here is??
- 4. find $x/y=?$



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



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

$$\begin{aligned} \text{Profit\%} &= \frac{\text{SP}-\text{CP}}{\text{CP}} \times 100 \\ &= \frac{192 - \frac{1600}{9}}{\frac{1600}{9}} = \frac{1728 - 1600}{1600} = \frac{128}{16} = 8\% \end{aligned}$$

cheaper price

160

dearer price

200

m

5

4



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

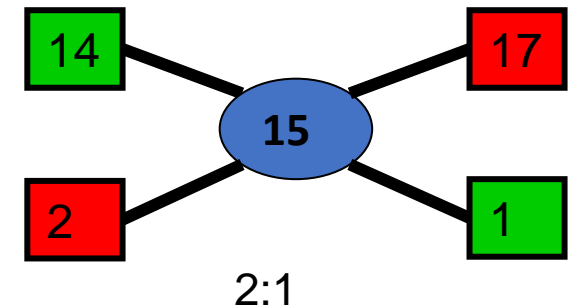
To make calculations easier, convert all denominator into common one
So, find $\text{LCM}(12, 24, 8) = 24$

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

B
 $\frac{17}{24}$

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

forget denominators,
By rule of Alligation,



Alligation(Assignment)

Q. Find the ratio in which the contents of 2 jars A & B containing spirit & water in the ratio 1:3 & 3:2 respectively must be mixed so that resulting mixture contains 45% spirit?

A. 2:3

B. 3:5

C. 3:2

D. 3:4

Ans D



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)

Fract ion x100	% ÷100	Fracti on	%	Fracti on	%	Fracti on	%	Fracti on	%
3/4	75%	5/4	125%	1/1	100%	1/6	16.66 %	1/11	9.09 %
4/5	80%	3/2	150%	1/2	50%	1/7	14.28 %	1/12	8.33 %
2/3	66.66 %	1/16	6.25%	1/3	33.33 %	1/8	12.5 %	1/13	7.69 %
5/6	83.33 %			1/4	25%	1/9	11.11 %	1/14	7.14 %
6/5	120%			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:

$$x = 83.33y$$

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

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

$$y = 120\% \text{ (from chart)}$$



Percentage

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

Solution:

$$x = 80y$$

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

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

$$y = 125\%$$



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

- $100 \uparrow$ by 20% = 120

- So 20% \downarrow 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
- $100 \uparrow$ by 50% = 150
- Again, $150 \uparrow$ by 20% = 30, So $150 + 30 = 180$
- 10% \uparrow 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

$$\text{Net \% Change in Number} = a + b + \frac{ab}{100} \quad (+ve \text{ or } -ve)$$



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 = $a + b + \frac{ab}{100}$ (+ve or -ve)

$$\begin{aligned}\% \text{ Change} &= 12 - 18 + (12 \times -18)/100 \\ &= -6 - 2.16 \\ &= -8.16\%\end{aligned}$$



Percentage

- Percentage Change & effect on Product

If $A \times B = \text{Product}$

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

Net % Change in Product = $a + b + \frac{ab}{100}$ (+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 = $a + b + \frac{ab}{100}$ (+ve or -ve)

$$\begin{aligned}\text{\% Change of Area} &= +30 - 12 + (30 \times -12)/100 \\ &= 18 - 3.6 = + 14.4\%\end{aligned}$$



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
 \Rightarrow Area is directly proportional to r^2

- Assume the old radius is $= r_1 = 100$

- $A_1 = \pi \times 100^2 = 10000\pi$

Assume the new radius is $= r_2 = 50$

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

$$\text{Decrease in area} = 10000\pi - 2500\pi = 7500\pi$$

$$\text{Percentage decrease in area} = \frac{\text{difference}}{\text{old}} \times 100 = \frac{7500\pi}{10000\pi} \times 100 = 75\%$$

- **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)

$$\begin{aligned}\% \text{ Change} &= -20 + 20 + (-20 \times 20)/100 \\ &= 0 - 4 = -4\%\end{aligned}$$

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



Percentage(Assignment)

Q. If the length of a rectangle is increased by 37.5% and its breadth is decreased by 20%, find the change in its area.

A. 15% increase B. 13% decrease C. 10% increase D. 10% decrease

Ans: C



Percentage(Assignment)

Q. If the price of sugar increases by 25%, by what percent will a housewife have to reduce her consumption to leave total expenditure on sugar unchanged?

- A. 25% B. 35% C. 20% D. 15%

Ans: C



THANK YOU

