GENERAL APTITUDE

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Ages(Poll)

Q. The sum of the ages of two brothers 21 years hence will be twice the sum of their ages today. If the difference in their ages is 12 years, how old is the younger brother?

A. 27 years B. 21 years C. 17 years D. 15 years

Ans : D

Soln-

Present age of elder brother = x

Present age of younger brother = y

After 21 years , elder brother = x+21 and younger brother = y+21

As per given condition,

x+21 + y+21 = 2(x + y) ------ (1)

x – y =12 ------(2)

Solving 1 and 2 , we get ,

x = 27 years and y = 15 years

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

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

Soln:

$$\frac{A}{D} = \frac{A}{B} \times \frac{B}{C} \times \frac{C}{D}$$

$$\frac{A}{D} = \frac{2}{3} \times \frac{4}{5} \times \frac{5}{9}$$

$$\frac{A}{D} = \frac{8}{27}$$

Ans : B

Ratio & Proportion(Assignment)

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

Ans : A

A/B = 7/1

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

Ratio & Proportion

If X : Y = 3 : 4 and Y : Z = 8 : 9 then X : Z is

A. 3 : 4 B .5 : 4 C. 2 : 3 D. 8 : 9

Soln:

X : Y = 3 : 4

(Inverted N)

Y : Z = 8 : 9

= 3x8 : 8x4 : 4x9

= 24 : 32 : 36

= 6 : 8 : 9

Now, X : Z

6 : 9

2 : 3

Ans: C

$$\frac{X}{Z} = \frac{X}{Y} \times \frac{Y}{Z}$$

$$\frac{X}{Z} = \frac{3}{4} \times \frac{8}{9}$$

$$\frac{X}{Z} = \frac{2}{3}$$

Ratio & Proportion(Assignment)

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 : 3

4 : 5

- A : B : C = 2 × 4 : 3 × 4 : 3 × 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

- **Soln:**
- 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 × 40 = Rs. 360

Ans : B

Ratio & Proportion

If A : B = 2 : 3, B : C = 4 : 5 and C : D = 6 : 7. Find A:B:C:D

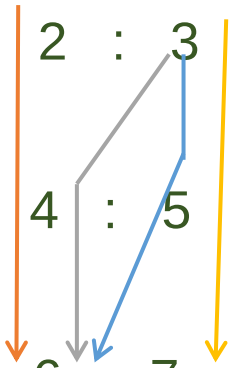
A. 2 : 3 : 4 : 5 B. 2 : 12 : 30 : 7 C. 16 : 24 : 30 : 35 D. 4 : 5 : 6 : 7

Soln:

A : B = 2 : 3

B : C = 4 : 5

C : D = 6 : 7



A	:	B	:	C	:	D
= ABC	:	BBC	:	BCC	:	BCD
= 2X4X6	:	3X4X6	:	3X5X6	:	3X5X7
= 48	:	72	:	90	:	105
= 16	:	24	:	30	:	35

Ans: C

Ratio & Proportion

Dividing a given number in the given Ratio :

Let A be the given number. Let the given ratio be a:b:c

This means A is divided into three parts such that

First Part = A x a/(a+b+c)

Second Part = A x b/(a+b+c)

Third Part = A x c/(a+b+c)

And First Part + Second Part + Third Part = A

Any Part = Total Amount x (Its related ratio term / Sum of Ratio Terms)

Ratio & Proportion

Q. Find B's share in Rs 6,300 if A:B = 2:3, B:C = 4:5, C:D = 3:7

A.Rs 1080 B. Rs 1800 C. Rs 810 D. Rs 1200

Soln:

A/B	B/C	C/D
2/3	4/5	3/7

A : B = 2 : 3

B : C = 4 : 5

C : D = 3 : 7

A : B : C : D

8 : 12 : 15 : 35

So B's share = 6300 x 12/70 = 1080

Ans : A

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

Soln:

25 ps	50 ps	1 Re
6	5	4

$6x + 5x + 4x = 1200$

$15x = 1200 \rightarrow x = 80$

6x = 480 coins x ¼ =Rs 120

5x = 400 coins x ½ =Rs 200

4x = 320 coins x 1 =Rs 320

Total =Rs 640

Ans : D

Ratio & Proportion

Q. Divide Rs. 18200 amongst 3 persons such that A gets 5/9th of what B & C together get & B gets 6/7th 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 → x =1300 → A = 5x = 6500

B : (C+A)

6 : 7

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

13y =18200 → y = 1400 → 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. A bag contains total of Rs 2400 in the form of 25 ps, 50 ps and 1 Re coins. If the total amounts of each type of coins are in the ratio 3:4:5 find the total no of coins in the bag.

A. 2000coins B. 4000 coins C. 5500 coins D. 5000 coins

Ans : D

Ratio & Proportion(Assignment)

Q. The average income of all employees is Rs. 20000. The average salary of male employees is Rs. 22000. The average salary of female employees is Rs. 15000. What is the ratio of male employees to female employees?

A. 2 : 5 B. 3 : 4 C. 5 : 2 D. 3 : 5

Ans: C

Ratio & Proportion(Assignment)

Q. The sum of 3 numbers is 98. If ratio between first and second numbers be 2 : 3 and between second and third be 5 : 8, then the second number is?

A. 30 B. 40 C. 50 D. 60

Ans: A

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.

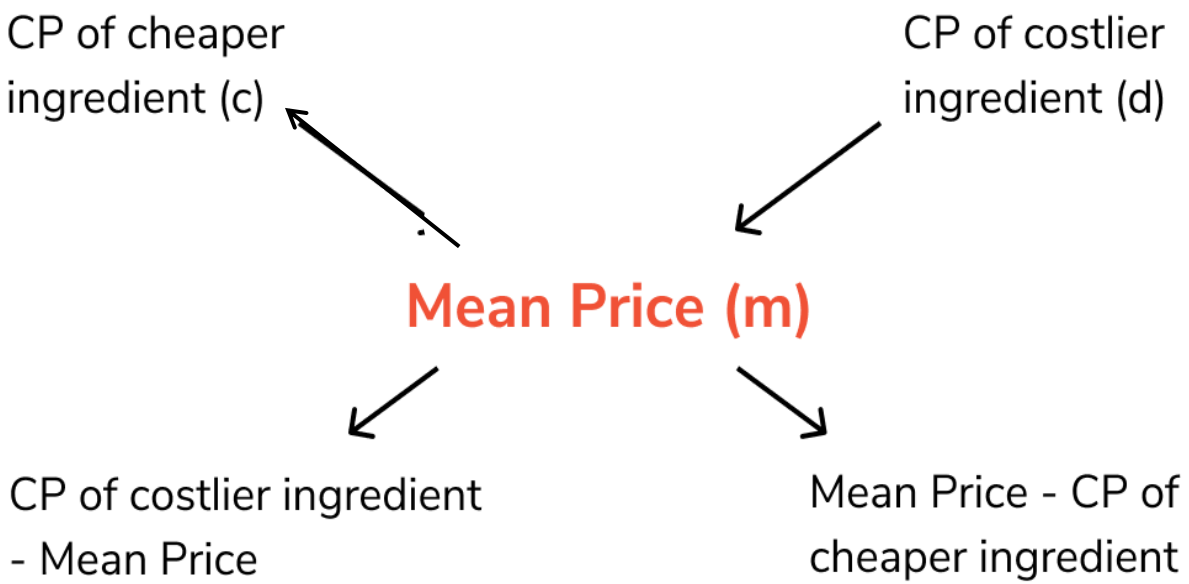
Soln:

Type 1 60 Type 2 120

75

x = d-m y =m-c

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



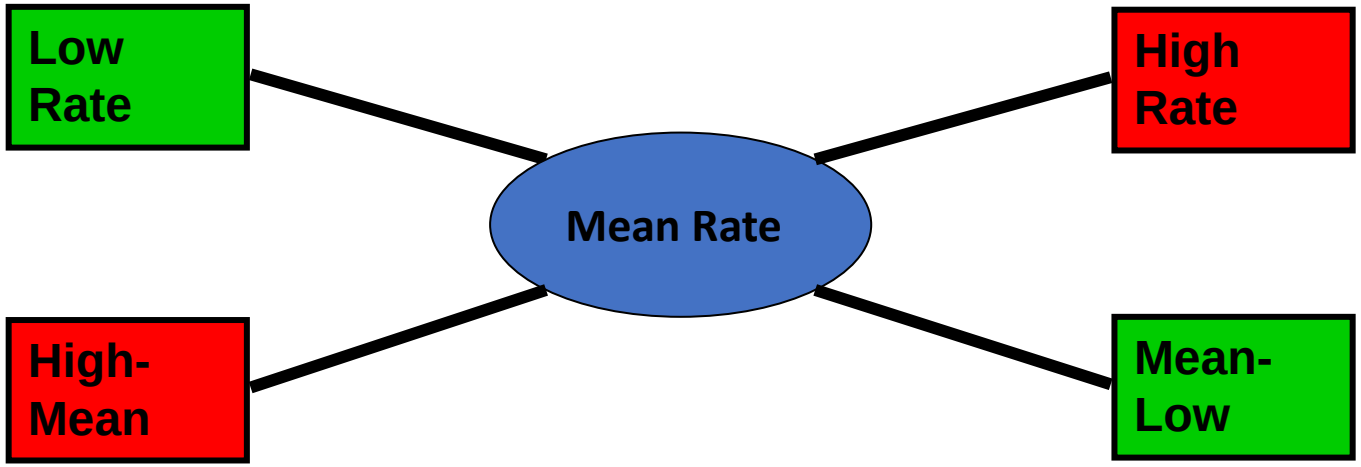
$$\frac{\text{Quantity of cheaper ingredient}}{\text{Quantity of costlier ingredient}} = \frac{d - m}{m - c}$$

Mixtures & Alligation

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

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

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

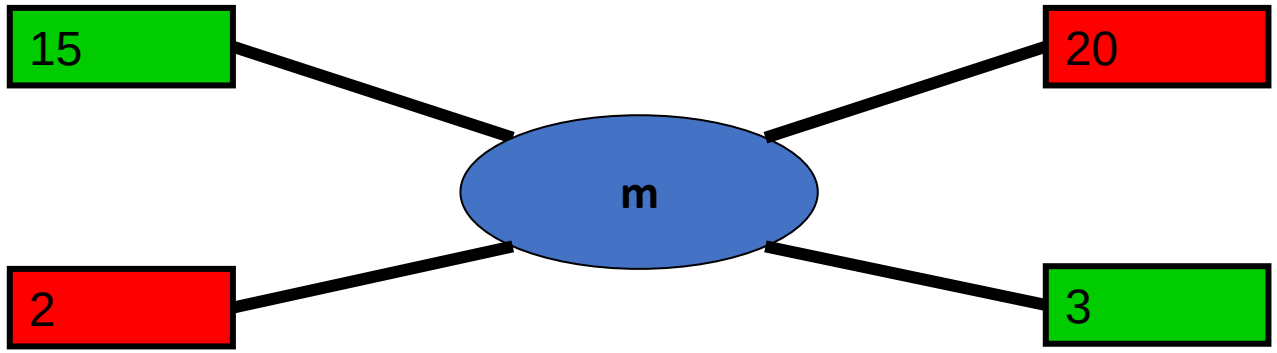


Mixtures & Alligation

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.

A. Rs. 28 B. Rs. 17 C. Rs. 18 D. Rs. 48

Soln:



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

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

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

Ans: C

Mixtures & 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:

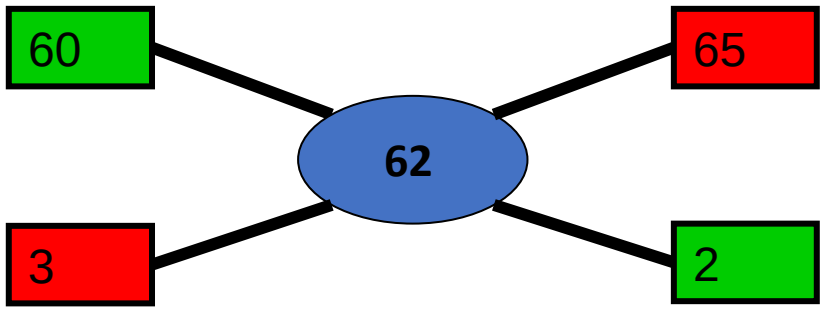
- Mean price is always CP
- Steps-
- 1. m=?
- 2. m = cost price(CP)
- 3. SP = given
- 4. find x/y=?

Mixtures & 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%.

A. 3:2 B. 2:3 C. 3:4 D. 4:3

- SP of 1 kg of mixture = Rs. 68.20
- Gain =10%
- In case of profit, SP = $\frac{\text{C.P. x (100 +\%gain)}}{100}$
- CP of 1kg of mixture = Rs ($\frac{100}{100+10}$ x 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



Ans: A x/y = 3/2= 3:2

Mixtures & Alligation

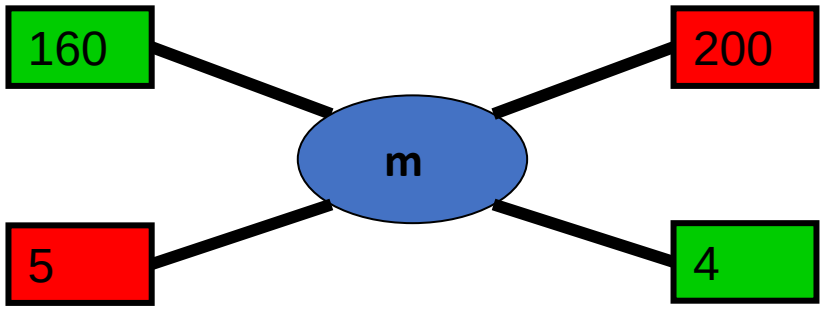
Q. A person blends two varieties of tea, one cost Rs. 160/kg and other cost Rs. 200/kg in the ratio 5 : 4. He sells the blended variety at Rs.192/kg. Find the profit %.

A. 6% B. 8% C. 7% D. 9%

Soln :

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

cheaper price dearer price



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

5m -800 = 800 -4m

9m = 1600

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

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

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

$= \frac{192 - \frac{1600}{9}}{\frac{1600}{9}} = \frac{1728 - 1600}{1600} = \frac{128}{16} = 8\%$ **Ans: B**

Mixtures & 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?

A. 2:1 B. 1:2 C. 2:3 D. 3:4

Soln:

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

A

m:w

7:5

B

m:w

17:7

C

m:w

5:3

We consider milk here, so fraction of milk,

A

$\frac{7}{7+5} = \frac{7}{12}$

B

$\frac{17}{17+7} = \frac{17}{24}$

C

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

Ans: A

To make calculations easier, convert all denominator into common one

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

A

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

B

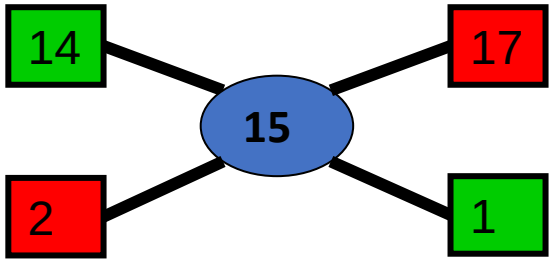
$\frac{17}{24}$

C

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

forget denominators,

By rule of Alligation,



2:1

Mixtures & Alligation

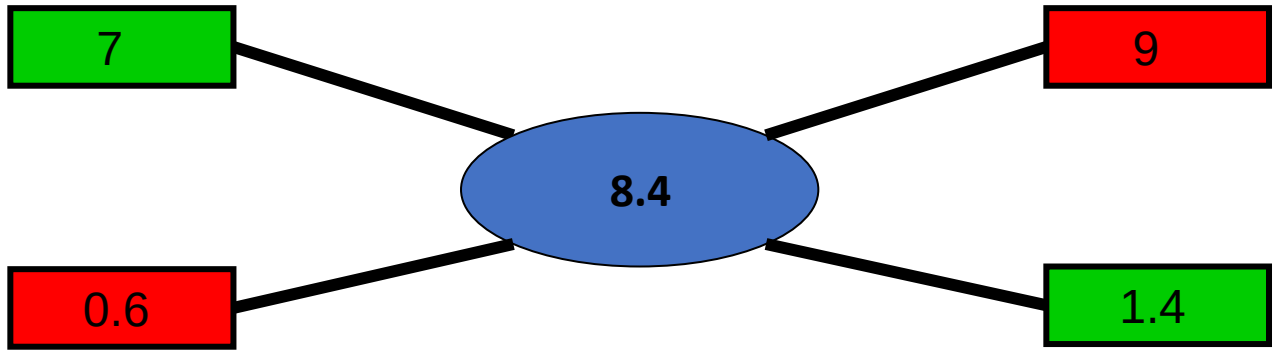
Q. How many kg of sugar costing Rs. 9 per kg must be mixed with 27kg of sugar costing Rs. 7 per kg, so that there maybe a gain of 10% by selling the mix at 9.24 per kg ?

A. 62kg B. 63kg C. 53kg D. 59kg

Soln:

$$SP = \frac{C.P. \times (100 + \%gain)}{100}$$

CP (Mean) = 9.24 x 100/110 = 8.4



- Qty of Low : Qty of High = 0.6/1.4 = 6/14 = 3/7
- 27 / Q_H = 3/7
- Q_H = 27 x 7/3 = 63 kg

Ans: B

Mixtures & Alligation(Assignment)

Q. What quantity of sugar costing Rs 21.20 per kg must be mixed with 144 kg of sugar priced at Rs 26.20 per kg so that 10% may be gained by selling mix at Rs 25.30/kg ?

A. 256 kg B. 265 kg C. 244 kg D. 144 kg

Ans: A

Mixtures & Alligation(Assignment)

Q. Find the ratio in which the contains 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

Mixtures & 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

Mixtures & 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

Mixtures & 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

Mixtures & 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

Mixtures & Alligation(Assignment)

Q. A mixture of 70 litres of alcohol and water contains 10% of water. How much water must be added to the above mixture to make the water 12.5% of the resulting mixture?

A. 1 litre B. 1.5 litres C. 2 litres D. 2.5 litres

Ans: C

- Water=10% of 70 lit=7 lit,
- alcohol=90% of 70 lit=63 lit.
- Let, x lit water must be added.
  $\frac{(7+x)}{63} = \frac{12.5\%}{87.5\%}$
- 7 +x = 787.5/87.5
  7 + x = 9
- x=2 litres

Mixtures & Alligation(Assignment)

Q. In what ratio should two qualities of coffee powder having the rates of ₹47 per kg and ₹32 per kg be mixed in order to get a mixture that would have a rate of ₹37 per kg?

A. 1 : 2 B. 4 : 1 C. 1 : 3 D. 3 : 1 E. 1 : 4

Ans: A

Mixtures & Alligation(Assignment)

Q. How many kilograms of tea worth Rs. 3. 60 per kg. must be mixed with 8 kg. of tea worth Rs. 4.20 per kg. so that by selling the mixture at Rs. 4.40 per kg. There may be a of 10%.

A) 4 kg B) 3 kg. C) 6 kg. D) 8 kg.

Ans: A


THANK
YOU!