

TEST #03

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QUESTION NO-2

PART A

1- Given:

Ratio of two number = 3:5

New ratio after subtracting 9 = 12:23

2- To find:

Smallest number = ?

3- Solution:

Let the numbers be 'x' and 'y'; so ratio will be

$$x:y = 3:5$$

$$\text{or } \frac{x}{y} = \frac{3}{5} \implies x = \frac{3y}{5} \quad \text{--- ①}$$

Now, when 9 is subtracted from both numbers the ratio becomes,

$$\frac{x-9}{y-9} = \frac{12}{23}$$

putting eqn ① in this

$$\frac{(3y/5) - 9}{y-9} = \frac{12}{23}$$

$$\frac{3y-45}{5} = \frac{12}{23}$$

$$\frac{3y-45}{5} = \frac{12}{23}$$

$$\frac{3y-45}{5} = \frac{12}{23}$$

$$\frac{3y-45}{5} \times \frac{1}{y-9} = \frac{12}{23}$$

$$\frac{3y-45}{5} = \frac{12}{23}$$

$$\frac{3y-45}{5} = \frac{12}{23}$$

Cross multiplying both sides

$$23(3y-45) = 12(5y-45)$$

$$69y - 1035 = 60y - 540$$

$$\text{or } 69y - 60y = 1035 - 540$$

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$$9y = 495$$

Dividing both sides by '9' we get.

$$\frac{9y}{9} = \frac{495}{9}$$

$$y = 55$$

Now, putting value of 'y' in eqn ①

$$x = 3y$$

$$x = 3(55)$$

$$y = 55$$

$$x = 3 \times 11$$

$$x = 33$$

So, by comparing both numbers, we get x as smallest number i.e.

The smallest no. = $x = 33$ Ans

X ————— X

PART B

1- Given:

Profit ratio of business partners = 5 : 7 : 8

Ratio of time period = 14 : 8 : 7.

2- To find:

Investments ratio, x?

3- Concept:

Profit = Investment \times time period.

4- Solution:

Partners A : B : C

Profit 5 : 7 : 8

Time period 14 : 8 : 7

Investment x = y = z (assumed)

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Now,

$$\frac{14x}{8y} = \frac{5}{7} \quad (\text{Ratio of profit of A \& B})$$

Cross multiplying both sides.

$$98x = 40y$$

$$x = \frac{40y}{98} = \frac{20y}{49}$$

$$x = \frac{20y}{49} \quad \text{--- eqn (1)}$$

Then,

$$\frac{14x}{7z} = \frac{5}{8} \quad (\text{Ratio of profit of A \& C})$$

By cross multiplication, we get.

$$\frac{112x}{108} = 35z$$

$$x = \frac{35z}{112}$$

or

$$z = \frac{16x}{35}$$

$$z = \frac{16x}{35} \quad \text{--- eqn (2)}$$

From equation (1) it can be inferred that

$$y = \frac{49}{20} x$$

Now

Ratios of investment

$$x : y : z$$

$$x : \frac{49x}{20} : \frac{16x}{35}$$

Multiplying by 20 through out equation we

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get.

$$20x : 49x : 34x$$

So

$$\text{ratio of investments is } 20 : 49 : 34 \quad \text{Ans}$$

PART C

1- Given:

Avg. weight of A, B, and C = 45 kg

Sum of weight of A & B = $A+B = 40$ kg

Sum of weight of B & C = $B+C = 43$ kg

2- To Find:

Weight of B = $B = ?$

3- Concept:

$$\text{Average} = \frac{\text{Sum of entities}}{\text{Total no. of entities}}$$

4- Solution:

As given

$$\text{Avg weight}_{(ABC)} = \frac{A+B+C}{3}$$

$$45 = \frac{A+B+C}{3}$$

$$A+B+C = 135$$

Also, average weight of A and B is

$$\text{Avg}_{(AB)} = \frac{A+B}{2}$$

$$40 = \frac{A+B}{2}$$

$$(\because \text{Avg}_{(AB)} = 40)$$

$$A+B = 80$$

Now, putting values in formula of $\text{Avg}_{(ABC)}$ that is

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$$\text{Avg. weight (ABO)} = \frac{A + B + C}{3}$$

$$45 = \frac{80 + C}{3}$$

$$135 = 80 + C$$

$$\text{or } C = 135 - 80$$

$$C = 55 \text{ kg}$$

As, it is also given that avg weight of B and C is 43, i.e.

$$\text{Avg weight (BC)} = \frac{B + C}{2}$$

$$43 = \frac{B + C}{2}$$

putting value of C in equation

$$43 = \frac{B + 55}{2}$$

$$86 = B + 55$$

or

$$B = 86 - 55$$

$$B = 31 \text{ kg}$$

So, weight of B is 31 kg | Ans

PART - D

1- Given:

A positive integer = let be x ?

Reciprocal of integer = $\frac{1}{x}$.

Equation given

$$x + 17 = 60 \left(\frac{1}{x} \right)$$

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2- To Find.

Value of positive integer = $x = ?$

3- Solution:

As the equation given is

$$x+17 = 60 \left(\frac{1}{x}\right)$$

$$x+17 = \frac{60}{x}$$

$$x(x+17) = 60$$

$$x^2 + 17x = 60$$

$$x^2 + 17x - 60 = 0$$

Opening equation using factorization method

$$x^2 + 20x - 3x - 60 = 0$$

$$x(x+20) - 3(x+20) = 0$$

$$(x-3)(x+20) = 0$$

so

Either

or

$$x-3 = 0$$

$$x+20 = 0$$

$$x = +3$$

$$x = -20$$

As the x is a positive integer so
the positive integer is $x = +3$. **Ans**

~~x~~

QUESTION # 03

PART A

1- Given:

Profit % earned = Rs 1920/- (selling price)

Loss % incurred = Rs 1280/- (selling price)

2- To find:

Selling price of item if sold at 25% profit.

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13- Concept:

$$\text{Profit \%} = \frac{S.P - C.P}{C.P} \times 100$$

$$\text{Loss \%} = \frac{C.P - S.P}{C.P} \times 100$$

4- Solution:

Let the cost price (C.P.) of the item be ₹x. So the profit % will be

$$\text{Profit \%} = \frac{S.P - C.P}{C.P} \times 100$$

$$1920 - P = \frac{1920 - x}{x} \times 100$$

and the loss % ~~when~~ which is equal to P at selling at ^{Rs} 1280

$$\text{Loss \%} = P = \frac{x - 1280}{x} \times 100$$

Now, $P = \text{loss \%}$

$$\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$

$$1920 - x = x - 1280$$

$$1920 + 1280 = x + x$$

$$\Rightarrow \frac{2x}{2} = \frac{3200}{2}$$

$$x = 1600$$

So the selling price of the item is ₹ 1600/-

Now, after 25% of profit selling price will be.

$$S.P = 1600 + \frac{25 \times 1600}{100}$$

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$$\begin{aligned} \text{S.P} &= 1600 + 25 \times 16 \\ &= 1600 + 400 \end{aligned}$$

Selling Price after 25% of profit	= Rs 2000	Ans
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X ——— X

PART - B

1- Given:

Days taken by A to complete work = 15 days
Days taken by B to complete work = 20 days
Worked together = 4 days.

2- To find:

Fraction of the work left = ?

3- Solution:

A takes 15 days to complete work so
work done by A in 1 day

$$A = \frac{1}{15}$$

Similarly, same is case with B i.e

$$B = \frac{1}{20} \quad (\text{work done in day})$$

Combined work done by A and B together.

$$\text{Combined work} = A + B$$

$$= \frac{1}{15} + \frac{1}{20}$$

$$= \frac{20+15}{60} = \frac{35}{60}$$

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

Combined work done in 4 days will be

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$$\text{Combined Work} = \frac{7}{15} \times 4$$

$$\boxed{\text{Combined - Work} = \frac{7}{15}}$$

So, ^{fraction of} work done in 4 days is $\frac{7}{15}$

Now;

$$\text{Fraction of Work left} = 1 - \frac{7}{15}$$

$$= \frac{15 - 7}{15}$$

$$= \frac{8}{15}$$

Hence $\rightarrow \frac{8}{15}$ fraction of work is left to be done.

X ————— X

Ans

PART - BC

1- Given:

Present age of a person = A = $\frac{2}{5}$ th of M (Mother)

Person's age after 8 years = A' = $\frac{1}{2}$ of M (mother)

2- To Find:

Mother age at Present = M = ?

3- Solution:

According to present age of A;

$$\boxed{A = \frac{2}{5} \times M} \quad \text{--- eqn (1)}$$

After 8 years

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$$A' = \frac{1}{2} \times M'$$

Where $A' = A + 8$ and $M' = M + 8$

so

$$A + 8 = \frac{1}{2} (M + 8)$$

From equation (1), putting value of A we get

$$\frac{2}{5} M + 8 = \frac{M + 8}{2}$$

$$\frac{2M + 8 \times 5}{5 \cdot 1 \times 5} = \frac{M + 8}{2}$$

$$\frac{2M + 40}{5} = \frac{M + 8}{2}$$

By cross multiplication we get;

$$2(2M + 40) = 5(M + 8)$$

$$4M + 80 = 5M + 40$$

$$\Rightarrow 5M - 4M = 80 - 40$$

$$\boxed{M = 40}$$

so

Current age of mother = M = 40 year
Ans

X — X

PART - D

1- Solution:

Let the number be 'x', then the wrong no. will be $\frac{5x}{3}$ and correct

be $\frac{3x}{5}$, so using formula of profit %

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$$\text{Error \%} = \frac{(5x/3 - 3x/5)}{5x/3} \times 100$$

$$= \frac{(25x - 9x/15)}{5x/3} \times 100$$

$$= \frac{(16x/15)}{5x/3} \times 100$$

$$= \frac{16x \times 3}{15 \times 5x} \times 100$$

$$= \frac{16}{25} \times 100$$

$$= 16 \times 4$$

$$\text{Error \%} = 64\%$$

Hence, the percentage error in the calculation is 64%

Ans

X = X