Mian Farzeen Umar (BG1)

GSA - Mock(5) - Ability Portion

→ Question 6

a) Mean = $\frac{\text{Sum of all values}}{\text{Number of all values}}$

$\Rightarrow \frac{9+8+10+x+12}{5} = 15$

(1) ⇒ Sum of known values:

$9+8+10+x+12 = 39$

(2) ⇒ Equation: $\frac{39+x}{5} = 15$

(3) ⇒ Solving the equation:

$39+x = 15 \times 5$

$39+x = 75$

$x = 75-39$

$\boxed{x = 36}$ → Value of x

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6(b) · Mixture contains sugar solution and colored water in ratio of 4:3.

→ Let's denote

i) Initial quantity of sugar solution as 4x liters

ii) Initial quantity of coloured water as 3x liters

· Total initial quantity of mixture is $4x + 3x = 7x$ liters

→ After 10 liters of coloured water is added

i) Quantity of sugar solution remains 4x liters

ii) Quantity of coloured water changes to $3x + 10$ liters

→ As per the information provided, the ratio of sugar solution to coloured water now becomes ⇒ 4:5

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→ Equation as per new ratio :

$$\frac{4x}{3x+10} = \frac{4}{5}$$

→ Solving the Equation

$$4x \times 5 = 4 \times (3x+10)$$

$$20x = 12x + 40$$

$$8x = 40$$

$$x = 5$$

→ Calculating Initial Quantity of Sugar Solution

• Initial Quantity of sugar Solution is "4x", x=5

$= 4(5) = 20$

Thus, initial quantity of Sugar solution in The mixture is 20 litres

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6(c) Football's shape is that of a sphere. Thus, to find the volume of the football, we use the formula of a sphere:

$$V = \frac{4}{3}\pi r^3$$

V: Volume
R: Radius
π: 3.142 (approx)

$\Rightarrow$ provided: 12cm

$\rightarrow$ Calculating the volume with the provided information, using the formula:

$$V = \frac{4}{3} \times \pi \times (12)^3$$

$$V = \frac{4}{3_1} \times 3.142 \times \cancel{1728}^{576}$$

$$V = \frac{4}{1} \times 3.142 \times 576$$

$$V = 12.568 \times 576$$

$$V = 7,239.16$$

The volume of the football is approximately **7,239.16 cubic cm**

Date:

6(a) Provided Series: -10, -8, 6, 40, 102, ?

→ Identifying The Pattern

i) Differences in Consecutive Terms

- $-8-(-10) = 2$
- $6-(-8) = 14$
- $40-6 = 34$
- $102-40 = 62$

ii) Examining differences between The differences

2, 14, 34, 62

12 20 28

8 8 ⇒ Differences form a sequence That increases by 8

- Next difference in The sequence should be: $28+8=36$

iii) Adding difference to The last difference

$62+36=98$

Date:

→ Adding this result to the last term of the original sequence to find the missing term

$$102 + 98 = 200$$

The next number in the sequence is $\boxed{200}$

→ Question 7

(a) → Provided Equation: 20% of $x = y$

→ Expanding the Equation:

$$\frac{20}{100} \times x = y$$

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

→ Finding value of y% of 20 in terms of x

i) $y\%$ of $20 = \frac{y}{100} \times 20$

ii) Substituting y from earlier equation:

$$y\% \text{ of } 20 = \frac{x/5}{100} \times 20$$

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→ Simplifying The expression:

$$= \frac{x}{5 \times 100} \times 20$$

$$= \frac{x}{500} \times 20$$

$$= \frac{20x}{500} = \frac{x}{25}$$

Y% of 20 in terms of x is

$$\boxed{\frac{x}{25}}$$

7(b) → Deriving Monthly Salaries:

i) P and Q

· Average monthly salary = Rs. 5050

$$\Rightarrow \frac{p+q}{2} = 5050$$

$$\boxed{\Rightarrow p+q = 10,100} \rightarrow (1)$$

ii) Q and R

· Average monthly salary = Rs. 6250

$$\Rightarrow \frac{q+r}{2} = 6250$$

$$\boxed{\Rightarrow q+r = 12,500} \rightarrow (2)$$

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iii) P and R

- Average monthly salary is = Rs. 5200

$\Rightarrow \frac{P+R}{2} = 5200$

$\boxed{\Rightarrow P+R = 10,400} \rightarrow (3)$

$\Rightarrow$ Solving Equations (1, 2, 3)

- $(P+Q) + (Q+R) + (P+R) = 10,100 +$
  $12,500 + 10,400$
  $\Rightarrow 2P + 2Q + 2R = 33,000$
  $\Rightarrow P+Q+R = \frac{33,000}{2} = 16,500$

i) Subtracting equation $(P+Q+R)$ from
   $(P+Q+R)$
- $(P+Q+R) - (P+Q)$
  $\Rightarrow 16,500 - 10,100$
- $R = 6400$

ii) Substituting r into equation (3): P+R
  $\Rightarrow P + 6,400 = 10,400$
  $\Rightarrow P = 10,400 - 6400 = 4,000$

Monthly Salary of P is $\boxed{\text{Rs. } 4,000}$

Date:

Q7(a) → Examining Probabilities of ~~Toss~~ 2 Coin Toss

i) Head - Head (HH) = $\frac{1}{4}$

ii) Head - Tail (HT) = $\frac{1}{4}$

iii) Tail - Head (TH) = $\frac{1}{4}$

iv) Tail - Tail (TT) = $\frac{1}{4}$

→ Provided Information

- Total numbers of trials (coin tosses) = 500
- Number of times two heads occurred = 105
- Number of times one head occurred = 275
- Numbes of times no head occurred = 120

→ Calculating Probabilities

i) Probability of getting 2 heads:

$P(\text{Two Heads}) = \frac{105}{500} = \boxed{0.21}$

ii) Probability of getting 1 head:

$P(\text{One Head}) = \frac{275}{500} = \boxed{0.55}$

iii) Probability of getting no heads:

$P(\text{No heads}) = \frac{120}{500} = \boxed{0.24}$

Date:

7(a) → Let Jamie's current age be : x, and Jamie's dad current age be : 4x (dad is 4 times older than Jamie)

(In 14 years)

- Jamie's age will be : x + 14
- Jamie's dad's age will be : 4x + 14

→ As per provided information, in 14 years, Jamie's dad will be twice the age of Jamie :

$$4x + 14 = 2(x + 14)$$

→ Solving the Equation

i) $4x + 14 = 2x + 28$

$4x - 2x = 28 - 14$

$2x = 14$

$x = 7$

- Jamie's current age is $\boxed{7}$

→ Jamie's dad's current age :

$4x$, $x = 7$

$\Rightarrow 4(7) = 28$

Sum of Jamie's age and his dad's age is:

$7 + 28 = \boxed{35}$