DAY - 31

Solution

Let the number of students receiving Gold, Silver, and Bronze awards before the adjustments be G, S, and B respectively.

Given:
$$\text{Total students} = 117$$
$$G + S + B = 117$$
$$G = \frac{1}{3} \times 117$$
$$S = 2B$$

Step 1: Calculate the number of Gold awards.
$$G = \frac{1}{3} \times 117 = 39$$

Step 2: Substitute $G = 39$ into the total equation.
$$39 + S + B = 117$$
$$S + B = 117 - 39$$
$$S + B = 78$$

Step 3: Substitute $S = 2B$ into the above equation.
$$2B + B = 78$$
$$3B = 78$$
$$B = \frac{78}{3} = 26$$

Step 4: Calculate S.
$$S = 2B = 2 \times 26 = 52$$

Therefore, before adjustments:

$$G = 39, \quad S = 52, \quad B = 26$$

Step 5: Apply the adjustments.

- 5 Silver awardees are upgraded to Gold:

$$G_{\text{new}} = G + 5 = 39 + 5 = 44$$

$$S_{\text{new}} = S - 5 = 52 - 5 = 47$$

- 3 Bronze awardees are upgraded to Silver:

$$S_{\text{new}} = S_{\text{new}} + 3 = 47 + 3 = 50$$

$$B_{\text{new}} = B - 3 = 26 - 3 = 23$$

Step 6: Verify given condition.

$$G_{\text{new}} + S_{\text{new}} = 44 + 50 = 94 \quad \text{(Matches the given condition)}$$

$$G_{\text{new}} + S_{\text{new}} + B_{\text{new}} = 44 + 50 + 23 = 117 \quad \text{(Total remains same)}$$

Final Answers:

Before adjustments: $G = 39$, $S = 52$, $B = 26$.

After adjustments: $G = 44$, $S = 50$, $B = 23$.