



Statistics Ex 7.5 Q6

Answer :

The given data is an inclusive series. So, firstly convert it into an exclusive series as given below.

| Height (in cm) | 159.5–162.5 | 162.5–165.5 | 165.5–168.5 | 168.5–171.5 | 171.5–174.5 |
|--------------------|-------------|-------------|-------------|-------------|-------------|
| Number of students | 15 | 118 | 142 | 127 | 18 |

Here, the maximum frequency is 142 so the modal class is 165.5–168.5.

Therefore,

$$l = 165.5$$

$$h = 3$$

$$f = 142$$

$$f_1 = 118$$

$$f_2 = 127$$

Now,

$$\begin{aligned}
 \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\
 &= 165.5 + \frac{142 - 118}{284 - 118 - 127} \times 3 \\
 &= 165.5 + \frac{24}{39} \times 3 \\
 &= 165.5 + \frac{24}{13} \\
 &= 165.5 + 1.85 \\
 &= 167.35
 \end{aligned}$$

Thus, the average height of maximum number of students is 167.35 cm.

Statistics Ex 7.5 Q7

Answer :

| Age (in years) | 5–15 | 15–25 | 25–35 | 35–45 | 45–55 | 55–65 |
|--------------------|------|-------|-------|-------|-------|-------|
| Number of patients | 6 | 11 | 21 | 23 | 14 | 5 |

Here, the maximum frequency is 23 so the modal class is 35–45.

Therefore,

$$l = 35$$

$$h = 10$$

$$f = 23$$

$$f_1 = 21$$

$$f_2 = 14$$

$$\begin{aligned}
 \Rightarrow \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\
 &= 35 + \frac{2}{46 - 35} \times 10 \\
 &= 35 + \frac{2}{11} \times 10 \\
 &= 35 + \frac{20}{11} \\
 &= 35 + 1.80
 \end{aligned}$$

$$\text{Mode} = 36.8 \text{ years}$$

Thus, the mode of the ages of the patients is 36.8 years.

Calculation for mean.

| Age (in years) | Mid-Values(x) | Number of patients(f) | fx |
|----------------|---------------|-----------------------|--------------------|
| 5-15 | 10 | 6 | 60 |
| 15-25 | 20 | 11 | 220 |
| 25-35 | 30 | 21 | 630 |
| 35-45 | 40 | 23 | 920 |
| 45-55 | 50 | 14 | 700 |
| 55-65 | 60 | 5 | 300 |
| | | $\Sigma f = 80$ | $\Sigma fx = 2830$ |

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f} = \frac{2830}{80} = 35.37$$

Thus, the mean age of the patients is 35.37 years.

The mean age of the patients is less than the modal age of the patients.

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