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,

$$\text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 165.5 + \frac{142 - 118}{284 - 118 - 127} \times 3$$

$$= 165.5 + \frac{24}{39} \times 3$$

$$= 165.5 + \frac{24}{13}$$

$$= 165.5 + 1.85$$

$$= 167.35$$

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,

$l = 35$

$h = 10$

$f = 23$

$f_1 = 21$

$f_2 = 14$

$$\Rightarrow \text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 35 + \frac{2}{46 - 35} \times 10$$

$$= 35 + \frac{2}{11} \times 10$$

$$= 35 + \frac{20}{11}$$

$$= 35 + 1.80$$

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

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
		$\Sigma f = 80$	$\Sigma fx = 2830$

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

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.

********** END **********