



Statistics Ex 7.4 Q5

Answer :

First we prepare the following cumulative table to compute the median.

Marks	No. of Students: (f_i)	Cumulative Frequency ($c.f.$)
0-10	15	15
10-20	20	35
20-30	25	60
30-40	24	84
40-50	12	96
50-60	31	127
60-70	71	198
70-80	52	250
	$N = 250$	

Here, $N = 250$

$$\text{So, } \frac{N}{2} = 125$$

Thus, the cumulative frequency just greater than 125 is 127 and the corresponding class is 50 – 60 .

Therefore, 50 – 60 is the median class.

Here, $l = 50, f = 31, F = 96$ and $h = 10$

We know that

$$\begin{aligned}
 \text{Median} &= l + \left\{ \frac{\frac{N}{2} - F}{f} \right\} \times h \\
 &= 50 + \left\{ \frac{125 - 96}{31} \right\} \times 10 \\
 &= 50 + \frac{29 \times 10}{31} \\
 &= 50 + \frac{290}{31} \\
 &= 50 + 9.35 \\
 &= 59.35
 \end{aligned}$$

Hence, the median is 59.35.

Statistics Ex 7.4 Q6

Answer :

Let the frequency of the class 20–30 be f_1 and that of class 40–50 be f_2 . The total frequency is 170.

So,

$$10 + 20 + f_1 + 40 + f_2 + 25 + 15 = 170$$

$$\text{So, } f_1 + f_2 = 60 \quad \dots\dots(1)$$

It is given that median is 35 which lies in the class 30–40. So 30–40 is the median class.

Now, lower limit of median class (l) = 30

Height of the class (h) = 10

Frequency of median class (f) = 40

Cumulative frequency of preceding median class (F) = $10 + 20 + f_1$

Total frequency (N) = 170

Formula to be used to calculate median,

$$= l + \left(\frac{\frac{N}{2} - F}{f} \right) (h)$$

Where,

l - Lower limit of median class

h - Height of the class

f - Frequency of median class

F - Cumulative frequency of preceding median class

N - Total frequency

Put the values in the above,

$$35 = 30 + \left(\frac{\frac{170}{2} - (30 + f_1)}{40} \right) (10)$$

$$\begin{aligned} f_1 &= -20 + \frac{170}{2} - 30 \\ &= 35 \end{aligned}$$

Using equation (1), we have

$$f_2 = 25$$

Therefore,

$$\boxed{\begin{aligned} f_1 &= 35 \\ f_2 &= 25 \end{aligned}}$$

***** END *****