Median - (6)

To Locate Missing Frequency

Problem:

Find the missing frequency in the following distribution if $N = 100$ and $M = 30$.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	10	?	25	30	?	10

Soln

Two frequencies are missing and let the missing frequencies be denoted by f_1 and f_2. We need two equation, we will get one from summation of frequencies and one from median formula.

Marks	frequency	Cumulative frequency
0-10	10	10
10-20	f_1	$10 + f_1$
20-30	25	$35 + f_1$
30-40	30	$65 + f_1$
40-50	f_2	$65 + f_1 + f_2$
50-60	10	$75 + f_1 + f_2$
	$N = 100$.	

1st equation from summation of frequencies,

$$75 + f_1 + f_2 = 100.$$

$$\Rightarrow f_1 + f_2 = 100 - 75$$

$$f_1 + f_2 = 25 \quad \text{---} (1).$$

From information regarding median,

$$M = 30,$$

and Median Class is 30-40.

Now,

$$M = l + \frac{\frac{N}{2} - C}{f} \times i$$

$$30 = 30 + \frac{\frac{100}{2} - (35 + f_1)}{30} \times 10.$$

$$30 = 30 + \frac{50 - (35 + f_1)}{30} \times 10$$

$$30 = 30 + \frac{50 - 35 - f_1}{30} \times 10$$

$$30 = 30 + \frac{15 - f_1}{30} \times 10$$

$$\therefore 30 - 30 = \frac{15 - f_1}{30}$$

$$15 - f_1 = 0, \quad \therefore f_1 = 15$$

Page No.:
Date:

Putting the value of f_1 in eq (1).

$$f_1 + f_2 = 25$$

$$15 + f_2 = 25$$

$$f_2 = 25 - 15 = 10$$

Thus, $f_1 = 15$, $f_2 = 10$.

Thank You