



Statistics Ex 7.4 Q7

Answer :

Let the frequency of the class 20–30 be f_1 . It is given that median is 35 which lies in the class 20–30.

So 20–30 is the median class.

Now, lower limit of median class (l) = 20

Height of the class (h) = 10

Frequency of median class (f) = f_1

Cumulative frequency of preceding median class (F) = 5 + 25

Total frequency (N) = 55 + f_1

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,

$$24 = 20 + \left(\frac{\frac{(55 + f_1)}{2} - 30}{f_1} \right) (10)$$

$$\frac{4}{10} = \frac{55 + f_1 - 60}{2f_1}$$

$$2f_1 = 50$$

$$f_1 = 25$$

Hence, the required frequency is 25.

Statistics Ex 7.4 Q8

Answer :

(1) Let the missing frequencies be x and y .

No. of accidents: x_i	frequency (no. of days): f_i	$f_i x_i$
0	46	0
1	x	x
2	y	$2y$
3	25	75
4	10	40
5	5	25
	$\sum f_i = 86 + x + y$	$\sum f_i x_i = 140 + x + y$

Given:

$$N = 200$$

$$86 + x + y = 200$$

$$x = 114 - y \quad \dots\dots(1)$$

$$\text{We know that mean, } \bar{X} = \frac{\sum f_i x_i}{\sum f_i}$$

$$1.46 = \frac{140 + x + 2y}{200}$$

$$x + 2y + 140 = 292$$

$$x + 2y = 152 \quad \dots\dots(2)$$

Solving (1) and (2), we get

$$114 - y + 2y = 152$$

$$y = 38$$

Therefore,

$$x = 114 - 38$$

$$= 76$$

Hence, the missing frequencies are 38 and 76.

(2) Calculation of median.

No. of accidents: x_i	Frequency(no. of days): f_i	c.f.
0	46	46
1	76	122
2	38	160
3	25	185
4	10	195
5	5	200
	$\sum f_i = 200$	

Now, we have $N = 200$.

$$\text{So, } \frac{N}{2} = 100$$

Thus, the cumulative frequency just greater than 100 is 122 and the value corresponding to 122 is 1.

Hence, the median is 1.

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