Statistics Ex 7.4 Q12

Answer :

Given: Median = 525

We prepare the cumulative frequency table, as given below.

Class interval:	Frequency: (f_i)	Cumulative frequency $(c.f.)$
0-100	2	2
100-200	5	7
200-300	f_1	$7+f_1$
300-400	12	$19+f_1$
400-500	17	$36+f_1$
500-600	20	$56+f_1$
600-700	f_2	$56+f_1+f_2$
700-800	9	$65+f_1+f_2$
800-900	7	$72+f_1+f_2$
900−1000	4	$76+f_1+f_2$
	$N=100=76+f_1+f_2$	

Now, we have

$$N=100$$

$$76+f_1+f_2=100$$

$$f_2=24-f_1 \quad \text{.....(1)}$$

So, $\frac{N}{2}=50$

Since median = 525 so the median class is $500-600$.

Here, $l=500, f=20, F=36+f_1$ and $h=100$

We know that

$$\text{Median}=l+\left\{\frac{\frac{N}{2}-F}{f}\right\}\times h$$

$$525=500+\left\{\frac{50-(36+f_1)}{20}\right\}\times 100$$

$$25=\frac{(14-f_1)\times 100}{20}$$

$$25\times 20=1400-100f_1$$

$$100f_1=1400-500$$

$$f_1=\frac{900}{100}$$

$$=9$$

Putting the value of f_1 in (1), we get

$$f_2=24-9$$

$$=15$$

Hence, the missing frequencies are 9 and 15.

Statistics Ex 7.4 Q13

Answer :

Given: Median = 32.5

We prepare the cumulative frequency table, as given below.

Class interval:	Frequency: (f_i)	Cumulative frequency $(c.f.)$
0-10	f_1	f_1
10-20	5	$5+f_1$
20-30	9	$14+f_1$
30-40	12	$26+f_1$
40-50	f_2	$26+f_1+f_2$
50-60	3	$29+f_1+f_2$
60-70	2	$31+f_1+f_2$
	$N=40=31+f_1+f_2$	

Now, we have

$$N=40$$

$$31+f_1+f_2=40$$

$$f_2=9-f_1 \quad \text{.....(1)}$$

Also, $\frac{N}{2} = 20$

Since median = 32.5 so the median class is $30-40$.

Here, $l = 30, f = 12, F = 14 + f_1$ and $h = 10$

We know that

$$\text{Median} = l + \left\{\frac{\frac{N}{2} - F}{f}\right\} \times h$$

$$32.5 = 30 + \left\{\frac{20-(14+f_1)}{12}\right\} \times 10$$

$$2.5 = \frac{(6-f_1)\times 10}{12}$$

$$2.5 \times 12 = 60 - 10f_1$$

$$10f_1 = 60 + 30$$

$$f_1 = \frac{30}{10}$$

$$= 3$$

Putting the value of f_1 in (1), we get

$$f_2 = 9 - 3$$

$$= 6$$

Hence, the missing frequencies are 3 and 6.

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