

Statistics Ex 7.5 Q8

Answer:

Lifetimes (in hours)	0-20	20-40	40-60	60-80	80-100	100-120
No. of components	10	35	52	61	38	29

Here, the maximum frequency of electrical components is 61 so the modal class is 60–80.

l = 60

h = 20

f = 61

 $f_1 = 52$

 $f_2 = 38$

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

= $60 + \frac{61 - 52}{122 - 52 - 38} \times 20$
= $60 + \frac{9}{32} \times 20$

Mode = $65.625 \, hrs.$

Thus, the modal lifetimes of the components is 65.625 hours.

Statistics Ex 7.5 Q9

Answer:

Expenditure	Frequency (f;)	Xi	$f_i x_i$
1000-1500	24	1250	30000
1500-2000	40	1750	70000
2000-2500	33	2250	74250
2500-3000	28	2750	77000
3000-3500	30	3250	97500
3500-4000	22	3750	82500
4000-4500	16	4250	68000
4500-5000	7	4750	33250
	$\sum f_i = 200$		$\sum f_i x_i = 532500$

Here, the maximum frequency is 40 so the modal class is 1500-2000.

Therefore,

l = 1500

h = 500

f = 40

 $f_1 = 24$

 $f_2 = 33$

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

$$= 1500 + \frac{40 - 24}{80 - 24 - 33} \times 500$$

$$= 1500 + \frac{16}{23} \times 500$$

$$= 1500 + 347.83$$

$$= \text{Rs} \ 1847.83$$

Thus, the modal monthly expenditure of the families is Rs 1847.83. Now,

Mean monthly expenditure of the families

$$= \frac{\sum f_i x_i}{\sum f_i}$$

$$= \frac{532500}{200}$$

$$= \left[\text{Rs } 2662.50 / - \right]$$

Thus, the mean monthly expenditure of the families is Rs 2662.50.