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.

Therefore,

$l = 60$

$h = 20$

$f = 61$

$f_1 = 52$

$f_2 = 38$

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

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

$$= 60 + \frac{9}{32} \times 20$$

$$\boxed{\text{Mode} = 65.625 \text{ hrs.}}$$

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

Statistics Ex 7.5 Q9

Answer :

Expenditure	Frequency (f_i)	x_i	$f_i x_i$
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

= Rs 1847.83

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

Now,

Mean monthly expenditure of the families

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

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

$$= \boxed{\text{Rs } 2662.50/-}$$

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

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