

Statistics Ex 7.5 Q13

Answer:

The given data is shown below.

Monthly Consumption (in units)	No. of consumers (f _i)	x_i	$f_i x_i$	C.f.
65-85	4	75	300	4
85-105	5	95	475	9
105-125	13	115	1495	22
125-145	20	135	2700	42
145-165	14	155	2170	56
165-185	8	175	1400	64
185-205	4	195	780	68
	$\sum f = 68$		$\sum f_i x_i = 9320$	

Here, the maximum frequency is 20 so the modal class is 125-145.

Therefore

$$l = 125$$

$$h = 20$$

$$f = 20$$

$$f_1 = 13$$

$$f_2 = 14$$

$$\Rightarrow \text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$
$$= 125 + \frac{7}{13} \times 20$$
$$= 125 + \frac{140}{13}$$

Mode = 135.76 units

Thus, the mode of the monthly consumption of electricity is 135.76 units.

Mean =
$$\frac{\sum f_i x_i}{\sum f} = \frac{9320}{68} = 137.05$$

Thus, the mean of the monthly consumption of electricity is 137.05 units. Here,

Total number of consumers, N = 68 (even)

Then,
$$\frac{N}{2}=34$$

: Median

$$= l + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 125 + \frac{\frac{68}{2} - 22}{20} \times 20$$

$$= 125 + \frac{34 - 22}{20} \times 20$$

$$= 125 + 12$$

$$= 137$$

Thus, the median of the monthly consumption of electricity is 137 units.

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