Statistics Ex 7.5 Q14

Answer :

Consider the following table.

Number of letters	No. of surname	x_i	$f_i x_i$	C.f.
1–4	6	2.5	15	6
4–7	30	5.5	165	36
7–10	40	8.5	340	76
10–13	16	11.5	184	92
13–16	4	14.5	58	96
16–19	4	17.5	70	100
	$N=\sum f=100$		$\sum f_i x_i=832$	

Here, the maximum frequency is 40 so the modal class is 7–10.

Therefore,

$l=7$

$h=3$

$f=40$

$f_1=30$

$f_2=16$

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

$$=7+\frac{10}{34}\times 3$$

$$=7+\frac{30}{34}$$

$$\boxed{\text{Mode}=7.88}$$

Thus, the modal sizes of the surnames is 7.88.

$$\text{Mean}=\frac{\sum f_i x_i}{\sum f}$$

$$=\frac{832}{100}$$

$$\boxed{\text{Mean}=8.32}$$

Thus, the mean number of letters in the surnames is 8.32.

Median

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

$$= 7 + \frac{50 - 36}{40} \times 3$$

$$= 7 + \frac{{}^{7}\cancel{14}}{\cancel{40}_{20}} \times 3$$

$$= 7 + \frac{21}{20}$$

$$\boxed{\text{Median} = 8.05}$$

Thus, the median number of letters in the surnames is 8.05.

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