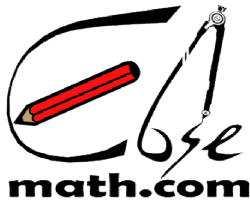


**NCERT Maths Class X-Statistics Ex 14.3 – Question 6**  
**Solutions by Dev Anoop (Bathinda)**



Number of letters	number of surnames $f_i$	Cumulative frequency	Class marks $X_i$	$u_i = \frac{x_i - a}{h}$	$f_i u_i$
1-4	6	6	2.5	-2	-12
4-7	30	36	5.5	-1	-30
7-10	40	76	8.5	0	0
10-13	16	92	11.5	1	16
13-16	4	96	14.5	2	8
16-19	4	100	17.5	3	12

Now,  $n = 100$

So,  $\frac{n}{2} = \frac{100}{2} = 50$

This observation lies in the class 7- 10.

So, 7 – 10 is the median class.

Therefore,  $l = 7, h = 3, f = 40, cf = 36$

$$\begin{aligned} \therefore \text{Median} &= l + \left( \frac{\frac{n}{2} - cf}{f} \right) \times h = 7 + \left( \frac{50 - 36}{40} \right) \times 3 \\ &= 7 + \frac{21}{20} = 7 + 1.05 = 8.05 \end{aligned}$$

Hence, the median number of letters in the surnames is 8.05

Using the step-deviation method.

$$\begin{aligned} \bar{x} &= a + \left( \frac{\sum f_i u_i}{\sum f_i} \right) \times h = 8.5 + \left( \frac{-6}{100} \right) \times 3 \\ &= 8.5 - 0.18 = 8.32 \end{aligned}$$

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Hence, the mean number of letters in the surnames is 8.32

Mode. Since the maximum number of surnames have number of letters in the interval 7-10, the modal class is 7-10.

Therefore  $l = 7, h = 3, f_1 = 40, f_0 = 30, f_2 = 16$

$$\begin{aligned}\therefore \text{Mode} &= l + \left( \frac{f_1 - f_0}{2f_1 - f_2 - f_0} \right) \times h = 7 + \left( \frac{40 - 30}{2 \times 40 - 30 - 16} \right) \times 3 \\ &= 7 + \frac{30}{34} = 7 + 0.88 = 7.88\end{aligned}$$

Hence, the modal size of the surnames is 7.88.