

## Chapter 6 – Measures of Central Tendency- Median & Mode

### Question 1

Find out the median.

S. No.	1	2	3	4	5	6	7	8	9
Marks Obtained	10	12	14	17	18	20	21	30	32

### Answer:

10, 12, 14, 17, 18, 20, 21 30, 32

$$N = 9$$

$$\text{Median} = \left( \frac{N+1}{2} \right)^{\text{th}}$$

$$\text{Median} = \left( \frac{9+1}{2} \right)^{\text{th}} = 5^{\text{th}} \text{ item}$$

Therefore, the median is given by the size of the 5<sup>th</sup> items. Therefore, the Median of the data so given is 18.

### Question 2

Calculate the value of median from the following data:

Income	12,00	1,800	5,000	2,500	3,000	1,600	3,500
No. of Persons	12	16	2	10	3	15	7

### Answer:

Income	Number of People (f)	Cumulative Frequency (c.f.)
1200	12	12
1600	15	27
1800	16	43
2500	10	53
3000	3	56
3500	7	63
5000	2	65
	N=65	

Median = size of  $\left(\frac{N+1}{2}\right)^{\text{th}}$  item

$$\text{Median} = \frac{65+1}{2} = 33^{\text{rd}}$$

While locating the item in the Cumulative Frequency column, the item that exceeded 33rd is 43 that is corresponding to 1800. Thus, the median is 1800.

### Question 3

Find out the median size from the following:

X	160	150	152	161	156
f	5	8	6	3	7

**Answer:**

X	f	Cumulative Frequency (cf)
150	8	8
152	6	14
156	7	21
160	5	26
161	3	29
	N=29	

Median = size of  $\left(\frac{N+1}{2}\right)^{\text{th}}$  item

$$\text{Median} = \frac{29+1}{2} = 15^{\text{th}}$$

When locating the item in Cumulative Frequency column. The item that exceeded 15th is 21 corresponding to 156. Therefore, median is 156.

### Question 4

Evaluate lower quartile and upper quartile from the following series.

Variable	5	10	15	20	25	30	35	40
Frequency	16	18	22	21	24	14	11	9

**Answer:**

Variable	Frequency ( <i>f</i> )	Cumulative Frequency ( <i>c.f.</i> )
5	16	16
10	18	34
15	22	56
20	21	77
25	24	101
30	14	115
35	11	126
40	9	135
	<i>N</i> =135	

$$Q_1 = \text{size of } \left( \frac{N+1}{4} \right)^{\text{th}} \text{ item}$$

$$\text{Or, } Q_1 = \text{size of } \left( \frac{135+1}{4} \right)^{\text{th}} \text{ item}$$

$$= Q_1 = 34^{\text{th}} \text{ item}$$

Upper Quartile

$$Q_3 = \text{size of } 3 \left( \frac{N+1}{4} \right)^{\text{th}} \text{ item}$$

$$\text{Or, } Q_3 = \text{size of } 3 \left( \frac{135+1}{4} \right)^{\text{th}} \text{ item}$$

$$= Q_3 = 102^{\text{nd}} \text{ item}$$

This corresponds to 115 in the cumulative frequency.

Hence, upper quartile is 30.

### Question 5

Age of 11 students of class XI is given below. Find the modal age by: (i) Observation Method; (ii) Frequency distribution Method.

Age (in years)	15	16	16	17	15	16	18	17	15	17	17
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ANSWER:

Age (X)	Tally Marks	Frequency ( <i>f</i> )	
15	III	3	
16	III	3	
17	IIII	4	Modal Class
18	I	1	



Since 17 occurs the highest number of times in the series i.e. 4 times.

Hence, Mode = 17