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

$N = 9$

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

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

Therefore, the median is given by the size of the 5^{th} 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 1600	12 15	12 27
1800	16	43
2500 3000 3500 5000	10 3 7 2	53 56 63 65
	N=65	

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

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

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)***
150 152	8 6	8 14
156	7	21
160 161	5 3	26 29
	N=29	

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

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

When locating the item inCumulative Frequency coloumn. 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 (*f*)	Cumulative Frequency (*c.f.*)
5	16	16
10	18	34
15	22	56
20	21	77
25	24	101
30	14	115
35	11	126
40	9	135
	N=135	

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

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

= $Q_1 = 34^{th}$ item

Upper Quartile

Q_1 = size of 3 $\left(\frac{N+1}{4}\right)^{th}$ item

Or, Q_1 = size of 3 $\left(\frac{135+1}{4}\right)^{th}$ item

= $Q_1 = 102^{nd}$ 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

ANSWER:

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

		$N=11$	

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

Hence, Mode = 17