4.14 MODE

Mode is that value in a series which occurs most frequently. In a frequency distribution mode is that variate which has the maximum frequency. In other words, **mode represents that value which is most frequent or typical or predominant.** Mode is also known as **Norm.**

For example, in the series 6, 5, 3, 4, 3, 7, 8, 5, 9, 5, 4; we notice that 5 occurs most frequently, therefore, **5 is the mode.**

Example 39. *A shoe shop in Delhi had sold 100 pairs of shoes of a particular brand on a certain day with the following distribution:*

Size of Shoe	*4*	*5*	*6*	*7*	*8*	*9*	*10*
No. of Pairs	*10*	*15*	*20*	*35*	*16*	*3*	*1*

Find the mode of the distribution.

Solution. Let us prepare the table showing the frequency.

Size of Shoe	4	5	6	7	8	9	10
Frequency	10	15	20	35	16	3	1

In the above table, we notice that the size 7 has the maximum frequency, *viz.*, 35.

Therefore, **7 is the mode of the distribution.**

4.15. TYPES OF MODEL SERIES

A series of observations may have one or more modes.

Unimodal series. ***The series of observations which contains only one mode, is called unimodal series.***

Bimodal series. ***The series of observations which contains two modes is called a bimodal series. In this series, the two modes are of same value of greatest density.***

Trimodal series. ***The series of observations which contains three modes is called a trimodal series.*** **In this series, the three modes are of same value of greatest density and highest concentration of observations.**

Ill-defined Mode. ***If a series of observations has more than one mode then the mode is said to be ill-defined.***

4.16 COMPUTATION OF MODE

4.16.1 Simple Series

In the case of **simple series**, the value which is repeated maximum number of times is the **mode of the series.**

Example 29. *In Rajdhani Rubber Industry, Tilak Nagar, New Delhi seven labourers are receiving the daily wages of Rs. 5, 6, 6, 8, 8, 8 and 10. Find the modal wage.*

Solution. In the series 5, 6, 6, 8, 8, 8, 10; since 8 occurs thrice and no other item occurs three times or more than three times and hence the modal wage is **Rs. 8.**

4.16.2 Discrete frequency distribution series

In the case of discrete frequency distribution, **mode is the value of the variable corresponding to the maximum frequency.**

Example 40. *A set of numbers consists of four 4's, five 5's, six 6's and nine 9's. What is the mode?*

Solution. Let us prepare the following frequency table.

Size of item:	4	5	6	9
Frequency:	4	5	6	9

Since 9 has the maximum frequency, *viz.*, 9, therefore, **9 is the mode.**

4.16.3 Computation of Mode by Grouping Method

We notice that, in discrete series, mode is determined by inspection and, therefore, an error of judgement is possible in those cases where the **difference between the maximum frequency and the frequency preceding or succeeding it is very small and the items are heavily concentrated on either side.** Under such circumstances the value of mode is determined by preparing **a grouping table and analysis table.**

GROUPING TABLE

A grouping table has the following six columns.

Column I. *It has original frequencies and the maximum frequency is marked by bold type.*

Column II. *In this column the frequencies of column 1 are combined 'two by two'. (1 and 2; 3 and 4; 5 and 6; and so on). Here also the maximum frequency is marked by bold type.*

Column III. *Here, we leave the first frequency of the column I and combine the others in 'two by two' (2 and 3; 4 and 5; 6 and 7; and so on). Again the maximum frequency is marked by bold type.*

Column IV. *In this column the frequencies of the column I are combined (grouped) in 'three by three' (1, 2 and 3; 4, 5 and 6; 7, 8 and 9; and so on). And again the maximum frequency is marked by bold type.*

Column V. *Here we leave the first frequency of the column I and group the others in 'three by three' (2, 3 and 4; 5, 6 and 7; 8, 9 and 10; and so on). Again mark the maximum frequency by bold type.*

Column VI. *Now leave the first two frequencies of column I and combine the others in 'three by three'. (3, 4 and 5; 6, 7 and 8; 9, 10 and 11; and so on). Mark the maximum frequency by bold type.*

ANALYSIS TABLE

After preparing the grouping table, we prepare the **analysis table.** While preparing this table we put the ***column numbers on the left-hand side and the various probable values of the mode on the right-hand side. The values against which frequencies are maximum marked in the grouping table and are entered by means of a bar in the relevant 'box' corresponding to the values they represent.***

The procedure of preparing a grouping table and analysis table shall be clear from the following example:

Example 41. *Calculate the mode from the following frequency distribution:*

Size (x)	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
Frequency (f)	*2*	*5*	*8*	*9*	*12*	*14*	*14*	*15*	*11*	*13*

Solution. We find that the value 11 of the variable x occurs maximum numbers of times, *i.e.*, 15. But we also notice that the difference between the frequencies of the values of the variable, on both sides of 15, which are very closed to 11 is very small. This shows that the values of the variable x are heavily concentrated on either side of 11. Therefore, if we find mode just by inspection, **an error is possible.**

This problem is solved by **the method of grouping as it is an irregular distribution** in the sense that the difference between maximum frequency 15 and frequency preceding it is very small. Let us prepare the grouping and analysis table.

GROUPING TABLE

		Grouping				
	(*I*)	(*II*)	(*III*)	(*IV*)	(*V*)	(*VI*)
Size (*x*)	*Frequency* (*f*)	*Col. of two*	*Col. of two leaving the first*	*Col. of three*	*Col. of three leaving the first*	*Col. of three leaving the first two*
4	2	7				
5	5		13	15		
6	8	17			22	
7	9		21			29
8	12	26		35		
9	14		28		40	
10	14	29				43
11	15		26	40	39	
12	11	24				
13	13					

Let us now prepare the **Analysis Table.**

ANALYSIS TABLE

X → / ↓ Col. No.	4	5	6	7	8	9	10	11	12	13
I								I		
II							I	I		
III						I	I			
IV							I	I	I	
V					I	I	I			
VI						I	I	I		
Total Frequency					1	3	5	4	1	

From the analysis table, it is clear that the **value 10 has the maximum number of bars, *i.e.*, maximum frequency, *viz.*, 5. Hence, the modal value is 10.**