Unit 3: Measures of Central Tendency

Business Statistics – B.Com

Simple Theory, Formula & Numerical Examples

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3.1 Meaning of Central Tendency

- • Central Tendency means a single value that represents the whole data.
- • It shows the central or typical value of a data set.
- • Also called Averages.
- • Helps in comparison and decision making.

Types of Averages

- • Arithmetic Mean
- • Median
- • Mode
- These are the most commonly used measures of central tendency.

3.2 Arithmetic Mean – Definition

- • Arithmetic Mean is the sum of all observations divided by number of observations.
- • It is the most popular average.

- Formula:
- Mean ($\bar{X}$) = $\Sigma X / N$

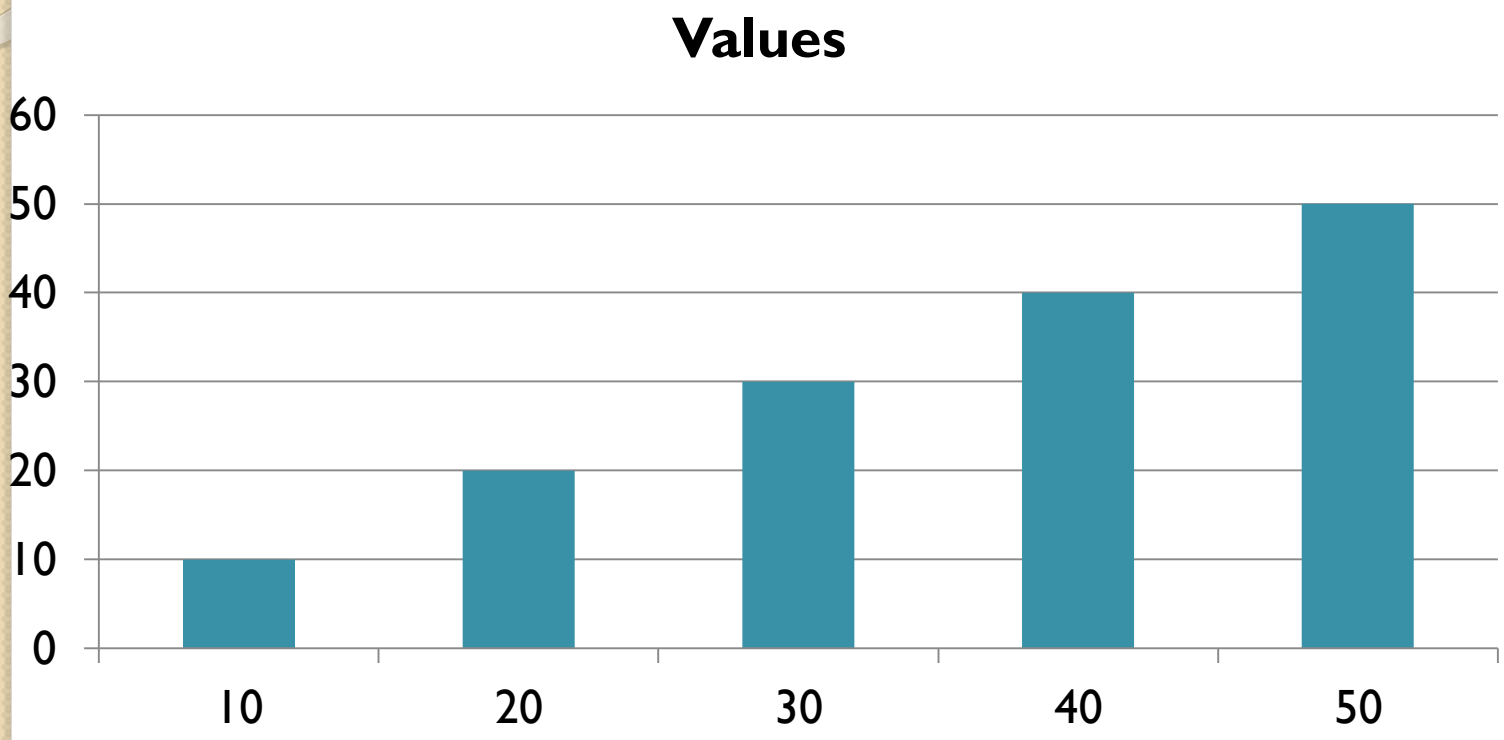
Example of Arithmetic Mean

- Marks: 10, 20, 30, 40, 50

- $\Sigma X = 150$
- $N = 5$

- Mean = 150 / 5 = 30

Arithmetic Mean – Diagram



Merits & Demerits of Mean

- Merits:
- • Easy to calculate
- • Based on all observations
- • Useful for further analysis

- Demerits:
- • Affected by extreme values
- • Not suitable for open-end classes

Combined Mean

- • Used when two or more groups are combined.

- Formula:
- Combined Mean = $(n_1\bar{x}_1 + n_2\bar{x}_2) / (n_1 + n_2)$

- Where n = number of items

3.3 Median – Definition

- • Median is the middle value of a series.
- • Data must be arranged in ascending or descending order.

- Formula:
- Median = (N+1)/2th item

Example of Median

- Data: 5, 10, 15, 20, 25
- N = 5

- Median position = (5+1)/2 = 3rd item
- Median = 15

Merits & Demerits of Median

- Merits:
- • Not affected by extreme values
- • Suitable for skewed data

- Demerits:
- • Not based on all observations
- • Not suitable for further algebraic treatment

3.4 Mode – Definition

- • Mode is the value that occurs most frequently.
- • Shows the most common value.

- Example:
- 2, 4, 6, 6, 6, 8 → Mode = 6

Merits & Demerits of Mode

- Merits:
- • Easy to understand
- • Not affected by extreme values

- Demerits:
- • Not rigidly defined
- • May have more than one mode

Numerical Problems (Practice)

- 1) Find Mean of: 12, 15, 18, 20, 25
- 2) Find Median of: 3, 7, 9, 11, 13
- 3) Find Mode of: 5, 7, 7, 9, 10

Conclusion

- • Mean, Median and Mode are important averages.
- • Mean is mathematical average.
- • Median is positional average.
- • Mode shows most frequent value.
- • Choice depends on nature of data.