Chapter: Measures Of Central Tendancy

Statistical Average:

Central Tendency refers to a central value or a representative value of a statistical series. Central Tendency of data is called Statistical average because the Individual variable values concentrate around it.

Types Of statistical Average or Measures Of Central Tendency

1. Simple Arithmetic Mean
2. Weighted Arithmetic Mean
3. Median
4. Mode
5. Geometric Mean
6. Harmonic Mean

Arithmetic Mean

Arithmetic Mean is the most popular and useful Measures Of Central Tendency. Arithmetic Mean is a Number which can be obtained by dividing the total values of different items in the series by their total Number.

Types Of Arithmetic Mean

- Simple Arithmetic Mean ($\bar{x}$)
- Weighted Arithmetic Mean ($\bar{x}_w$)

Calculation of Simple Arithmetic Mean

Simple Arithmetic Mean or Mean ($\bar{x}$) can be Computed by generally Two or Three Methods.

Individual Series

Direct Method

$$\bar{x} = \frac{\Sigma x}{N}$$

Step (1) To Add all the observations of a series i.e. $x_1 + x_2 + x_3 \cdots x_n$ & denoted by Σx

(2) Find out Total Number of observations in the series i.e. & denoted by N

where

i) $\bar{x}$ is symbol of Mean & read x bar

ii) Σ = Total of Summation & read 'Sigma'

Question on Individual Series by direct Method

Q(1) The Monthly expenditure (in ₹) of five menare as follows:
130, 140, 150, 160, 170
Find out Simple Arithmetic Mean

Solution — By Direct Method

Expenditure (₹) X
130
140
150
160
170
$\Sigma X = 750$

$N = 05$

$$\text{Mean}(\bar{x}) = \frac{\Sigma x}{N}$$

$$= \frac{750}{5}$$

$$= ₹ 150$$

Individual Series...

Short Cut Method / Assumed Mean Method

$$\bar{X} = A + \frac{\Sigma dx}{N}$$

Step for Calculation

1. Take any Number as the assumed Mean and denoted it as 'A'
2. To find deviation from X − A (Variables − Assumed Mean) and denote as dx
3. Total Sum of deviation is called Σdx
4. To find out Total Number of observation in the series

Solution of Individual series by Short cut Method of Q No (1)

Expenditure (₹) X	A = 140 dx (X − A)
130	−10
140	0
150	+10
160	+20
170	+30
	+60
	−10
	+50
	Σdx

By Short Cut Method

$$\bar{x} = A + \frac{\Sigma dx}{N}$$

$$= 140 + \frac{50}{5}$$

$$= 140 + 10$$

$$= ₹150$$

Ans ✓