CHAPTER – 14
STATISTICS

14.1 INTRODUCTION

The branch of science known as **statistics** has been used in India from ancient times. Statistics deals with collection of numerical facts. i.e. data, their classification & tabulation and their interpretation.

MEASURES OF CENTRAL TENDANCY:
The commonly used measure of central tendency (or averages) are :

(i) **Arithmetic Mean (AM)** or **Simply Mean**
(ii) **Median**
(jjj) **Mode**

ARITHMETIC MEAN:

Arithmetic mean of a set of observations is equal to their sum divided by the total number of observations.

Mean of raw data: $x_1, x_2, x_3, ..., x_n$ are the **n** values (or observations) the,

A.M. (Arithmetic mean) is

$$\bar{x} = \frac{x_1 + x_1 + ... + x_n}{n} = \frac{\sum_{i=1}^{n} x_i}{n}$$

$n\bar{x}$ - Sum of observations $= \frac{\sum_{i=1}^{n} x_i}{n}$

i.e. product of mean & no. of items gives sum of observation.

Ex.1 The mean of marks scored by 100 students was found to be 40. Later on its was discovered that a score of 56 was misread as 83. Find the correct mean.

Sol. n = 100, $\bar{x} = 40$

$$\bar{x} = \frac{1}{n}\left(\sum x_i\right) \quad \Rightarrow \quad 40 = \frac{1}{100}\left(\sum x_i\right)$$

$\therefore$ Incorrect value of $\sum x_i = 4000.$

Now, Correct value of $\sum x_i =$ 4000 - 83 + 83 = 3970

$\therefore$ Correct mean $= \frac{\text{correct value of } \sum x_i}{n} = \frac{3970}{100} = 39.7$

So, the correct mean is 39.7