

Ans 8 A] VARIANCE :

Measures of central tendency, are in the form of an average. An average is a single value which represents a set of values in a distribution.

The measures of central tendency - mean, median and mode are based on the real value of items of a series are called Averages of the first order. The measures of variation are called Averages of Second Order.

A.L. Browley says that dispersion is the measure of the variations of the items. Dispersion signifies variability of a series and its precise measure is quite indispensable.

In short, to study dispersion, deviations of the size of items from the central tendency are calculated and averaged so as to give an additional

knowledge about the formation and composition of the given series. Since, the deviations on the basis of central position, are to be averaged, it is known as Averages of the second order.

An average by itself has little significance unless the degree of variation in the distribution is known. If the variation is small, an average becomes meaningful and useful; and if the variation is large, the average has only limited significance.

In brief, dispersion is a lack of uniformity in the sizes of items of group and is useful for ascertaining to what extent the average is typical or representative.

B] COEFFICIENT OF VARIATION

The standard deviation is an absolute measure of dispersion. It is expressed in terms of units in which the original figures are collected and stated.

The standard deviation of heights of students cannot be compared with the standard deviation of weights; as both are expressed in different units i.e. heights in metres and weights in kilograms.

Therefore, the standard deviation must be converted into a relative measure of dispersion for the purpose of comparison.

The relative measure is known as the Coefficient of Variation.

Variance : Square of standard deviation is called variance.

Symbolically, $\text{Variance} = \sigma^2$

$$\sigma = \sqrt{\text{Variance}}$$

$$\text{Coefficient of standard deviation} = \frac{\sigma}{\bar{X}}$$

In the above formula, coefficient of standard deviation will be in fraction and as such not very good for comparison. Therefore, the coefficient of standard deviation is multiplied by 100 gives the coefficient of variation.

Symbotically,

$$\text{Coefficient of Variation (C.V)} = \frac{\sigma}{\bar{x}} \times 100.$$