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CORE CONCEPT OF

BUSINESS MATHMATICS & STATISTICS

1. What is the Cyclical Fluctuation?
2. Illustrate the Seasonal Variation.
3. Briefly describe the Trend or Secular Trend.
4. What do you mean by Long term Movement?
5. What is Regular short time fluctuation?
6. Point out the Irregular or Random Fluctuations.

TIME SERIES ANALYSIS

Time series analysis refers to such a series in which statistical data are presented on the basis of time of occurrence or in a chronological order. The measurement of time may be either year, month, week, day, hour or even minutes or seconds.

Definition—

1) "A set of data depending on the time is called a time series."- Kenny & Kieping
2) "A time series is a sequence of values of the same variate corresponding to successive point in time.'- Werner Z. Hirsch

COMPONENTS OF A TIME SERIES

The main components of time series may be classified as shown below-

Original Data (O or Y)

A) Long term Movement or Trend or Secular Trend (T)

B) Short- Time Fluctuations

1) **Regular short time fluctuation(S+C)**

   a) Seasonal Variation (S)

   b) Cyclical Fluctuation (C)

2) **Irregular or Random Fluctuations (I)**

A) **Long term Movement or Trend or Secular Trend (T)-**Trend refers to that tendency which indicates the general direction of fluctuation in a long period. According to Simpson and Kafka, "Trend also called secular or long term trend, is the basic tendency of production, sales, income, employment, or the like to grow or decline over a period of time. The concept of trend does not include short range oscillations but, rather, steady movements over a long time."

B) **1) Regular short time fluctuation(S+C)-** The variations arising out on account of such regular or periodical repetitions are called regular short time oscillation, which may of two type-

a) **Seasonal Variation-** Seasonal variations refer to such movements which are regular and repetitive and which operate in a regular and periodic manner over a span of less than a year. This span may be a day, week, month, half-year, etc.

b) **Cyclical Fluctuation-**It also occurs periodically like seasonal variations, but the period of their reoccurrence is more than a year. It is called cyclical because they occur in cyclical nature and in this cycle there are four stages- (i) Prosperity, (ii) Recession, (iii) Depression, (iv) Recovery.

2) Irregular or Random Fluctuations (I)- Irregular or random fluctuations occur accidently in time series. For instance, decline in profits due to break of fire in the factory in a particular year, decrease in production due to sudden strike or scarcity of petroleum product due to war, etc.