4.0 Analysis the Time Dependent Variables and Forecasts.

4.1 Studies the Variations Contained in a Time Dependent variable.

What is a Time seris ?

Time seris is a sequence of well defined data points measured at constant time intervals

Example.

(i) Daily production of a company during last month.

(ii) monthly sales of a company during last 2 years.

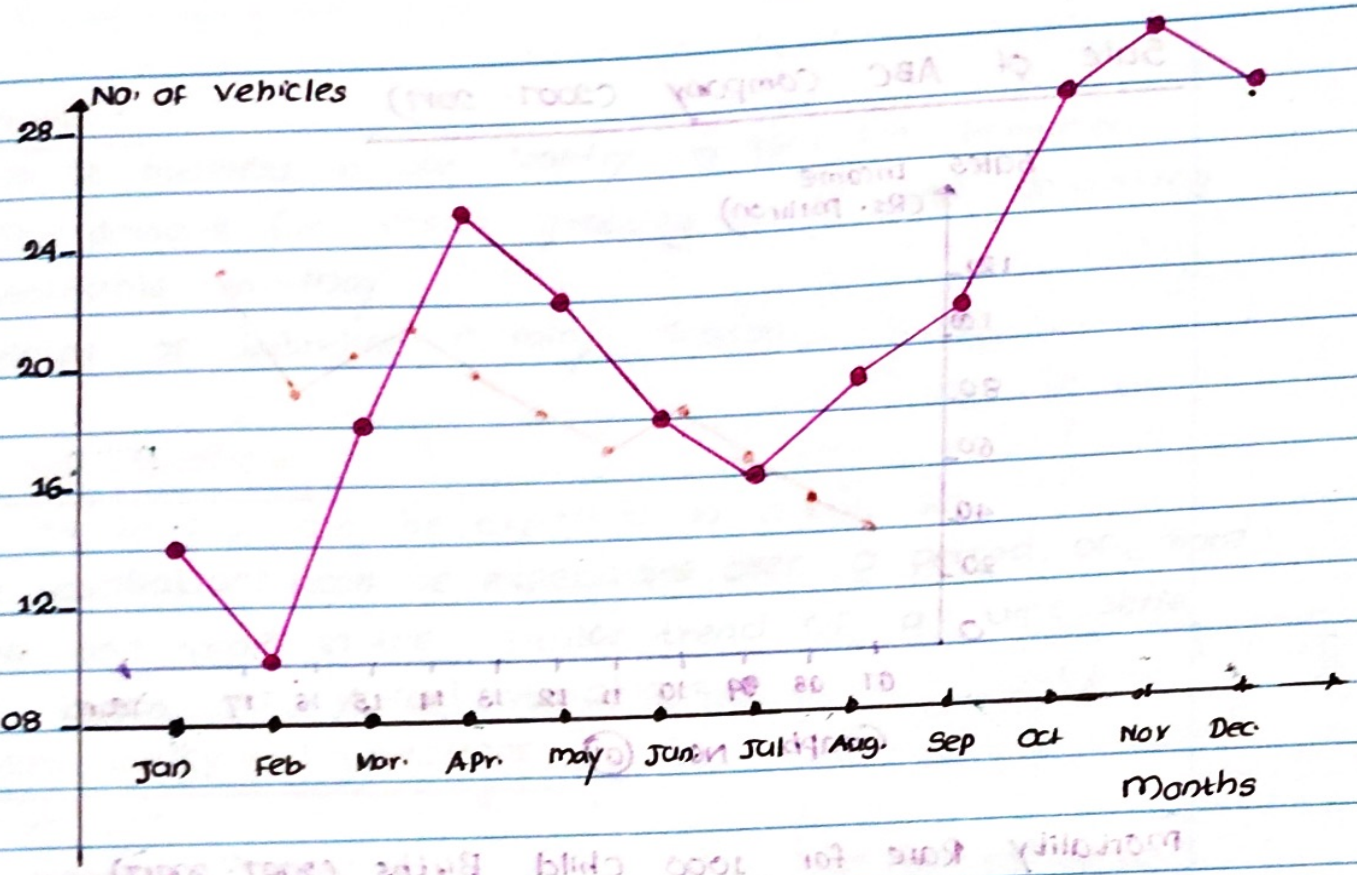
Graph of a Time Seris.

The relevant time unit (Independent variable) is represented on the horizontal axis, where as the considered time seris variable on the vertical axis.

Example.

Number of cars, imported by Subagaman company Ltd which is involved in importing and selling motor vehicles is mentioned in the following table. Represent them as a time seris graph.

month	Jan	Feb	Mar.	Apr.	may	June	July	Aug	Sep.	Oct	Nov	Dec
No: of Cars	14	10	18	25	22	18	16	19	21	28	30	36



Components for Time Seris Analysis

All the factors causing for the movement of a time seris can be classified as follows.

(i) Long Term Trend (T)
(ii) Seasonal Variations (S)
(iii) Cyclical Variations (C)
(iv) Irragular Variations (I)

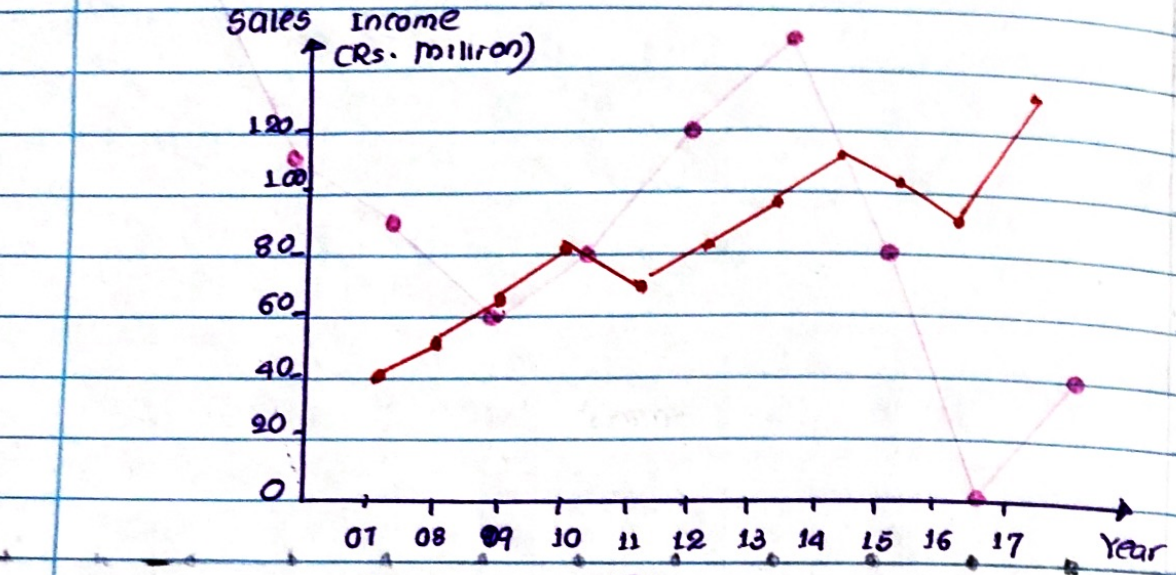
Long Term Trend.

The overall direction of a time seris variable that has moved in long run despite the short term fluctuations is known as long term trend.

Example.

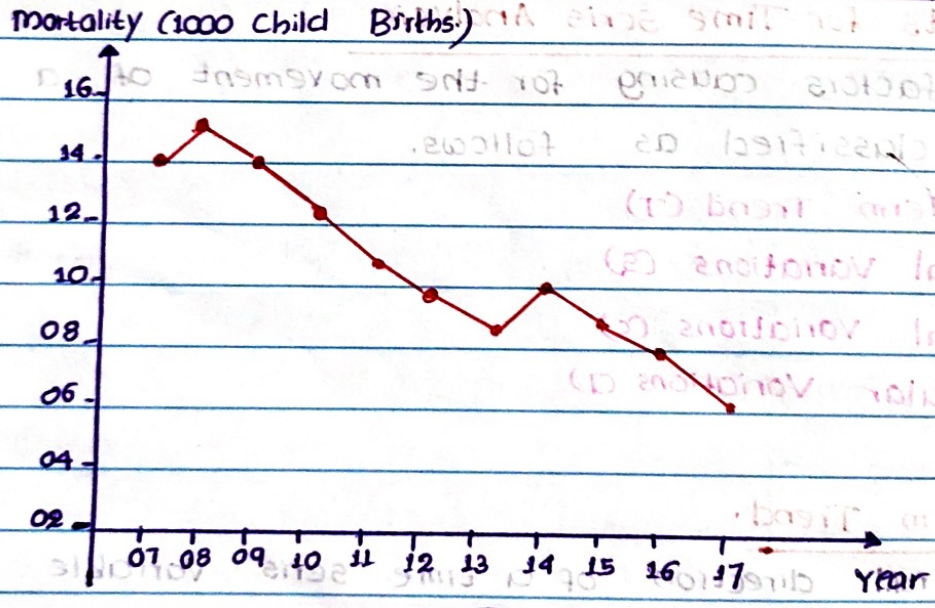
(i) There is an increasing trend in the sales income of ABC Company (Graph No: 01)
(ii) There is a declining trend in mortality rate of child birth (Graph No: 02)

Sale of ABC Company (2007 - 2017)



Graph No: (01)

Mortality Rate for 1000 Child Births (2007 - 2017)



Graph No: (02)

Seasonal variations.

The variations take place in a time series variable repeatedly once in an equal length interval during a period of less than one year are known as seasonal variations. Such variations can be expected owing to the biological and cultural changes in a country.

Example.

(i) Textile business in our coabtry in April and December.

(ii) The demand for Vesak greeting cards and decorating materials in may.

(iii) Sales of arobrellas in rainy seasoo.

Cyclical Variations.

The oscillations can be expected in a time seris

The oscillatrons can be expected over a period of more than one year in the secular trend of a time seris are known as cyclical variations.

Reasons for Cyclical variations.

(i) Civil coor

(ii) Economical Policies.

(iii) Political Crisis.

(iv) Long term changes in consumer taste.

Irragular Variations

A sudden movements of the time seris variable is known as irragular variations.

Resons for Irragular Varrations

(i) Natural Disasters.

(ii) Strike of workers.

Models used for Time Seris Analysis

There are two models which are used in time seris analysis as:

(i) Additive Model

(ii) Multipicative model.

Additive Model.

Stating the total value of time series variable is derived as the sum of four components such as the Trend (T), Seasonal Variations (S) Cyclical variations (C) and Irragular variations (I) is the additive Model.

$$Y = T + S + C + I$$

The value of one component can be derived as follows.

$$Y = T + S + C + I$$

$$S = Y - (T + C + I)$$

Multipicative Model.

Stating the total value of the time series variable is derived as product of the four time series components is the Multipicative model.

$$Y = T \times S \times C \times I$$

The value of any one of these components can be derived as follows.

$$Y = T \times S \times C \times I$$

$$S = \frac{Y}{T \times C \times I}$$