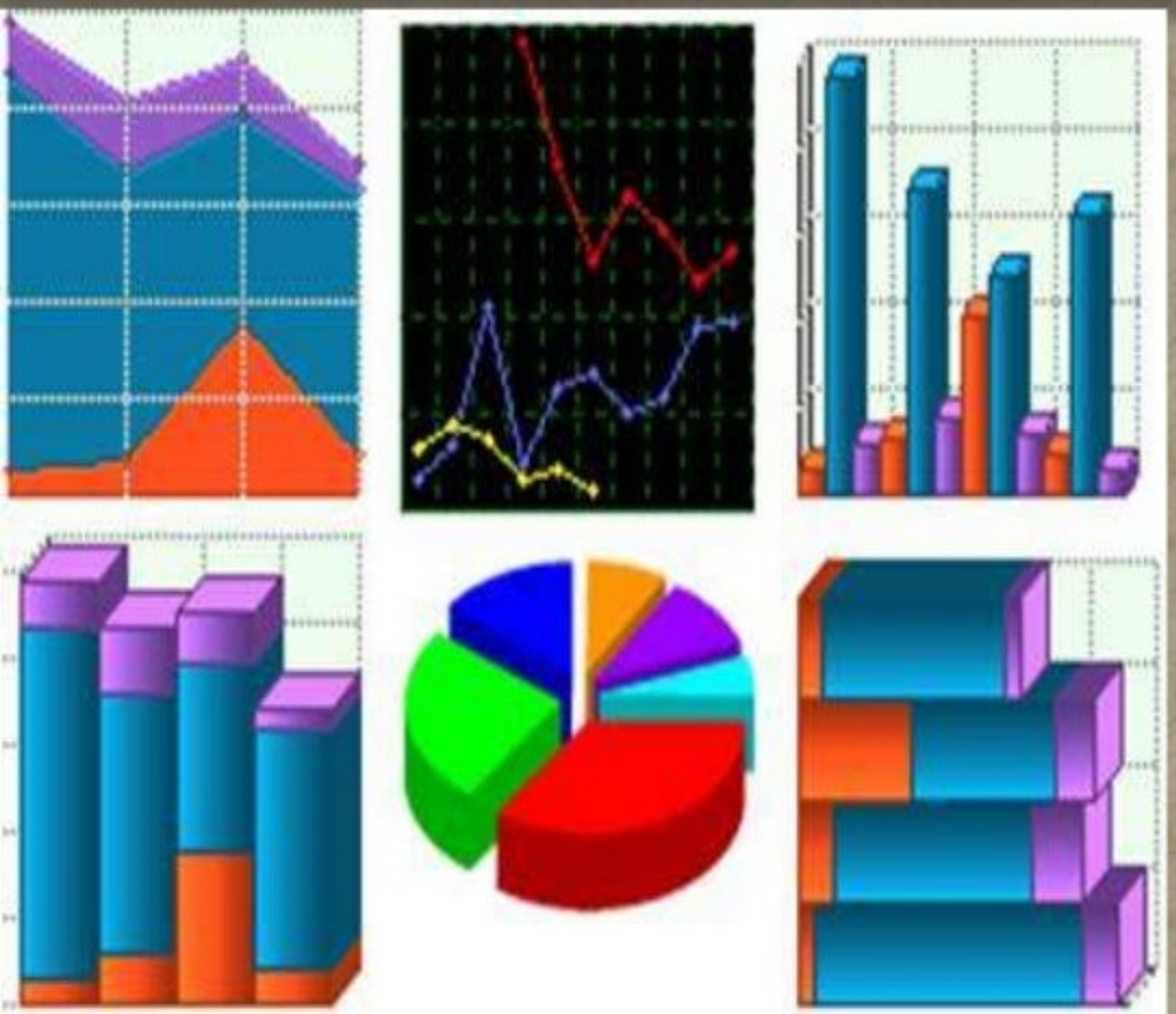
GRAPHICAL REPRESENTATION OF DATA



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INTRODUCTION

- **Graphical Representations of Data**
- "The transformation of data through visual methods like graphs, diagrams, maps and charts is called representation of data."
- Visualization techniques are ways of creating and manipulating graphical representations of data. We use these representations in order to gain better insight and understanding of the problem.
- Pictures can convey an overall message much better than a list of numbers. Lets we now discuss some graphical presentations of data.

Types of Graphical Representations of data

1. GRAPHS OF FREQUENCY DISTRIBUTION

2. GRAPHS OF TIME SERIES OR LINE GRAPHS

1. Graphs of frequency distribution

Frequency distribution can be represented graphically. Such as graphs give a better picture when the data are arranged in tabular form. Types of Frequency distribution graphs.

- The Histogram
- The Frequency Polygon
- The Frequency Curve
- Cumulative Frequency curve.

Types of Diagrams

- The diagrams are of following types:
- (i) One-dimensional diagrams such as line graph, poly graph, bar diagram, histogram etc.
- (ii) Two-dimensional diagram such as pie diagram and rectangular diagram.
- (iii) Three-dimensional diagrams such as cube and spherical diagrams.

The most commonly drawn diagrams are:

1. Line graphs 2. Bar diagrams 3. Pie diagram

1. Line Graphs

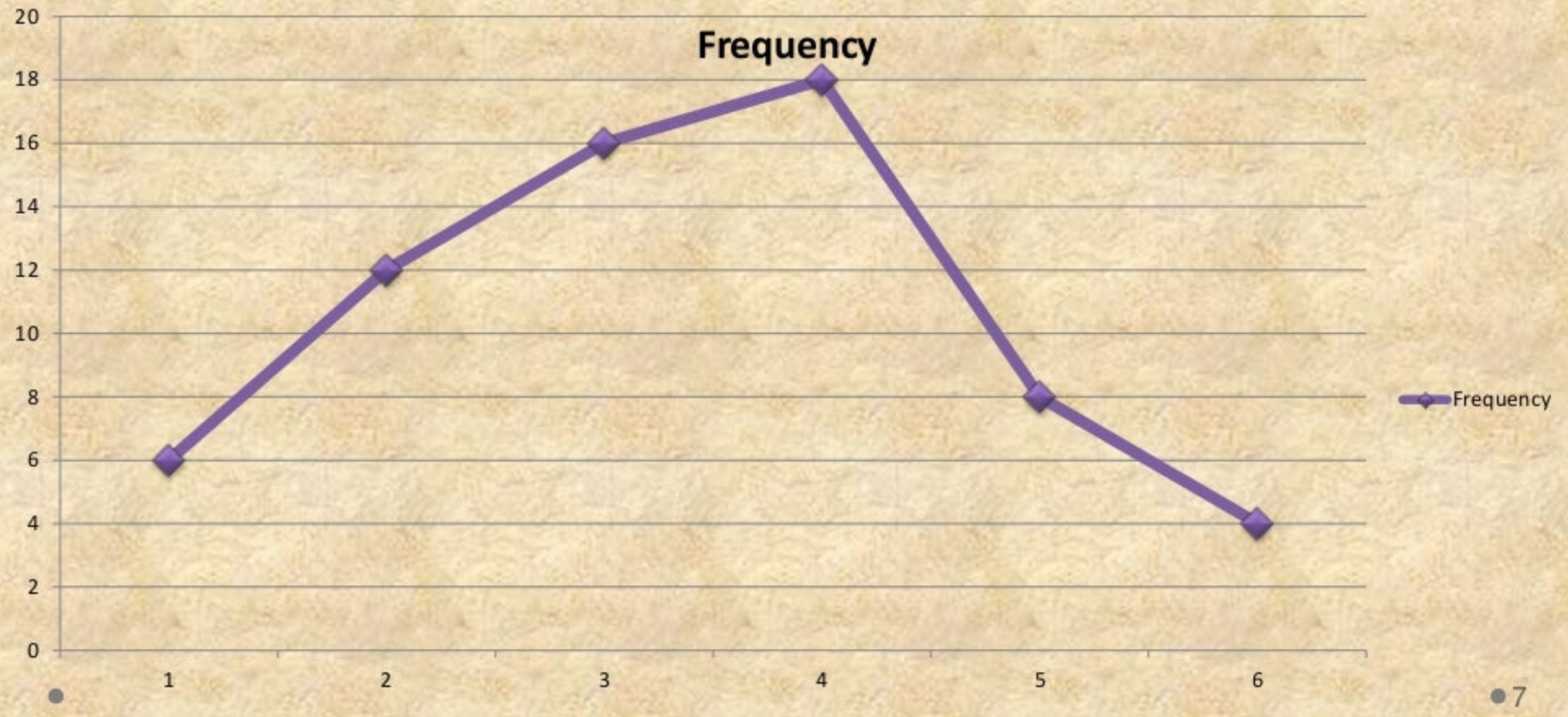
The line graphs are usually drawn to represent the time series data related to the temperature, rainfall, population growth, birth rates and the death rates.

Construction of a Line Graph

1st step: Draw X and Y-axis. Mark the time series variables (years/months) on the X axis and the data quantity/value to be plotted on Y axis.

- 2nd step: Choose an appropriate scale to show data and label it on Y-axis. If the data involves a negative figure then the selected scale should also show it. **Example;**

Classes	**0-10**	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**
Frequency	6	12	16	18	8	4



2. Bar Diagram

It is also called a columnar diagram. The bar diagrams are drawn through columns of equal width. Following rules were observed while constructing a bar diagram:

(a) The width of all the bars or columns is similar.

(b) All the bars should are placed on equal intervals/distance.

(c) Bars are shaded with colours or patterns to make them distinct and attractive . Four types of bar diagrams are used to represent different data sets:

1. The simple bar diagram
2. Compound bar diagram
3. Multiple bar diagram
4. Poly bar diagram.

The simple bar diagram

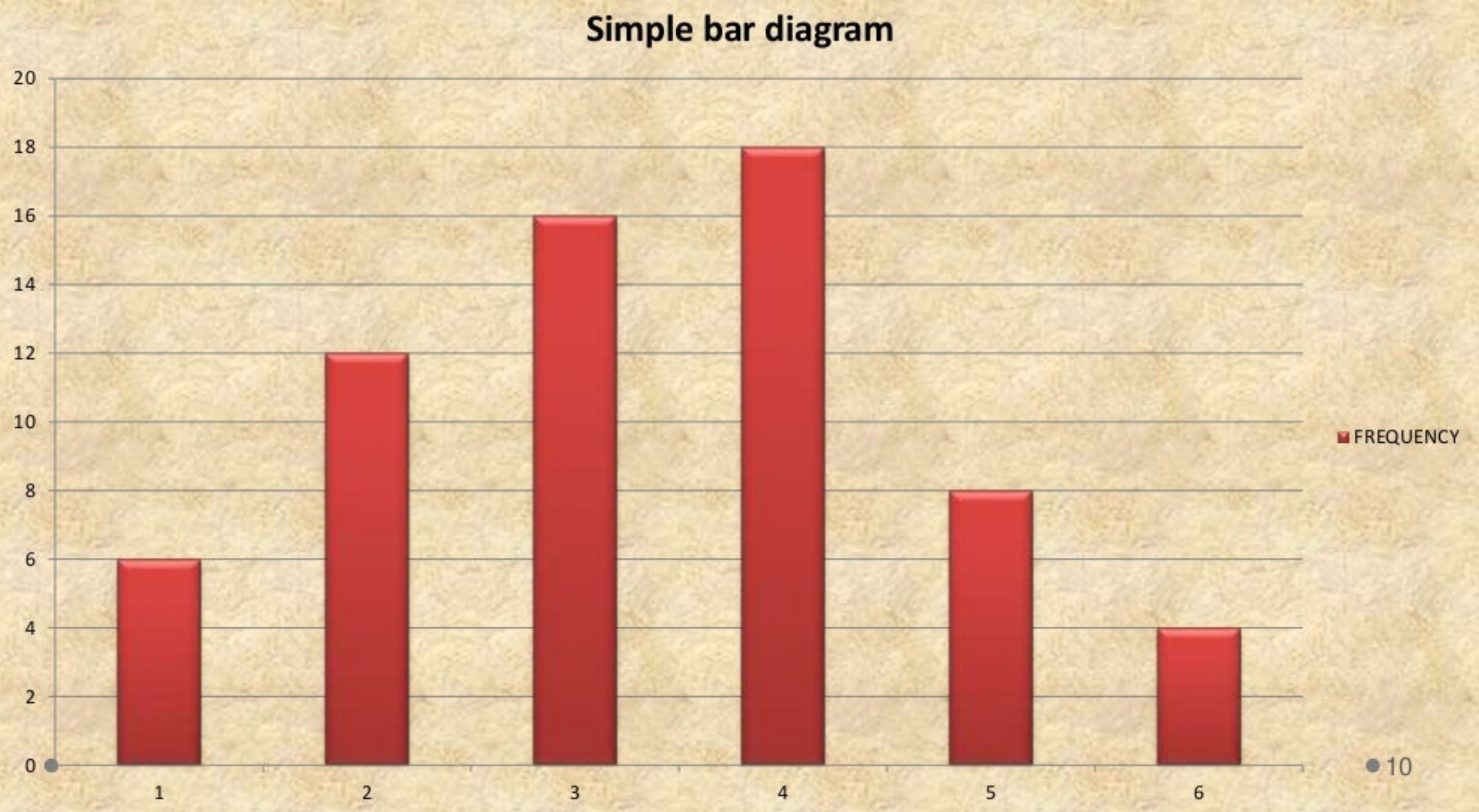
- A simple bar diagram is constructed for an immediate comparison. It is advisable to arrange the given data set in an ascending or descending order and plot the data variables accordingly. However, time series data are represented according to the sequencing of the time period.

Construction Steps:

- Draw X and Y-axes on a graph paper. Take an interval and mark it on Y-axis to plot data.
- Divide X-axis into equal parts to draw bars. The actual values will be plotted according to the selected scale.

Example ;

Classes	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	6	12	16	18	8	4



Multiple Bar Diagram

- Multiple bar diagrams are constructed to represent two or more than two variables for the purpose of comparison. For example, a multiple bar diagram may be constructed to show proportion of males and females in the total.

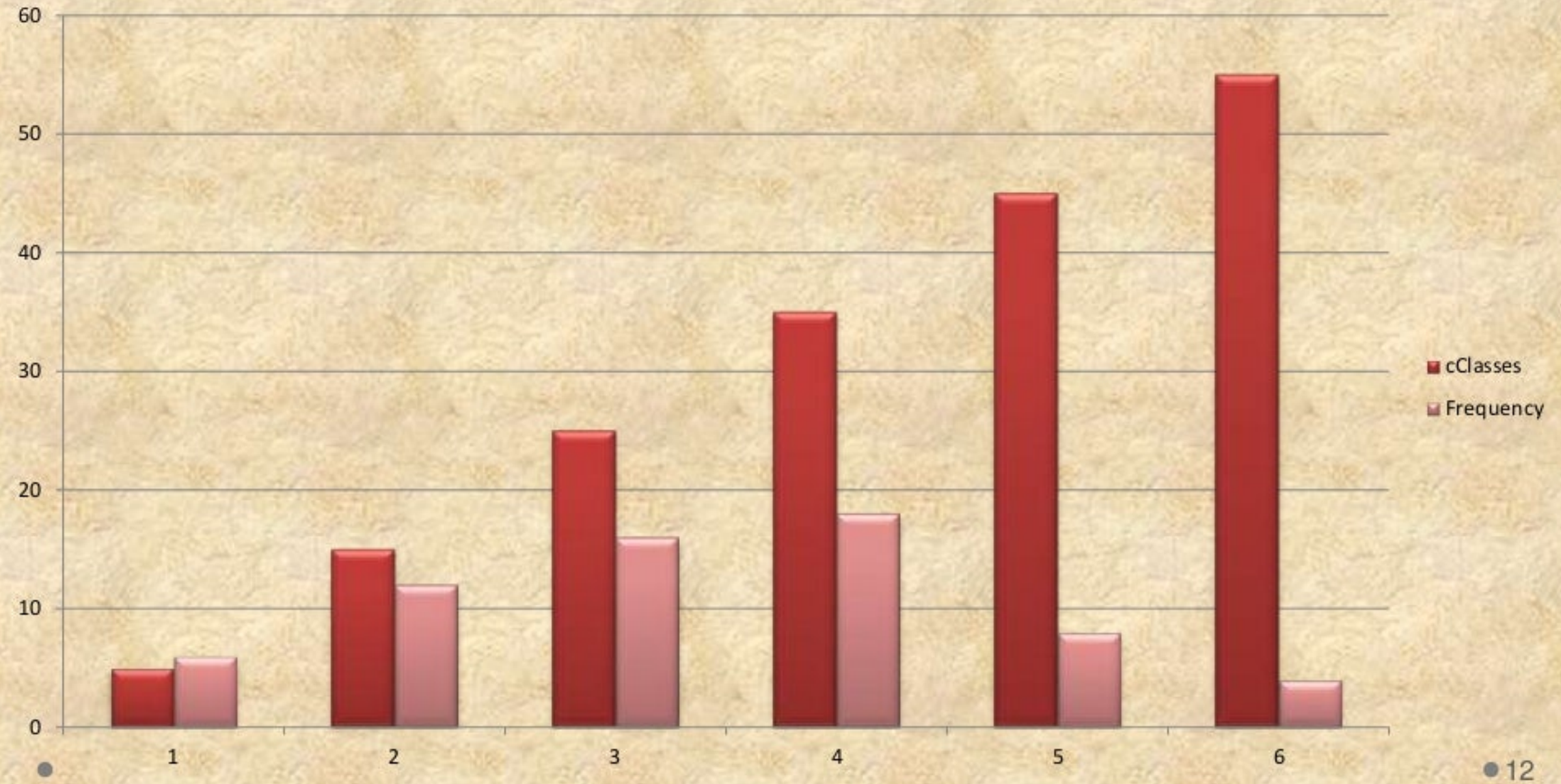
- **Construction**

(a) Mark time series data on X-axis and variable data on Y-axis as per the selected scale.

(b) Plot the data in closed columns.

Example ;

cClasses	5	15	25	35	45	55
Frequency	6	12	16	18	8	4



3. Pie Diagram

- Pie diagram is another graphical method of the representation of data. It is drawn to depict the total value of the given attribute using a circle. Dividing the circle into corresponding degrees of angle then represent the sub– sets of the data. Hence, it is also called as Divided Circle Diagram. The angle of each variable is calculated using the following formulae.

$$\frac{\text{Value of given state/ Region X 360}}{\text{Total Value of all States / Regions}}$$

If data is given in percentage form, the angles are calculated using the given formulae.

$$\frac{\text{Percentage of x X 360}}{100}$$

Calculation of Angles

(a) Arrange the data on percentages in an ascending order.

(b) Calculate the degrees of angles for showing the given values

(b) It could be done by multiplying percentage with a constant of 3.6 as derived by dividing the total number of degrees in a circle by 100, i. e. 360/100.

- **Example;**

Classes	5	15	25	35	45	55
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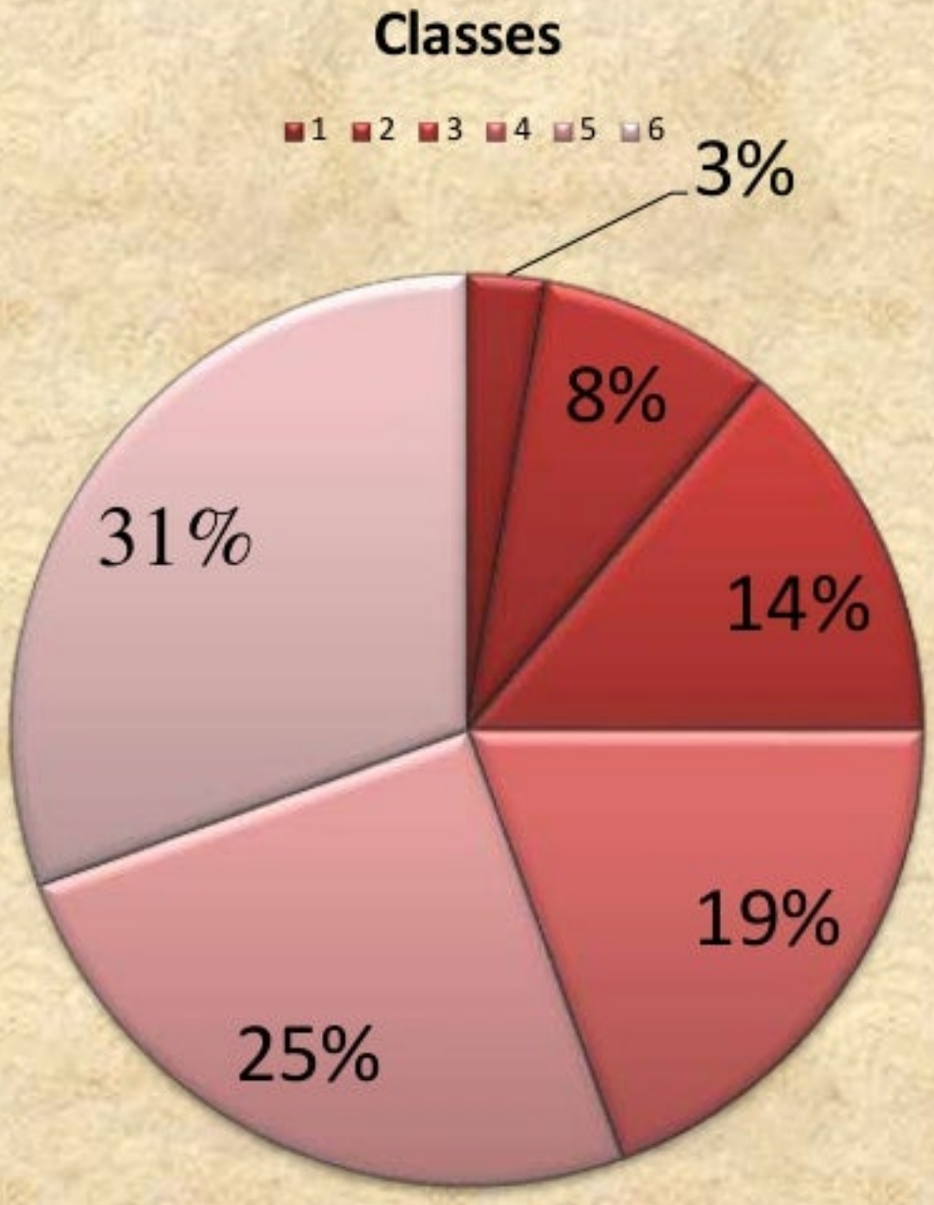


Compound Bar Diagram

When different components are grouped in one set of variable or different variables of one component are put together, their representation is made by a compound bar diagram. In this method, different variables are shown in a single bar with different rectangles.

Construction

(a) Arrange the data in ascending or descending order.

(b) A single bar will depict the set of variables by dividing the total length of the bar as percentage.

Example:

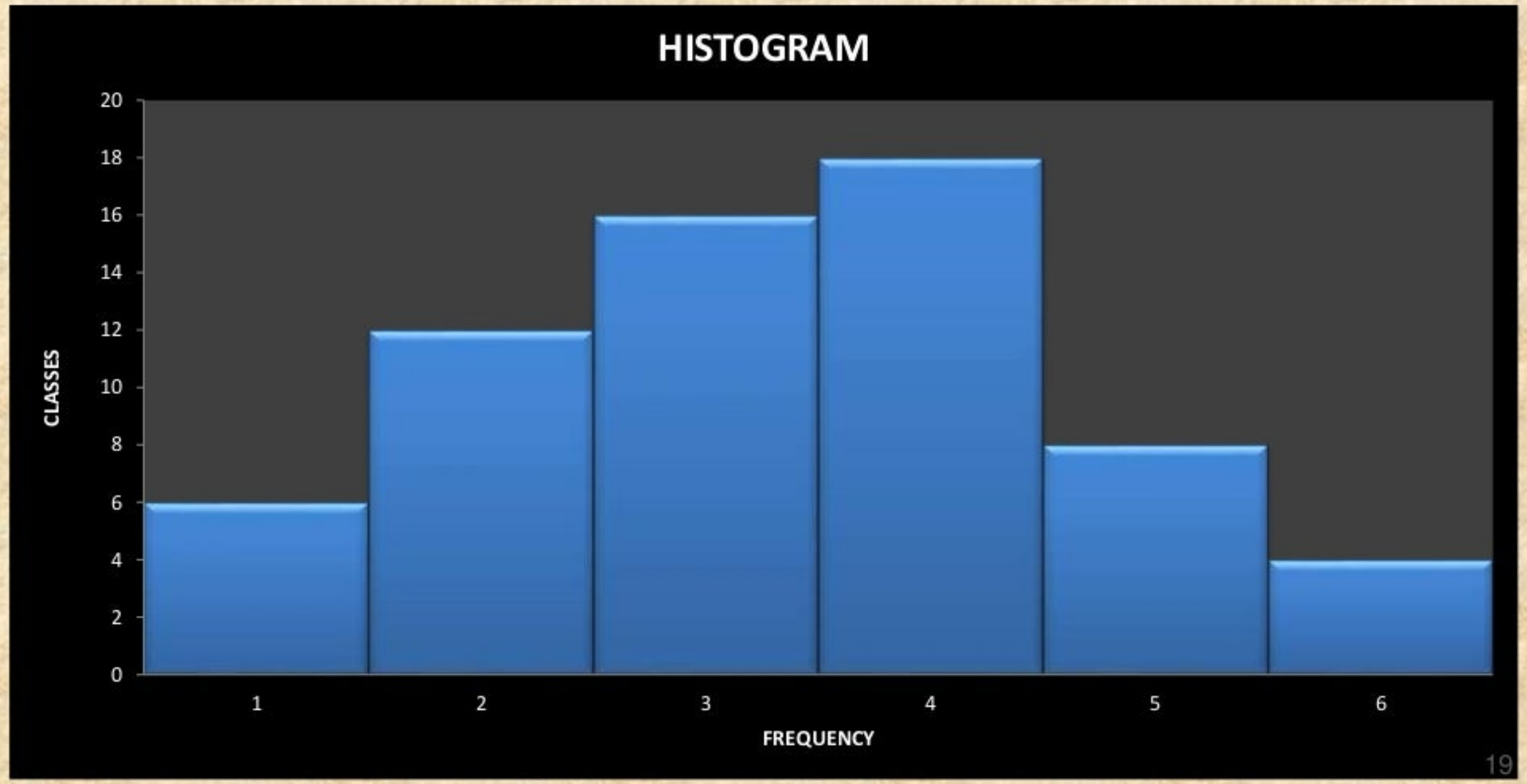
FOOD	1800	2200
CLOTHING	600	1000
HOUSE RENT	1000	2000
FUEL AND ELECTRICSITY	400	500
MISCELLANEOUS	200	300
TOTAL	4000	6000

Histogram

- A **histogram** is used for continuous data, where the bins represent ranges of data, and the areas of the rectangles are meaningful, while a bar chart is a plot of categorial variables and the discontinuity should be indicated by having gaps between the rectangles, from which only the length is meaningful.

Example :

Classes	10	20	30	40	50	60
Frequency	6	12	16	18	8	4



The need of graphically representing data :

- Graphics, such as maps, graphs and diagrams, are used to represent large volume of data.
- If the information is presented in tabular form or in a descriptive record, it becomes difficult to draw results.
- Graphical form makes it possible to easily draw visual impressions of data.
- It is a time consuming task to draw inferences about whatever is being presented in non–graphical form.
- These makes it easy to understand the patterns of population growth, distribution and the density, sex ratio, age–sex composition, occupational structure, etc.

References

1. Kumar Arun pharmaceutical biostatics published by Krishna prakashan media Ltd. Second edition 2011 Page no. 49-65.

2. http://s3.amazonaws.com/pdf download/graphicalrepresentationofdata-151013151149-lva1 accessed on 24 Feb, 2016 at 1:17 am.