

# Graphical Representation of Data.

The representation of quantitative data through graphs is known as graphical representation.

It is the mathematical picture of data. It helps us to think about a statistical problem in visual terms. It is the geometrical image of a set of data.

**Graph :-** A graph is a visual form of presentation of data where comparisons can be made b/w 2 or more values phenomenon etc.



## Advantages of Graphical Representation

1. Easy to understand.
2. Shows relationship b/w 2 or more sets of fig.
3. Has universal applicability.
4. Various imp statistical Parameters like mean, median mode etc can be easily observed.
5. It is used for interpolation & extrapolation.
6. Helpful for comparative analysis.
7. Helps in the study of frequency distribution.
8. The data can be presented in a more attractive & impressive manner.
9. Saves time & energy.
10. An effective & economic method for the presentation, understanding & interpretation of collected data.

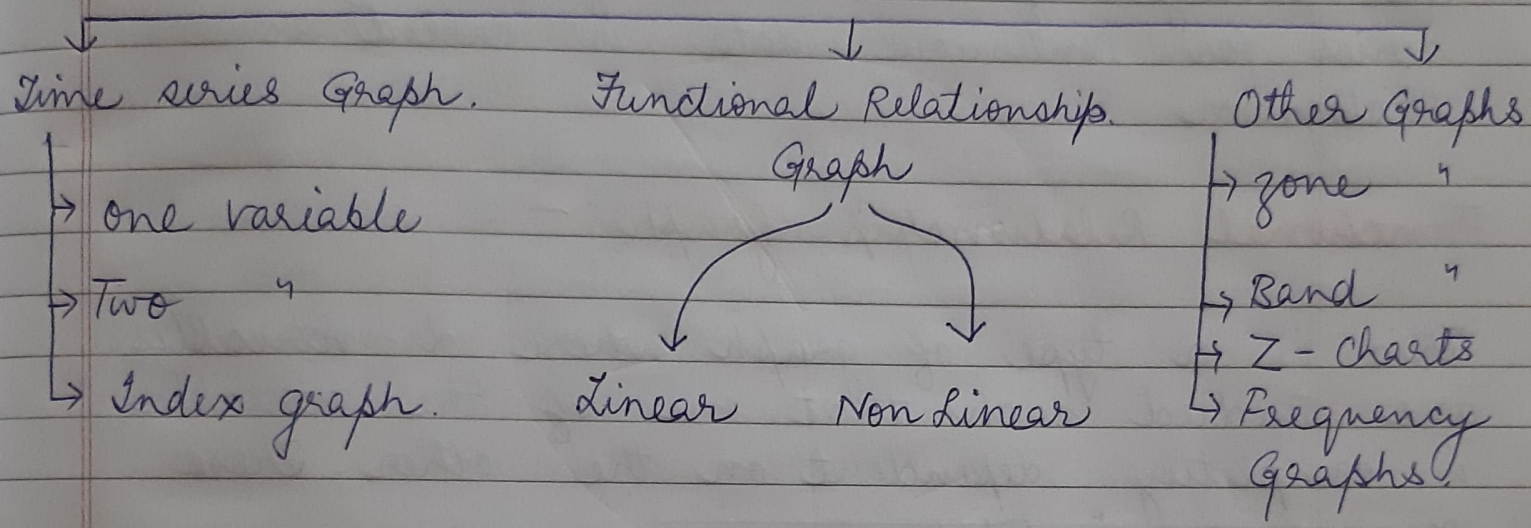
## Disadvantages :-

1. A graph does not show all the facts of data in detail.
2. It does not represent the exact values. But it shows only the approximate values.
3. It is more complex to represent & demonstrate more than 2 facts in a graph.
4. Complete accuracy is not possible in case of graphs.
5. Graphs cannot be quoted in support of some statement.
6. A graph simply shows tendencies & fluctuations & not the actual values.

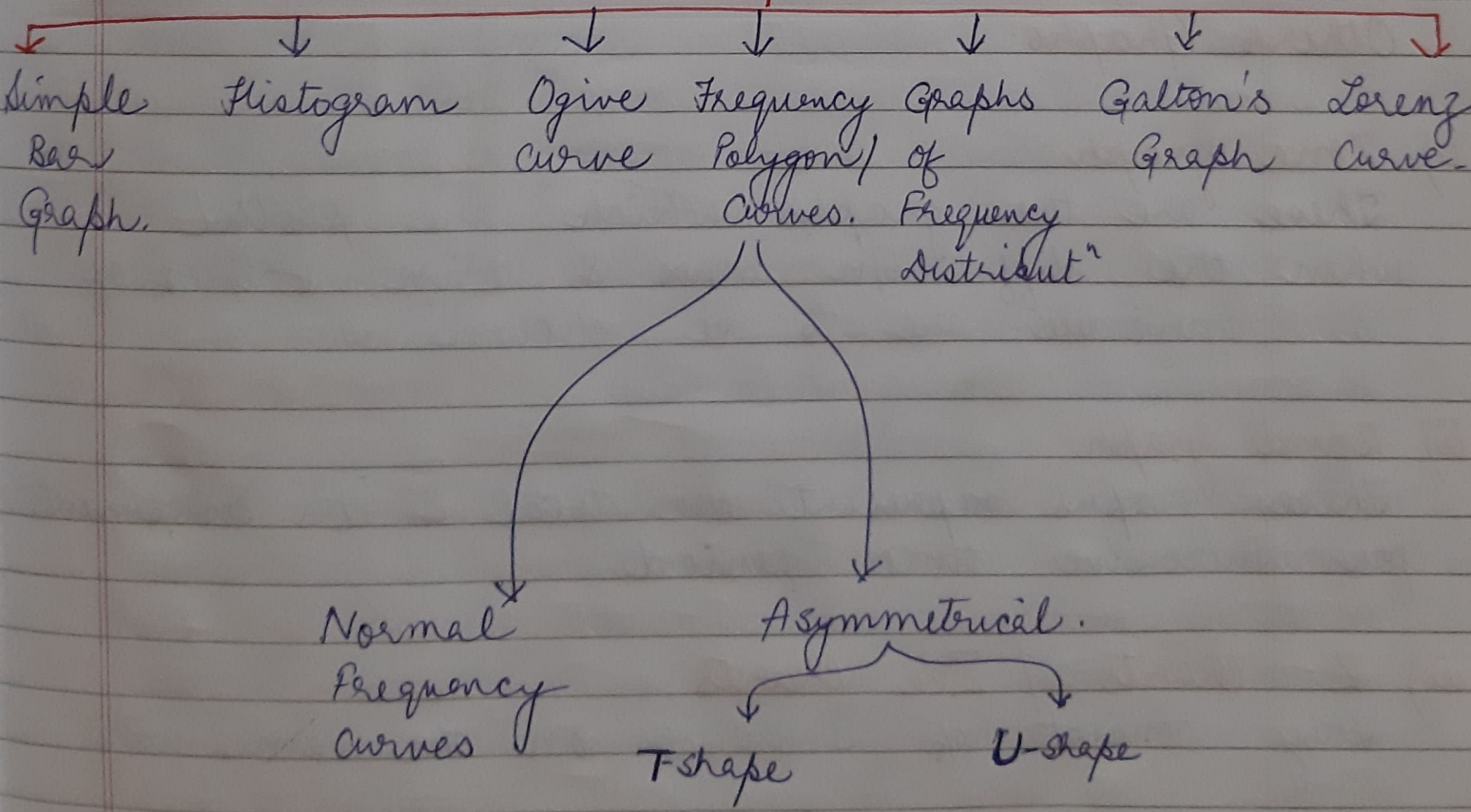


7. only a few characteristics can be depicted on a graph

### Types of Graphs :-



### Frequency Graphs.





## Time Series Graph:-

It shows changes in the value of variable over the passage of time. The graph of time series for continuous data is called as Histogram

## Functional Relationship Graph:-

This is a type of graph where 2 variables are studied such that one of the variable is completely dependent on the other. These can be of 2 types.

- 1.) Linear
- 2.) Non Linear.

## Others Graphs.

### i) Zone graph.

These are the graphs which are plotted when the diff b/n max & min values of a variable are to be shown.

### ii) Band graph.

These graphs represent the total & it's components for successive time period.

### iii) Z-charts. / Zee charts.

They consist of 3 curves on the same axis.



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iv) Frequency graph :- The representation of frequency distribution on graph is called as frequency graph. It includes

- a) BAR GRAPH
- b) HISTOGRAM
- c) OGIVE CURVE.
- d) GRAPHS OF FREQ. DIST.
- e) GALTON'S GRAPH
- f) LORENZ CURVE.
- g) FREQ. POLYGON & CURVE

## GRAPHICAL REPRESENTATION :- (of Grouped data)

1. Histogram
2. Frequency Polygon.
3. " Curve.
4. Cumulative frequency curve / Ogive curve.
5. Relative " map.
6. Scatter or dot diagram.

1. Histogram :- It is a graph containing a set of rectangles each being constructed to represent the size of class interval by its width on x-axis & the freq. in each class interval by its length on the y-axis. The total area of the histogram is directly proportional to the frequency.



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Applications :-

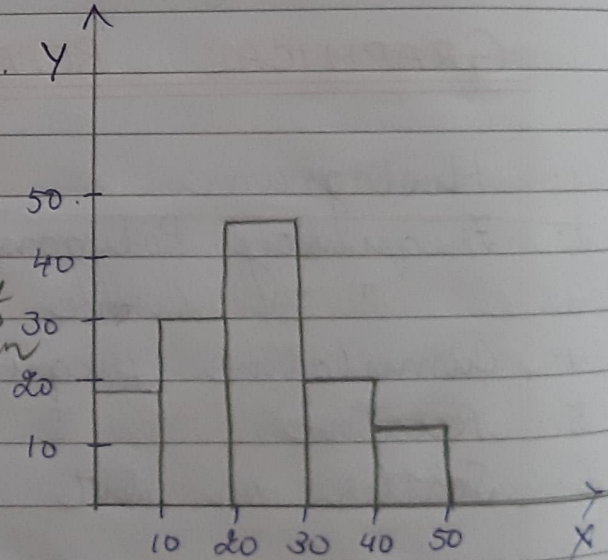
- i) used to depict a freq. dist. in  $\bar{w}$  quantitative data are continuous in nature.
- ii) It is an area diagram composed of series of adjacent rectangles. Hence the area used to represent the frequency in groups or class intervals when added together will give the composite area for the entire grp.

There are 2 types of Histogram.

- i) Histogram with equal class interval
- ii) " " " unequal " "

i) Histogram with equal class interval.

weight (in kg)	No. of children
0-10	18
10-20	30
20-30	45
30-40	20
40-50	12

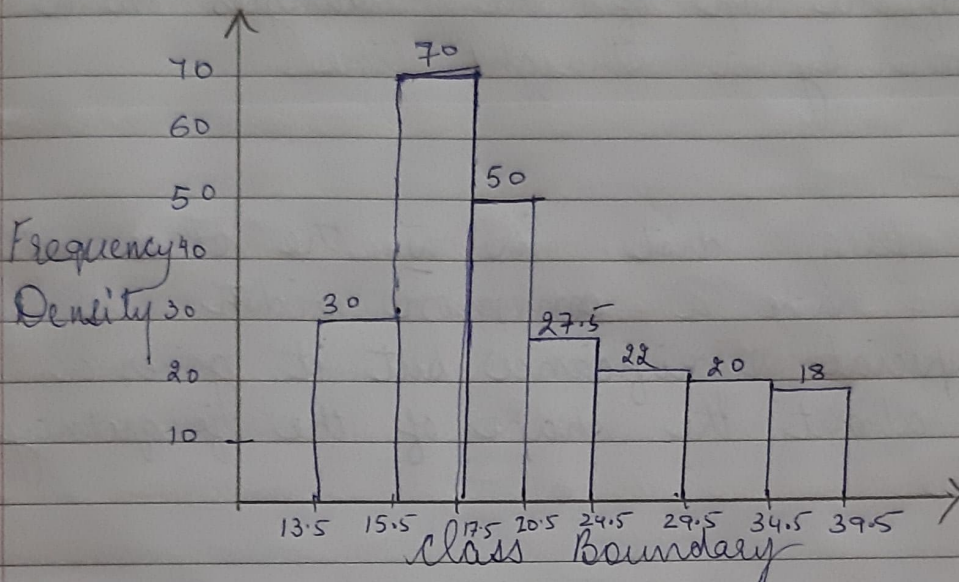
ii) Histogram with unequal class interval.

Age grp.	No. of Person (A)	Class Boundary	Class width (B)	Frequency density (A/B)
14-15	60	13.5 - 15.5	2	30
16-17	140	15.5 - 17.5	2	70
18-20	150	17.5 - 20.5	3	50
21-24	110	20.5 - 24.5	4	27.5
25-29	110	24.5 - 29.5	5	22
30-34	100	29.5 - 34.5	5	20
35-39	90	34.5 - 39.5	5	18



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Now graph plotted b/w Class Boundary & Frequency Density.



when the class intervals are unequal, difficulties arise because rectangles so formed will be of unequal width & sometimes with gap b/w them. In order to remove these difficulties the height of the rectangle are made proportional not to "freq." but to the freq. density.

In the example, class intervals are not of equal width so the histogram is drawn on the basis of freq. density, & the class limits of the classes are extended to their class boundaries because to draw a histogram upper limit of 1 class interval should coincide with the lower limit of next class interval.



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2. **Frequency Polygon**:- It is a polygon obtained by joining the middle point of the top of the rectangles in a histogram by a straight line.

Applications :-

- i) used in freq. dist. in  $\bar{w}$  the class intervals are equal & have a common width.
- ii) has no special significance but it gives a fair idea about the shape of the frequency distribution.

3. **Frequency Curve**:- It is drawn by free hands through various pts of frequency polygon in such a way that the area included is just the same as that of polygon.

The basic aim of drawing a freq. curve is to represent graphically the area covered by a histogram in a more symmetrical manner.

Frequency curve is also called as smooth

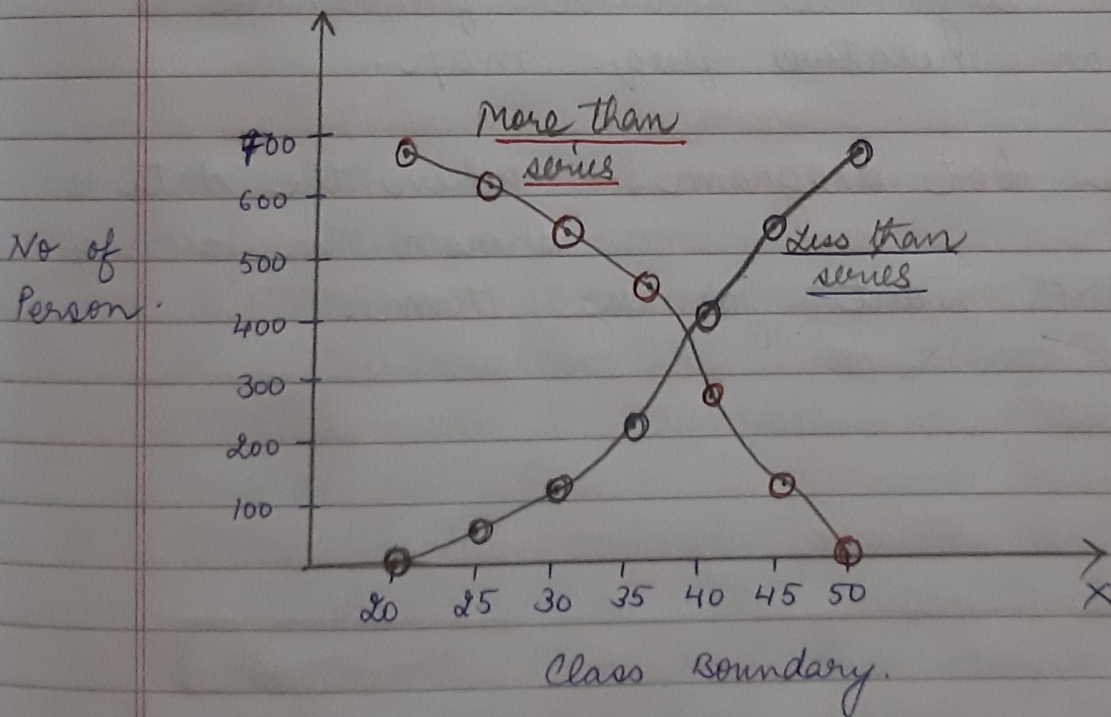
4. **Cumulative frequency curve / Ogive Curve.**

It is a graph  $\bar{w}$  represents the data of a cumulative freq. dist. when it is drawn in the form of a curve it is known as Ogive curve.

The " drawn from the data cumulated downwards is known as less than Ogive & the



Age.	No of Person	Class Boundary	Less than series	More than series.
20-25	50	20	Less than 20 = 0	More than 20 = 670
25-30	70	25	" " 25 = 50	" " 25 = 620
30-35	100	30	" " 30 = 120	" " 30 = 520
<del>45-50</del> 35-40	180	35	" " 35 = 220	" " 35 = 450
<del>55-60</del> 40-45	150	40	" " 40 = 400	" " 40 = <del>270</del> 300
45-50	120	45	" " 45 = 550	" " 45 = 120
		50	" " 50 = 670	" " 50 = 0



curve drawn from the data cumulated upwards is known as more than ogive.

- Applications:-
- i) An ogive is used to find medians, quartiles, deciles, percentiles etc.
  - ii) Also used to find the no. of observations which are expected to lie b/w 2 values.



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- Construction :-
- i) The upper limit of class represented along  $x$  axis
  - ii) Cumulative freq of class taken on  $y$  axis
  - iii) The pts are joined by free hand.
  - iv) ' curves formed are known as cumulative freq or ogive curve.
  - v) The less than " is always rising because cumulative freq rises as we move from 1 class to another.

5.) **Relative frequency Map :-** The graph which is plotted using the relative frequencies is called as relative freq. map.

6.) **Scatter or dot diagram :-** when the data is shown in form of simple dots without joining them.