MARUDHAR KESARI JAIN COLLEGE FOR WOMEN, VANIYAMBADI

PG & RESEARCH DEPARTMENT OF MATHEMATICS

CLASS   :   I BCA

SUBJECT CODE :   STATISTICAL METHODS AND IT APPLICATIONS I

SUBJECT NAME :   23UECA12A

SYLLABUS

UNIT- I

Introduction - scope and limitations of statistical methods - classification of data -Tabulation of data- Diagrammatic and Graphical representation of data - Graphical determination of Quartiles ,Deciles and Percentiles.

STATISTICAL METHODS & ITS APPLICATION-I

UNIT-01

Introduction - Scope and limitations of Statistical method - classification of statistical method - classification of data - tabulation of data - the diagrammatic and graphical representation of data - graphical determination of quartiles, Deciles and percentiles

UNIT-02

Measures of location:

Arithmetic mean, median, mode, geometric mean and Harmonic mean and properties

UNIT-03

Measures of dispersion:

Range, Quartile deviation, mean deviation - Standard Deviation, compiled standard deviation and the relative measures.

UNIT-04

Measure the Skewness:

Karl pearson's, Bowley's and kelly's and coefficient of Skewness and Kurtosis based on moments.

Correlation:

Karl pearson's - spearman's Rank correlation concurrent deviation methods - Regression Analy simple Regression equation.

Text Book Name:

Fundamental of mathematics statistics.

Book Author:

S.C Gupta and

V.K Kapoor

Reference book:

Statistical method
→ Dr. S P Gupta

Elements of statistical
→ E B Mode

STATISTICS

Statistics is "the Science of collection" organisation, presentation, analysis, and Interpretation of numerical data.

characteristics of statistics

* Aggregate of fatsi data
* Numerically expressed
* Affected by different factors
* Collected or Estimated
* Reasonable standard of accuracy
* Pre determined purpose
* Comparable
* Systematic collection.

DATA

Data refers to any groups of measurements that happen to increase Interest to us. This measurement provide information the decision makers users. Data are the foundation of any Statistical investigation and the job of collecting data in the same for a statistician as collecting stone, cement, Bricks etc..... risk for a builder.

Scope of STATISTICS

The scope of statistics is large intensive. It can be divided into two parts.

Statistical methods

Such as collection, classification, tabulation, presentation, Analysis, interpretation and forecasting.

Applied Statistics

It is further divided into three parts namely;

Descriptive applied statistics

Purpose at this analysis is to provide descriptive information.

Scientific Applied Statistics

Data are collected with the purpose of some scientific research and with the help of these data some particular theory or principle is prefounded.

Business Applied Statistics

Under this branch Statistical method are used for the study, analysis and solution of various problems in the field of business

Statistics in State

Statistics is essential for country, it supplies essential information to run the government. Statistics was regarded as the "Science of kings". Different policies of government are based on statistics. The State may accept or reject the policy on the basis of statistics. Periodic collection of data relating to population, national wealth, agriculture use, exports, imports, Education etc.

Statistics in Economics

Statistics is an indispensible tool in the aspects of economics study. The problems in Economics cannot be studied without the use of the statistics. All Economic law are based on the study of collected statistical data. There is no field of Economics without applying the statistics.

Statistics in Business

Statistics helps in business to test and make correct decision about the location of the business marketing the product financial resources etc... based on the statistical Information.

Statistics in Education

Statistics is necessary for the information of policies to albut new courses according to the changing environment.

There are many Educational Institute Owned by public and private. Engaged in research and development works to test the past knowledge and evolved new knowledge.

Statistics in astronomy:

Astronomy is one of the most Oldest branch of Statistical Studies. It deals with the measurement of distance, size, masses and density of heavily bodies by means of observation during this measurement Error are unavoidable most probably measures are found of using Statistics methods.

Statistics in Research

Method and data are indispensible in research work in the field of medicine and health program Statistical method are used to know the Effectiveness of new discovered medicine and method of treatments.

"

functions of Statistics

→ It Simplifies the complexity

→ It presents fact in a definite form

→ It facilitate comparisons

→ It helps formulating and testing hypothesis

→ It test the law of other signies

→ It was very chelpfull in forecasting in future trends

→ It was very helpful in the basis of the analysis of the past data as modified in the light of current condition.

→ It Enlarges individual Experiences

→ It helps the Government

→ It studies relation (price and production)

LIMITATIONS OF STATISTICS

* Statistics does not deals with Individual item.

* Statistics deals with quantative data only.

* Statistics may mislead to wrong conclusion in the absence of data.

* Statistical Laws are true only on averages.

* Statistics does not reveal the entire story

* Statistical data should be uniform and homogeneous

* Statistics is liable to be misused.

COLLECTIONS

CLASSIFICATION OF DATA

MEANING OF CLASSIFICATION:

classification is the process of arranging data into sequences and groups According to their common characteristics Seperating them into different but related parts

CHARACTERISTICS OF CLASSIFICATION:

- All the facts are classified into homogenous groups by the process of classification.

- The basis of classification is unity in Diversity

- Classification may be either real or imaginary.

- The classification may be according either similarities or dissimilarities

- It should be flexible to accomodate adjustments.

OBJECTS OF CLASSIFICATION

* To conclude the mass of data to present the facts in a simple form.

* To bring out the clearly the points of similarities and Dissimilarities

* To facilitate Comparison To bring out the relationship

* To prepare data for tabulation

* To facilitate the statistical treatment of the data

* To facilitate Easy Interpretation

* To determinate unnecessary details

RULES OF CLASSIFICATION:

EXACTNESS:

The classes should be regidly define they should not lead to any ambidigouity or confusion.

MUTUALLY EXCLUSIVE

Each item of data must fined its place in one class The classes must not overlap

STABILITY

Only one principle must be maintain through out the analysis.

Then only it will facilitate meaningful comparison and become an Idential / Ideal classification

FLEXIBILITY

The classification should be flexible and easy to adjust to new situation and circumference.

SUITABILITY

The classification should be Suitable for the object of the enquiry

HOMOGENITY

The Items included in Each class must be Homogenous

ACCURACY

Mathematical accuracy is Very Important in the classification of data.

TYPES OF CLASSIFICATION:

* There are four types of classification

* Geographically or area wise or region wise or district wise.

* chronological or Historical, Such that on the basis of time

* Qualitative by character or by attributes

* Quantitative or numerical or by magnitude.

GEOGRAPHICAL CLASSIFICATION.

* In geographical classification we classify the data according to location difference between Various item

* In the statistical data like State, district, cities, Taluk, Region, Zone, Area et

* Geographical classification is illustrated in the following table.

SALES Data of pressure cookers for 2016 (Tamil nadu)

Name of Town	Number of Cookers
chennai	15,000
Trichy	13,000
Madurai	11,000
Coimbatore	10,000

CHRONOLOGICAL CLASSIFICATION :-

* This type of classification statistics data classified data according to the time of accurance such as year, months, weeks, Hours, Days etc.....

* Statistical data regarding population imports, exports, Sales etc. Also come under this classification.

population of India (years) from [2001 - 2005]	Population in (crores)
	1,024
2001	
2002	1035
2003	2,046
2004	2064
2005	2125

QUALITATIVE CLASSIFICATION

* When the data are classified according to some quality (attributes) Such as Honesty, Intelligence, Literacy, Colour, region, marital status etc.

* In this type we can find out the presence or absence of the attributes in the given units this again can be classified into
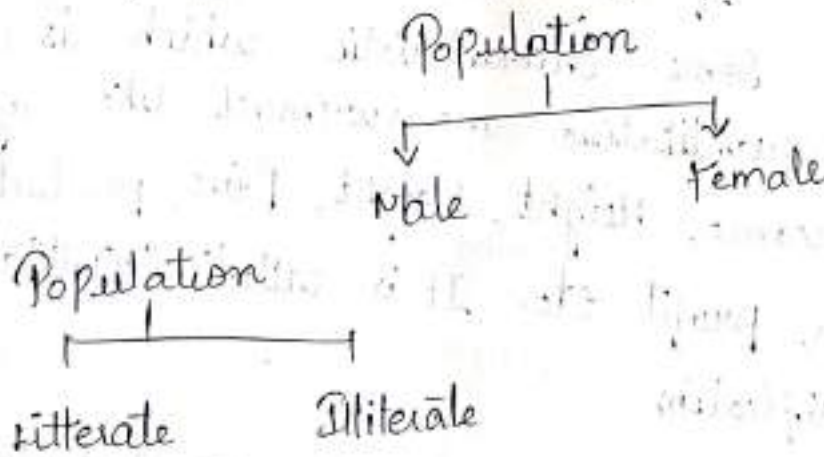
Two types.

they are;

* Simple classification.
* Manifoled classification

SIMPLE CLASSIFICATION:

If the data are classified into two classes such as Literate or Illiterate, Honest or Dishonest, Skilled or unskilled the classification is termed as Simple classification.

For Example;

Population
|
├──────────┴──────────┤
↓   ↓
Male   Female

Population
├──────────┬──────────┤

Litterate   Illiterate

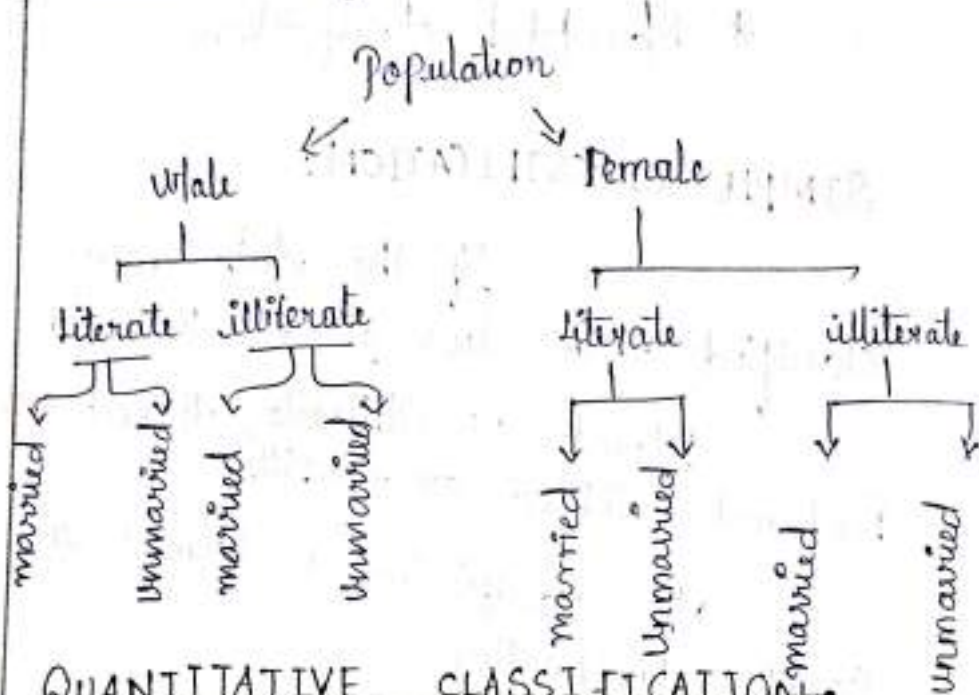## MANIFOLED CLASSIFICATION

In Manifoled classification the universe classified on the basis of more than one attribute at a time.

Example:

We may first divide the population into males and females on the attributes of sex, then further divided them on basis literacy and so on.

Population

Male ← Population → Female

Male:
- Literate
  - married
  - Unmarried
- illiterate
  - married
  - Unmarried

Female:
- Literate
  - married
  - Unmarried
- illiterate
  - married
  - unmarried

QUANTITATIVE CLASSIFICATION

If the data are classified according to some characteristic which is capable of quantitative measurement like age, Income, Height, Weight, Price, production, Sales, profit etc. It is called Quantitative classification

Marks	Number of Students
10-20	10
20-30	7
30-40	13
40-50	18
50-60	12

FREQUENSIVE DISTRIBUTION

In statistics a frequency distribution is a list, table or graph. that displays the frequency of various outcomes in a sample. Each entry in the table contains the frequency or count of the accurance of values. Within a Particular group of interval Basically frequency distribution can be 0-1, Un-Variate frequency distribution. 0-2 bi- Variate frequency distribution.

Again Uni-Variate frequency distribution are of

* Individual frequency distribution
* District frequency distribution
* Continues frequency distribution

INDIVIDUAL FREQUENCY DISTRIBUTION

A frequency distribution is an Organised tabulation Showing exactly how many Individuals are located in each Categories on the Scale measurement.

A frequency Distribution Presence an Organized Picture of the online sole of Scores and it also shows where each Individual is located related to others in the distribution

Eg:

Roll no	1	2	3	4	5	6	7	8	9	10
Marks	40	55	32	38	41	48	44	51	37	50

(b) DISCRETE FREQUENCY DISTRIBUTION:

In discrete frequency distribution values of the variable is arranged individually the frequencies of the various values are; the numbers of the times each value occurs. It is a type of frequency of each distribution that display the frequency of each distribution individual data values instead of group of data values.

No. of value childrens	No. of families
0	12
1	14
2	110
3	65
4	29
Total	300

MAKING FREQUENCY TABLE :

Data may be given in the form of Individual Observation they are to be Converted into discrete frequency distribution.

* Variable

* Tally marks

* Frequency

$$|||$$

$$||||$$

Example: 0.1

Consider the marks by 30 students

9	7	5	3	4	8	6	0	6	5
9	1	7	2	3	8	6	8	7	4
4	4	5	10	6	5	9	6	9	5

Marks	Tally marks	Frequency
0	I	1
1	I	1
2	I	1
3	II	2
4	IIII	4
5	IIII	5
6	IIII.	5
7	III	3
8	III	3
9	IIII	5
10	I	1

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Example : 02

The following gives number of children in 50 families Construct a suitable frequency table ?

4	2	0	2	3	2	2	1	0	2
3	5	1		4	2	1	3	4	2
6	1	2	2	2	1	3	4	1	0
2	4	3	0	1	3	6	1	0	1
1	3	4	1	0	1	2	2	2	5

Number of children	Tally marks	Frequency
0	卌 Ⅰ	6
1	卌 卌 Ⅲ	13
2	卌 卌 Ⅲ	13
3	卌 Ⅱ	7
4	卌 Ⅰ	6
5	Ⅱ	2
6	Ⅱ	2
Total		50 /-

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Continues frequency distribution

of Continuous frequency distribution is a series in which the data are classified into different class intervals without gaps and their respective frequencies are assigned as per the class Intervals and class width.

Discrete can also be called as groups.

```
        I           D                C

                un grouped        grouped.
```

__I. F. D__
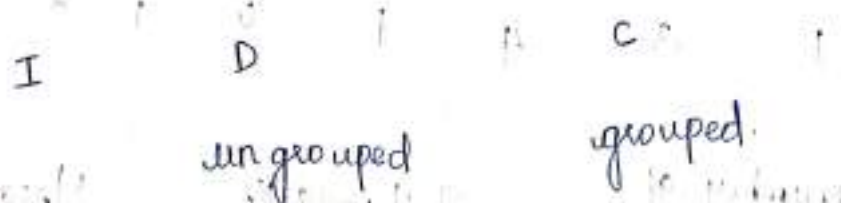
: Series of individual reservation series where items are listed singlely after observation   ''   ''''   '''.

D   ''   '''   '''.

we have the count the number of times each value of the variable is repeated in the data, called the frequency.

D. variable is one where the variant differ from each other by definite amount

Continuous Series

A collections of items which cannot be exactly measured but plays with in contain limit is called continous Series.

Class limit

The class limits are the smallest are the lowest and the largest are the highest values in the class.

Example:

Take the class 10-20

lowest limit = 10

Upper limit = 20

class limit is known as the class boundaries.

Class Interval

The difference between the upper limit and the lower limit of the class is known as the class Interval

formula :

$$i = \frac{L - S}{K}$$

L - largest item

S - Smallest item

K - Number of classes

0-10   10-20   20-30   30-40   40-50   50

$$S = 0$$
$$L = 60$$
$$k = 6$$

$$i = \frac{L-S}{K}$$

$$= \frac{60-0}{6}$$

$$i = \frac{60}{6} = 10$$

Methods of class interval:

There are two methods of class interval

(1) Exclusive method

(2) Inclusive method

EXCLUSIVE METHOD OR OVERLAPPING

The upperlimit of one class interval is the lower limit of next class.

Example:

Mark	Number of student
0-10	2
10-20	5
20-30	8

INCLUSIVE METHOD OR NON OVERLAPPING

The upper limit of one class is included in that class.

Marks	Number of students
10-19	10
20-29	15
30-39	30
Total	55

Class frequency:

The number of observation fall in within a class-interval is called class frequency.

The central value of the class interval
is called class mid point.

$$\text{Mid-Point} = \frac{U.L + l.L}{2}$$

Marks scored by 30 students are given
below:

41, 55, 42, 47, 53, 48, 33⑥, 52⑤, 42, 55

44, 38⑩, 60, 65, 71, 80, 41, 53, 77, 48

55①, 20, 31④, 34⑦, 42, 51, 35⑨, 35②, 22③, 25⑧

(1) Arrange the marks in an ascending order

20, 25, 26, 31, 32, 33, 34, 35, 35,

38, 41, 41, 42, 44, 47, 47, 48, 48,

48, 51, 53, 53, 55, 55, 55, 60, 65, 71, 80

(2) Arrange the marks in Descending order;

80, 71, 65, 60, 55, 55, 55, 53, 53,

51, 48, 48, 48, 47, 47, 44, 42, 42,

41, 41, 38, 35, 35, 34, 33, 32, 31,

26, 25, 20.

the central value of the class [interval] is called class mid point.

$$\text{Mid-Point} = \frac{U\cdot L + L\cdot L}{2}$$

Marks scored by 30 students are given below:

41, 55, 48, 47, 53, 48, 33, 32, 42, 55

44, 38, 60, 65, 71, 80, 41, 53, 47, 48

55, 20, 31, 34, 42, 51, 35, 35, 26, 25

(1) Arrange the marks in an ascending order;

20, 25, 26, 31, 32, 33, 34, 35, 35,

38, 41, 41, 42, 44, 47, 47, 48, 48,

48, 51, 53, 53, 55, 55, 55, 60, 65, 71, 80

(2) Arrange the marks in Descending order;

80, 71, 65, 60, 55, 55, 55, 53, 53,

51, 48, 48, 48, 47, 47, 44, 42, 42,

41, 41, 38, 35, 35, 34, 33, 32, 31,

26, 25, 20.

3) convert the marks into continous series of a class interval

Marks	Frequency	Tallymarks
20-30	3	III
30-40	7	IIII II
40-50	10	IIII IIII
50-60	6	IIII I
60-70	2	II
70-80	2	II

Definition of magnitude of class interval

The magnitude of class interval is given by;

$$i = \frac{Range}{1 + 3.322} (\log N)$$

where

i = magnitude of class interval

log N = logarithm of the total number of observation.

Cumulative frequency distribution

Cumulative frequency distribution are derived by the cumulative of the cumulation of the frequencies of successive values.

Cumulative frequency of a given variable or class represents the total frequency of all previous variables including the variable or the class.

(1) make a frequency distribution with intervals of 10 from the following data.

(2) Also prepare less than cumulative frequency distribution

(3) Also prepare more than cumulative frequency distribution.

85	40	36	43	8	57	90	92	74	6
63	41	57	34	24	63	93	71	55	5
45	39	44	59	90	43	82	88	72	
80	53	64	79	95	85	68	65	69	8

Marks	frequency	Tallymark
30 - 40	3	III
40 - 50	6	IHI I
50 - 60	6	IHI I
60 - 70	7	IHI II
70 - 80	5	IHI
80 - 90	8	IHI III
90 - 100	5	IHI

Mark	C. f
less than 40	3
LT 50	9
LT 60	15
LT 70	22
LT 80	27
LT 90	35
LT 100	40

Mark	C. f
MT 90	5
MT 80	13
MT 70	18
MT 60	25
MT 50	31
M T 40	37

two way frequency distribution

(Bi-Variable):

A frequency table were two variable have been measured in the same set of items through cross classification is known as Bi-variable or two way frequency distribution.

Problems:

25 values of two variables x and y are given below. form a two way frequency table, showing the relationship between the two class intervals of x as 10, 20, 20, 30 .... etc and y as 100 - 200, 200 - 300 .... etc.

Formula:

$$i = \frac{Range}{1 + 3.322 \, \log N}$$

$$Range = 1 - S$$

S NO	X	Y
1	12	140
2	24	256
3	33	360
4	22	470
5	44	470
6	37	380
7	26	280
8	36	315
9	55	420
10	48	390
11	27	390
12	57	590
13	21	250
14	51	550
15	27	360
16	42	570
17	43	290

S.no	X	
18	52	416
19	57	380
20	44	492
21	48	440
22	48	370
23	52	312
24	41	330
25	69	590

using the formula:

$$i = \frac{Range}{1 + 3.322 \cdot \log N}$$

Range = L - S

Here; S = 12, L = 69

$$X = \frac{69 - 12}{1 + 3.322 (\log 25)}$$

$$X = \frac{57}{1 + 3.322 (1.3979)}$$

$$X = \frac{57}{5.6438}$$

K = 5.6438

$$X = 10$$

S = 140

L = 590

$$y = \frac{L - S}{K} = \frac{590 - 140}{5.6438} = \frac{450}{5.6438}$$

$$Y = 80$$

Tabulation of Data

1. meaning of tabulation

A systematic presentation of numerical data in columns and rows.

2. Definition:

A statistical table is a systematic organisation of data in columns and rows.

Tabulation is the process of presenting data in Table.

Parts of Tabulation:

X form

A good statistical table is one and the following parts must be present in all table.

1. Table number:

A table should always be number for identification and reference in the future.

2. Title of the table:

Each table should be given by a suitable title. It must be written on the top of the table.

It must explain

a) what data are

b) where the data are etc.

3 Head Note

It is a statement given below the title are enclosed in brackets.

4. Caption

These are heading for the verified columns, they must be brief and self explanatory

5. Stubs

These are the heading are designation for the horizontal row.

6. Body of Table

It contains the numerical information it is the most important part of the table.

The arrangement in the body is generally from left to right in rows from top to bottom in columns.

7. Foot Note

It refers to the source from were information has been taken. It is useful to the reader to check the figures and gathered additional information

Structure of a Table

Number title (Head note if any)

Stub Heading	Captions			Total
	Col Heading	Col Heading	Col Heading	

Foot note Source

Rules for Tabulation:

(1) The table should be simple and compact the captions and stubs in the table should be arranged in a systematic manner.

(2) There are many types of alphabetical, geographical, chronological etc......

(3) The unit of a measurement should be clearly defined and given in the table

example;

Height in metres, weight in kg

(4) Suitable approximation may be adopted.

(5) A Table should be complete and self explamatory

(6) observation should be avoided

(7) Don't use dithom uvics.

(8) That may be mistake.

31/8/23.

Types of table

* Statistical tables can be classified into a number of ways

(A) on the basis of courage classified into

(i) Simple table

In Simple table the data are classified according to only one characteristic it is termed one way (or) Single table.

class mark	No. of. student.
20-30	10
30-40	18
40-50	22
Total	50

(5) A Table should be explamatory

(6) observation should be avoided

(7) Don't use dithom avics.

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X: Statistical tables can be classified into a number of ways

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20-30	10
30-40	18
40-50	22
Total	50

(ii) Complex table

In complex table two or more characteristics are shown

(a) Two way table

If the caption or stubs is classified into two characteristic and if its given information two interrelated Questions.

Eg:

Distribution of marks (Boys & Girls)

class mark	No. of Students		
	Boys	Girls	Total
20-30	6	4	10
30-40	8	10	18
40-50	10	12	22
Total	24	26	50

b) Three way table

In this type of table, 3 characteristics are shown.

Age	Male			Female			Total	
	literate	Illiterate	T	literate	illiterate	T	Li	Ili
0-18								
18-25								
24-35								
35-45								

B) On the basis of objective (Purpose)

a) General purpose table;

It is also known as information table and provides information for general use government agencies Prepare this type of table. It is used by research works and Statisticians.

b) Specific Purpose table

It presents the data relating to a particular or Specific purpose ratios, percentage etc, are used to facilitates Comparisons.

I) On the basis of orgonality

In a derived data table figure and results are derived from the primary data. It presence the percentage, ratio, average, dispersion etc...,

DIAGRAMMATIC REPRESENTATION:

Diagram:

A Diagram is a visual form of Presentation of statistical data. Diagram refers to the various types of device such as bar, circle, maps, Pictorials, Cartograms;....

Uses of diagram /Advantage.

* They are attractive and impressive
* They save time and Labour
* They make data Simple
* They make comparison easy
* They provide more information
* They have universal applicability

Disadvantage / Limitations

Diagram Cannot be analysed further.

Diagram should always in approximate Value.

% to draw a table is easy but construction of diagram is not easy.

Diagram are drawn when comparison needed

Diagram drawn on false base

Minute readings cannot be made Small difference in Large measurement Cannot be defined.

Types of diagram

There are many types of diagramm in our statistical data.

1. One dimensional (Line and Bar)

2. Two dimensional (Rectangle, circle, square)

3. Three dimensional (cube, Sphere, cylinder).

4. Pictograms

5. Cardograms

One dimensional diagram

In one dimensional diagram the length of the line is considered and the width of the bar is not taken The height will represent the magnitude of observation. A diagram in which the size of length is field in proportion to the value of the data is called one dimensional diagram.

Represent the following data in a diagram

District		A	B	C
Population	male	1000	1200	1500
	female	500	800	2000
Total		1500	2000	2200
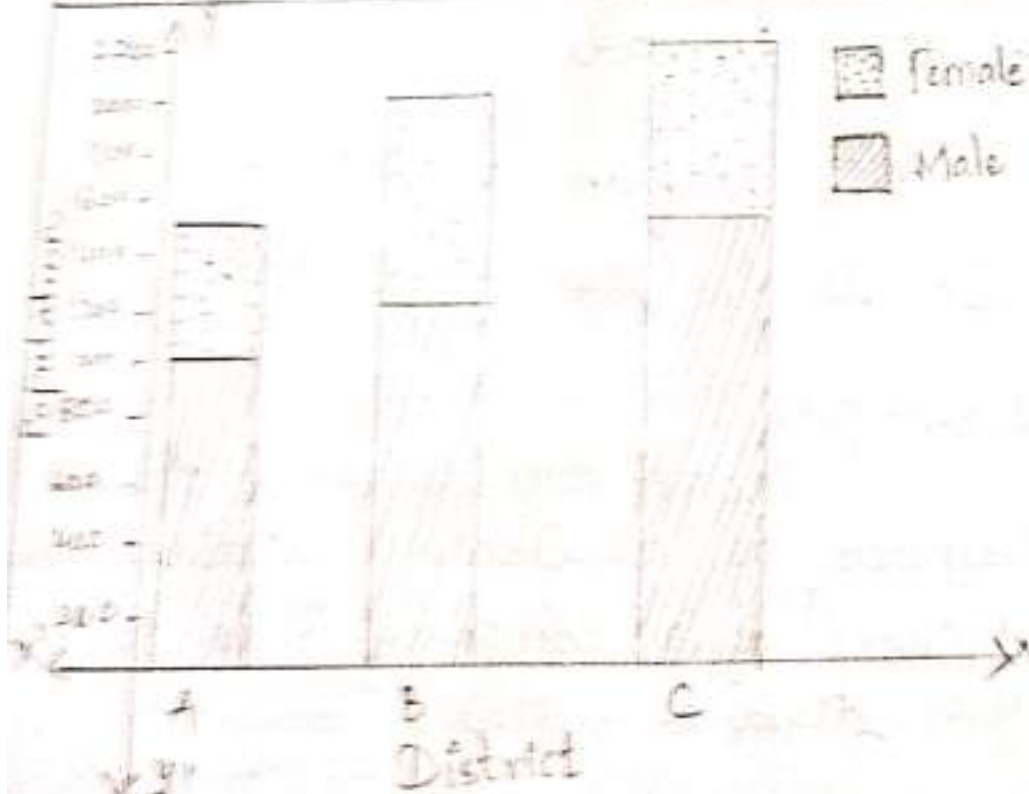
In one dimensional [...]
of the lines are bars It consider
and the width of the bar is not
taken.

Types

1. Line diagram
2. Simple bar
3. Multiple bar
4. Subdivided bar
5. Percentage Subdivided

Line Diagram

This is the simplest of all
the diagram, On the basis of all
the diagrams or figures, height
of the bars are drawn.

This diagram is not attractive
So, It is less important.

Example:

The following data shows the
number of accidents Sustained by 100
drivers of a company in a particular
year draw a suitable diagram.

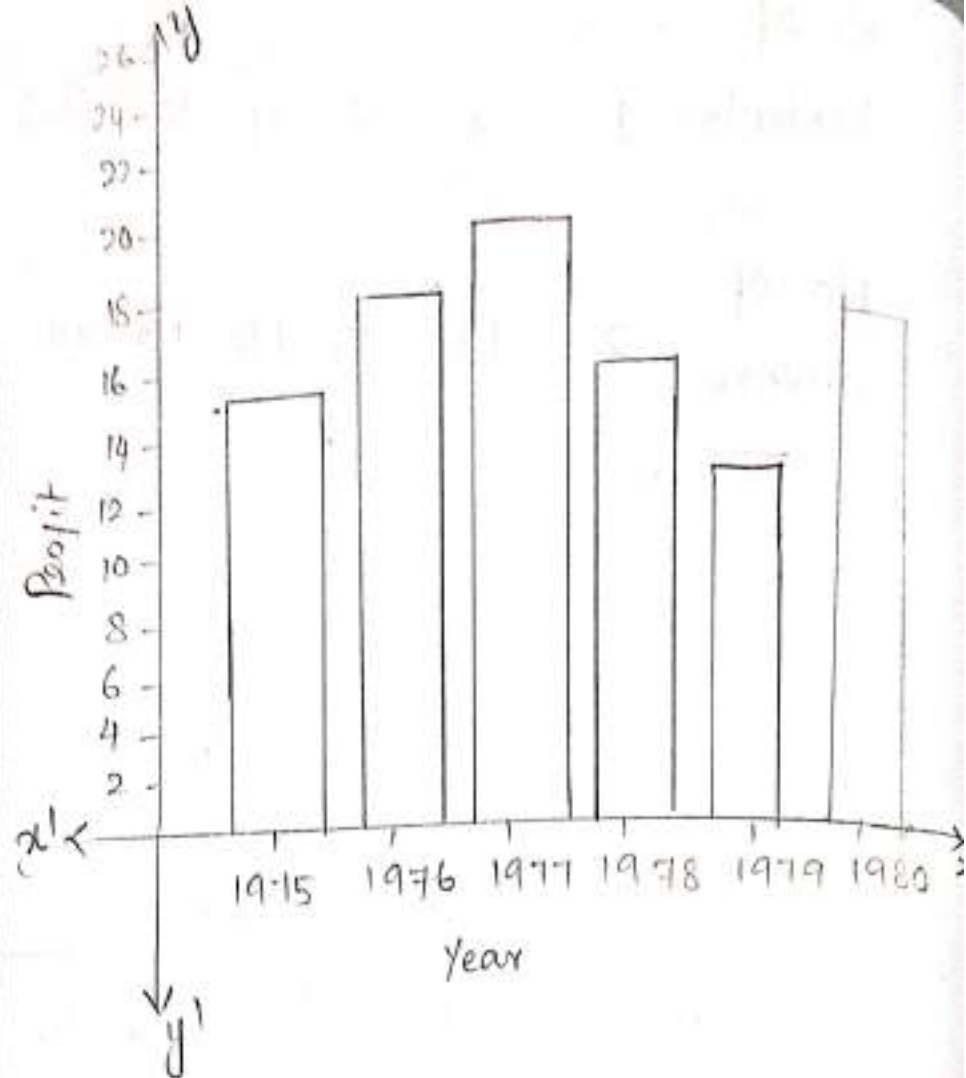| No. of Accidents	1	2	3	4	5	6	7	8
No. of Drivers	2	18	15	10	13	22	9	11
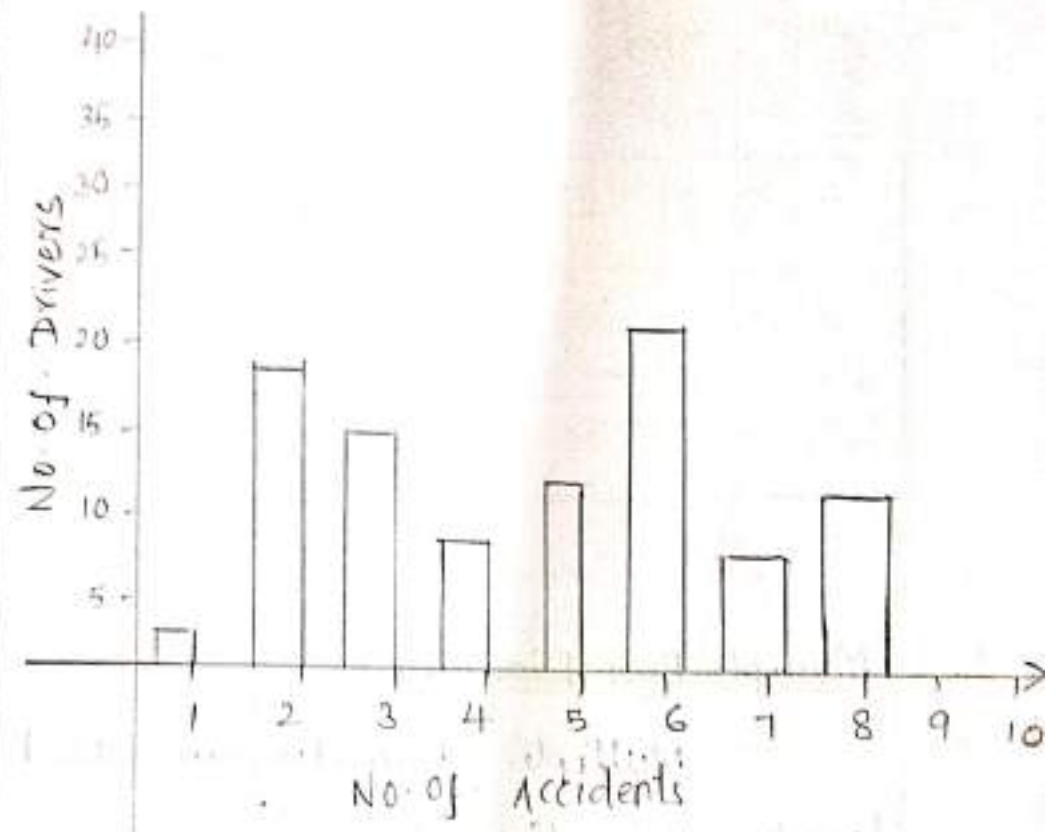
Simple Bar Diagram

Simple Bar Diagram

A Simple Bar Diagram can be drawn either on horizontal or vertical base.

Draw a Suitable bar diagram for the following data

Year	1975	1976	1977	1978	1979	1980
Profit	15	18	20	16	13	17

The y-axis is labelled **Profit** with values 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26. The x-axis is labelled **Year** with values 19·15, 1976, 1977, 1978, 1979, 1980.

Multiple Bar Diagram

Multiple Bar diagram used to denote more than one phenomenon.

Example;

Export and Import.

Multiple bars are useful for direct comparison between two values

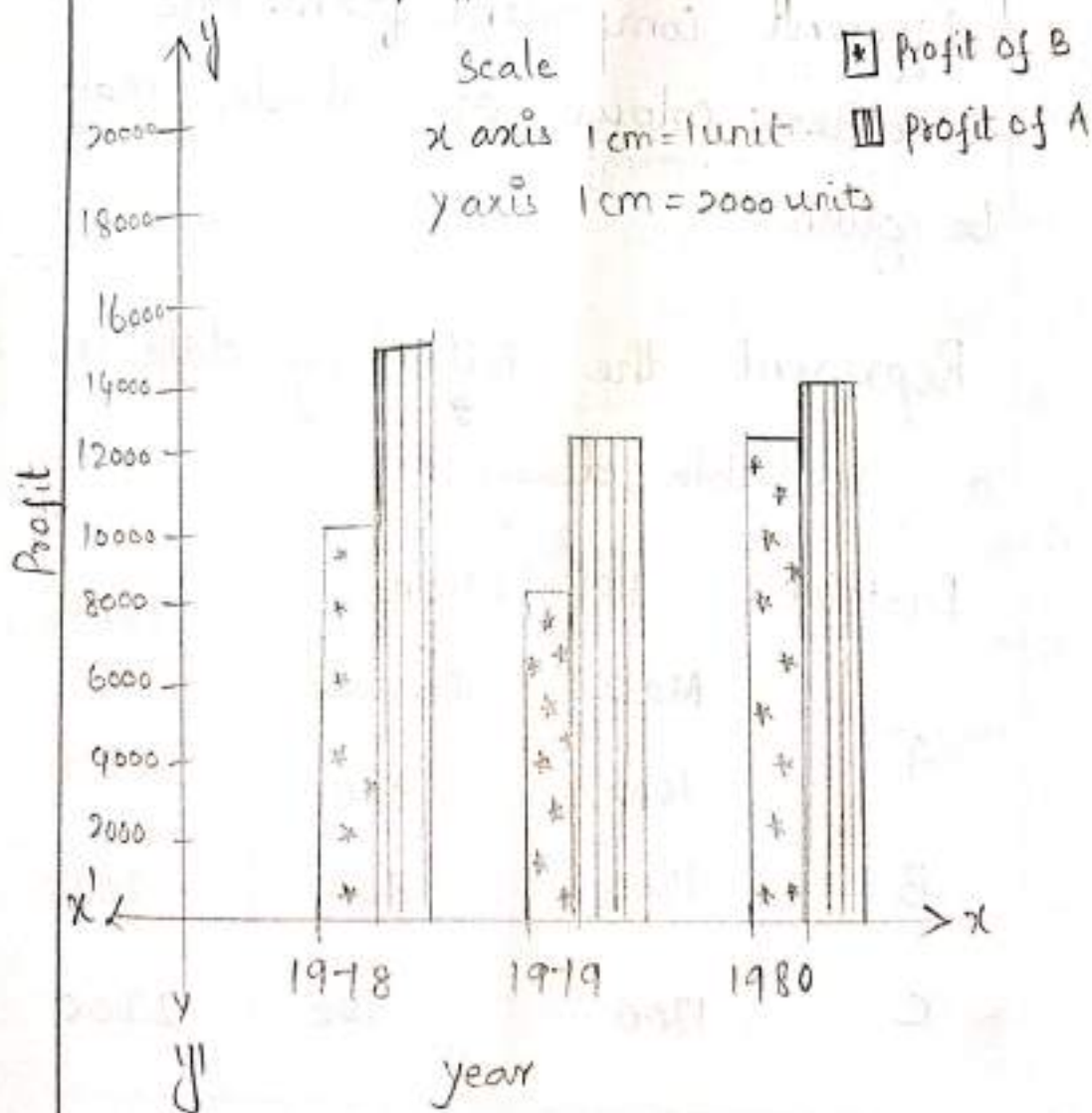To distinguish the bars different colour shades etc to understand or different bar.

Problems:

The data given below gives yearly profit of two companys A and B.

Draw a Suitable bar diagram.

Year	1990	1992	1994
A	10,000	8,000	13,000
B	16,000	13,000	14,000

Scale
x axis 1cm = 1 unit
y axis 1cm = 2000 units

▣ Profit of B
Ⅲ Profit of A

Subdivided Bar Diagram
Compound Bar Diagram

A Bar is Sub divided into Various Parts in proportion to the value given in the data and may be drawn on absolute figure or percentage. Each component occupies a part of the bar to its share in the total to distinguish different component from one another colour or shades may be given.

Represent the following data in a suitable diagram.

| District	Population		Total
	Male	Female	
A	1000	500	1500
B	1200	800	2000
C	1300	900	2200
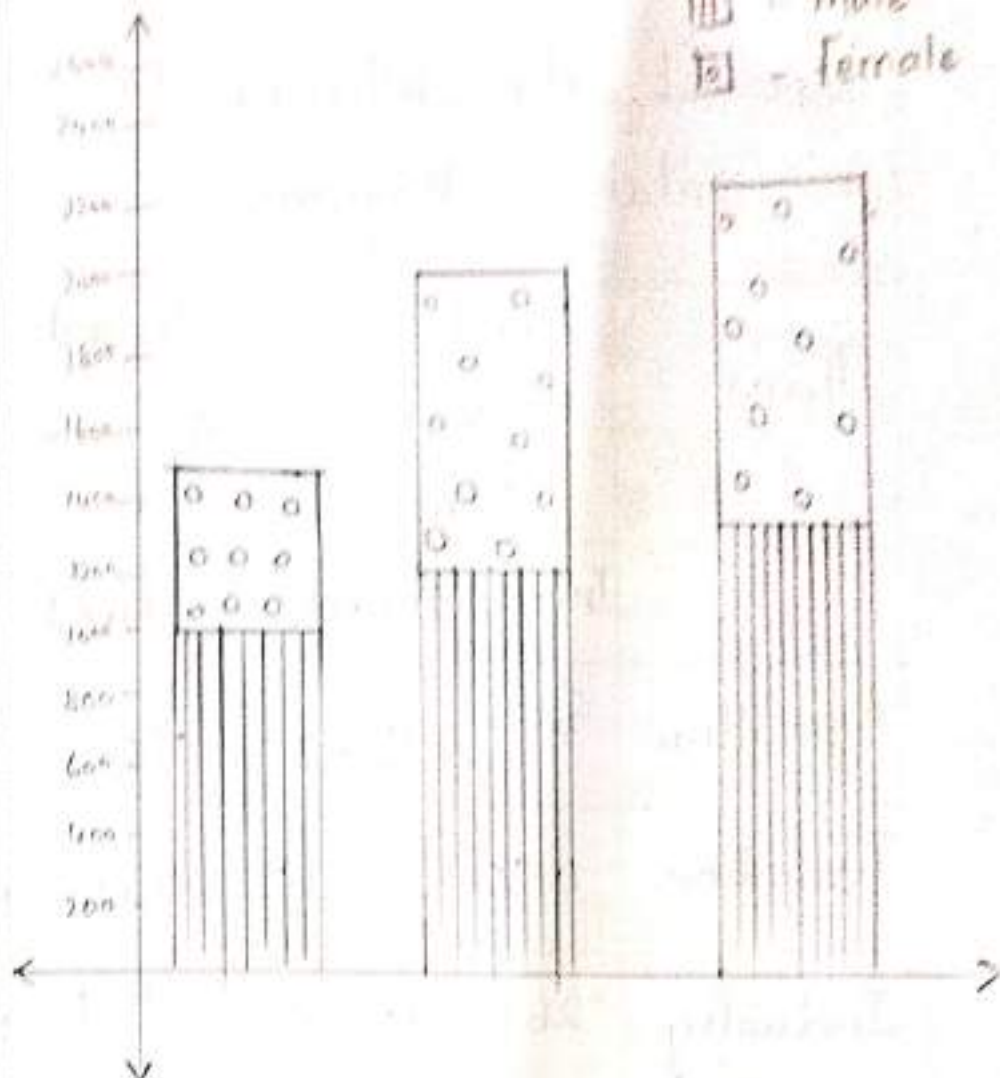
Percentage Subdivided Bar diagram

    The components are expressed as percentage to the total for dividing the bars bars. These percentage are cummulated. In this case the bars are all the equal height. Each segment shows the percentage of the total.

Represent the following data in a Suitable diagram.

Items	First 5-year plan		Second 5-year plan	
	Invest	Percent	Invest	Percen
Agriculture	357	16.53	768	14.23
Irrigation	492	22.78	990	18.34
Industry	261	12.08	909	16.84
Transport	654	30.28	1485	27.52
Social Service	306	14.16	945	17.51
Miscellaneous	90	4.17	300	5.56
	2160	100	5397	100

Legend:
- ▦ — Agriculture
- ☑ — Irrigation
- Ⅲ — Transport
- ▩ — Industry
- ⊞ — Social Service
- ▦ — Miscellaneous
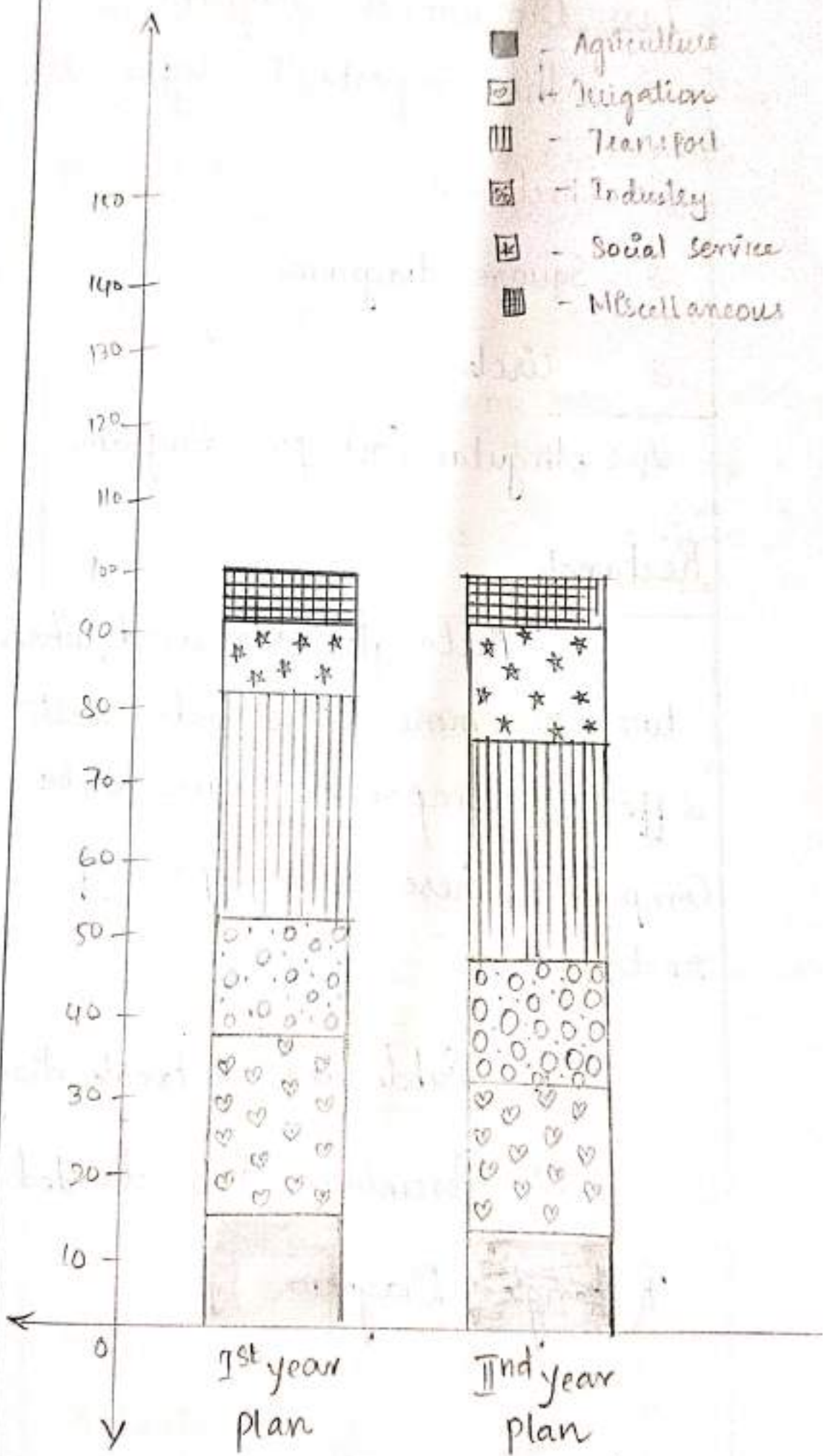
Two Dimensional Diagram

The important types are

1. Rectangle

2. Square diagram

3. circle

4. Angular (or) pie diagram

Rectangle

Rectangle are used when two or more magnitude with different components have to be Compared. These are types of rectangle.

1. Subdivided Rectangle diagra[m]

2. Percentage Sub divided Rectangle Diagram.

Square Diagram

To drawn a Square diag
the Square root is taken of the
values of the various item.

circle Diagram

circle diagram are alterna
to Square diagram the side of
Square will become the radius
of the circle.

Angular (or) pie diagram

A circle can be divided
into sectors. There are $360°$ at
the circle. the Sectors are out
taking the whole data equal to

OCEAN	AREA
Pacific	70.8
Atlantic	41.2
Indian	28.5
Antartic	7.6
Arctic	

ocean	Area	Degree
Pacific	70.8	$\dfrac{70.8}{152.9} \times 360 = 16.7°$
Atlantic	41.2	$\dfrac{41.2}{152.9} \times 360° = 97°$
Indian	28.5	$\dfrac{28.5}{152.9} \times 360° = 67°$
Antartic	7.6	$\dfrac{7.6}{152.9} \times 360° = 18°$
Arctic	4.8.	$\dfrac{4.8}{152.9} \times 360° = 11°$
	152.9	360°

- ⊚ Pacific
- ✴ Atlantic
- ⊡ India
- ▦ Antartica
- ∅ Arctic
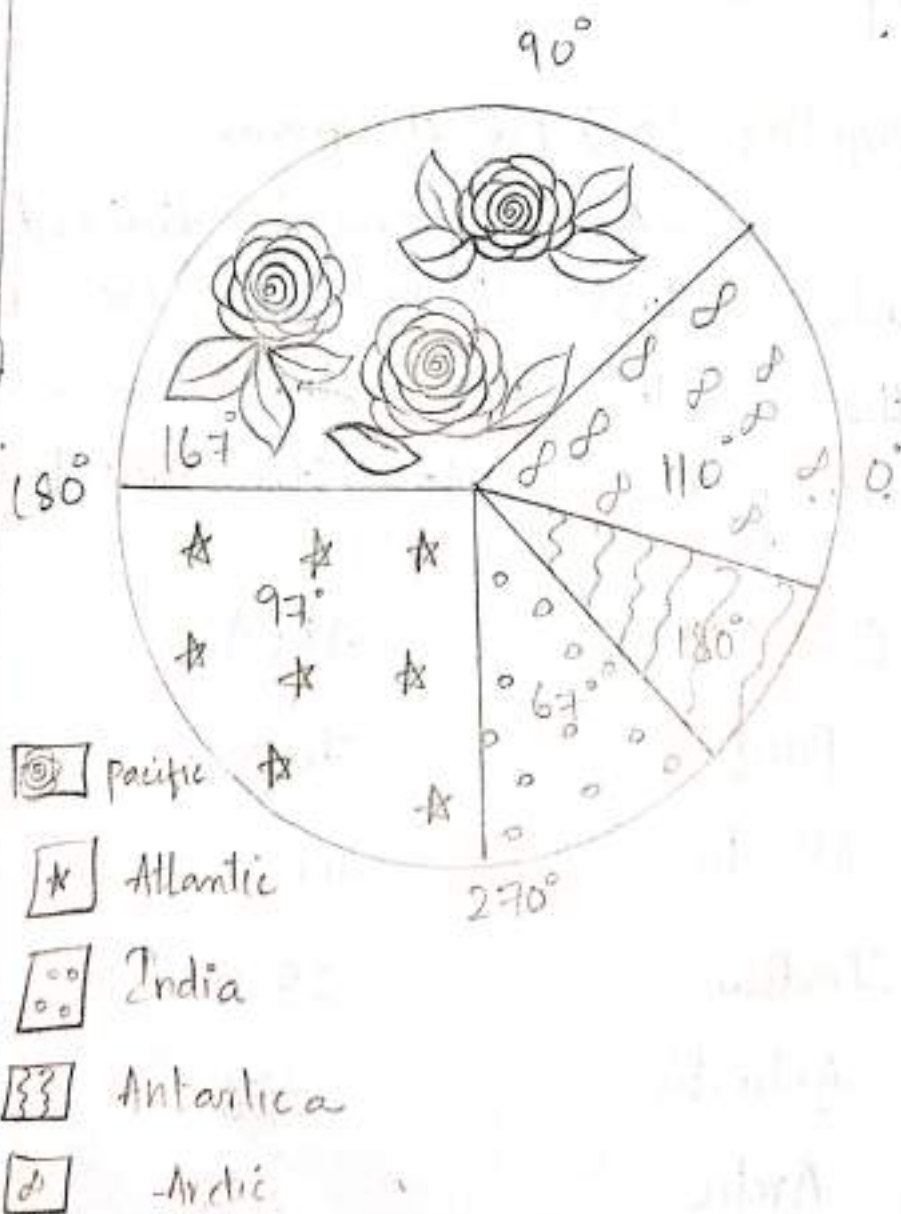
Pictogram

Pictogram is a device of representing Statistical data in Picture

They are very useful in attracting the attention

They are easily understand.

They are extensively used by Government Organisation as well as Private institution.

Cartogram

Statistical tools are presented through map accompanied by various type of diagrammatic representation

It present the numerical fact in a Pictorial form Cartogram in Simple and Easy to understand.

They are generally used when the regional or graphic geographic Comparison are to the mode.

Geographical Representation

→ Graphical Representation refers to the use charts and graphs to virtually display, analyse, clarify, and interpret numerical data, function and other qualtative Structure

Types of Graphical Representation
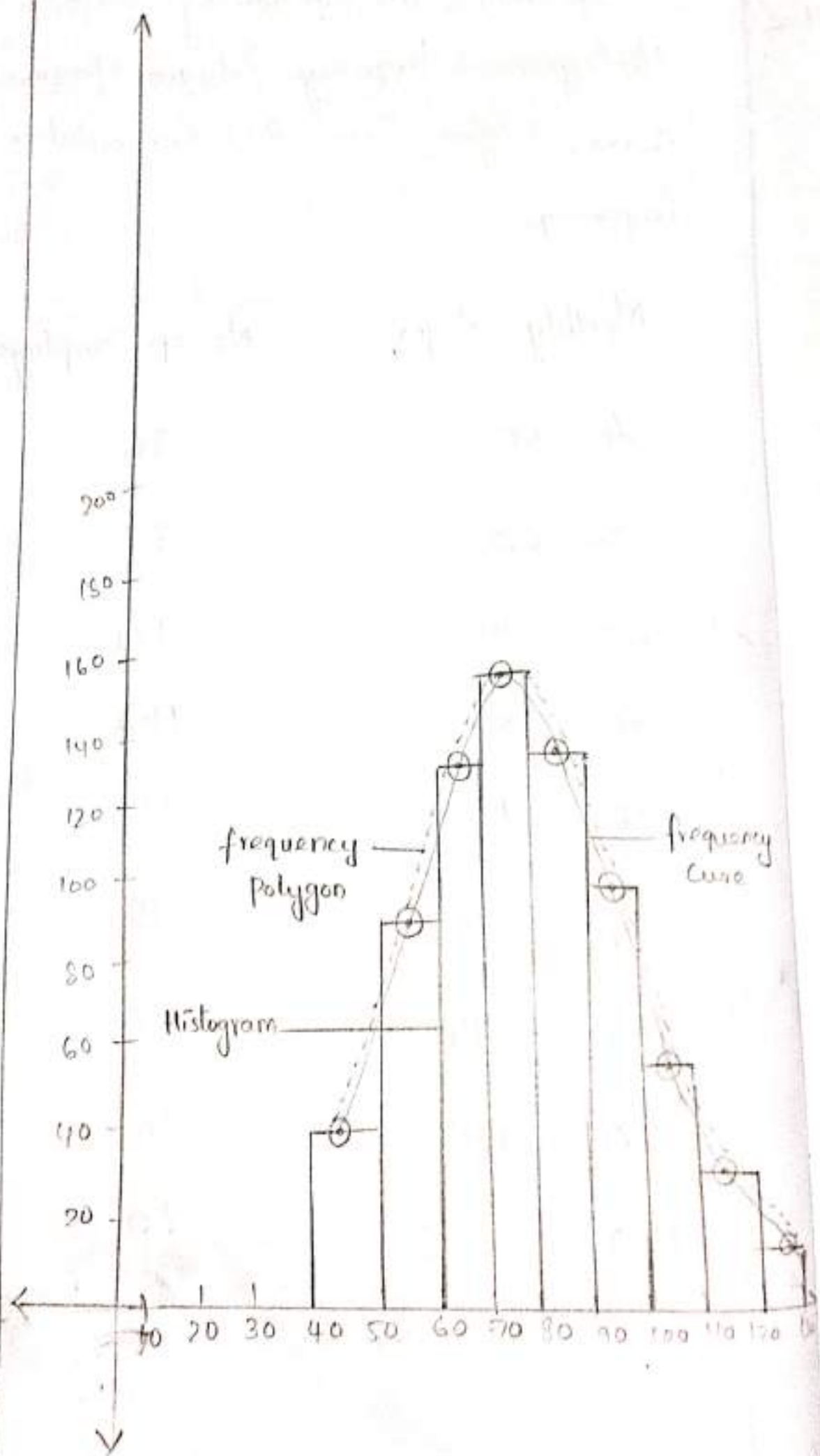
* Histogram [bar ⬛]
* frequency Polygon [......]
* frequency Curve [—]
* Ogive Curve or Cummulative frequency

Represent the following data in Histogram, frequency Polygon, frequency Curve, Ogive Curve (or) Cumulative frequency.

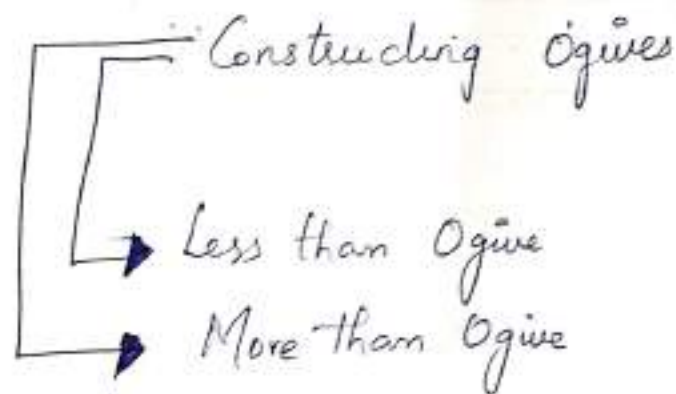| Monthly Wages	No. of Employees
40 - 50	36
50 - 60	87
60 - 70	121
70 - 80	154
80 - 90	133
90 - 100	95
100 - 110	50
110 - 120	30
120 - 130	10

Ogive Or Cummulative frequency

When Cummulative frequencies are plotted on graph, then the frequency curve obtained is called ogive or cummulative frequency curve.

Ogive determined. median, quartiles, Percentiles etc....

The class limits are Shown along the X axis and Cummulative frequencies along y axis.

There are two methods of

Constructing ogives

→ Less than Ogive
→ More than Ogive

Monthly Wages	No of Employees	Less than		More th...
40 - 50	36	40	0	716
50 - 60	87	50	36	680
60 - 70	121	60	123	593
70 - 80	154	70	244	472
80 - 90	133	80	398	318
90 - 100	95	90	531	185
100 - 110	50	100	626	90
110 - 120	30	110	676	40
120 - 130	10	120	706	10
		130	716	

Less than

No. of employees

1300
1250
1200
1150
1100
1000
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50

Monthly wages