19.02.20.

UNIT - II.

Diagrams and Graphs

Diagrams:

Diagrams are various geometrical shapes. Such as bars, circles, pie, etc.,

Graph sheets are not required for drawing diagrams. Diagrams are based on scale but are not confident to points or lines.

They are attractive and easy to understand, when graphs and are used in advertisement and publicity.

They are not useful for finding statistical measures such as median and mode.

They neither helps analysis of time series nor facilities at business forecasting and, Hence interpolation and extrapolation. A statistic or researches refer them least.

Diagrams Merits:

⇒ Most of the people are attracted by diagram.

✓ It is Human psychology that each shape state attract a criterion section of the population and each colour many people.

Here diagrams in different shapes and multicolours almost all human rays.

⇒ Technical knowledge or education is not necessary.

They are visual aids. Literary knowledge is not necessary for recognising the silent features of a diagrams

⇒ Time and effort required are less.

Tables or other forms of data take much valuable time. It is more difficult also to understand them.

⇒ Diagrams show the data in proper respective.

Comparison between section and the significants of each section are clearly known from the diagrams.

⇒ Diagrams leave a lasting impression.

Any diagram easily the memory and remains there for a long time.

⇒ Language is not a barrier.

The Language of description of a diagram is not known, a diagram in a book

can easily to betty understand.

⇒ Widely used tool.

Diagrams are used in almost all context for explaining or supporting new theories in text books by government for advertisement by all agencies and so on.

Demerits of Diagrams

⇒ Diagrams are approximation.

Vast and exact details can be given in the tables. Diagrams are drawn to the maximum possible approximation only.

⇒ Single diagram is insufficient to representating all the data of a complex table.

All the details are of a simple table can be represented by one diagram. But sometimes all the details of a complex table cannot be represented by one diagram.

⇒ Minute differences in values cannot be represent property in diagrams.

⇒ Large differences in values spoil the look of the diagram.

⇒ Diagrams are intended to supplement tables but not to substitute them.

⇒ sum of the diagrams can be drawn by experts only.

⇒ Incomponent and unsurpluses and can misuse diagrams.

⇒ Different scales property different pictures to layment.

TYPES OF DIAGRAMS.

The frequently used Diagrams are divided into the following four heads.

1. One Dimensional Diagrams (Bar Diagrams).

2. Two Dimensional Diagrams. (Pie Diagrams, Rectangles, squares, and circles).

3. Three Dimensional Diagrams (cubes)
4. Pictograms and cartograms.

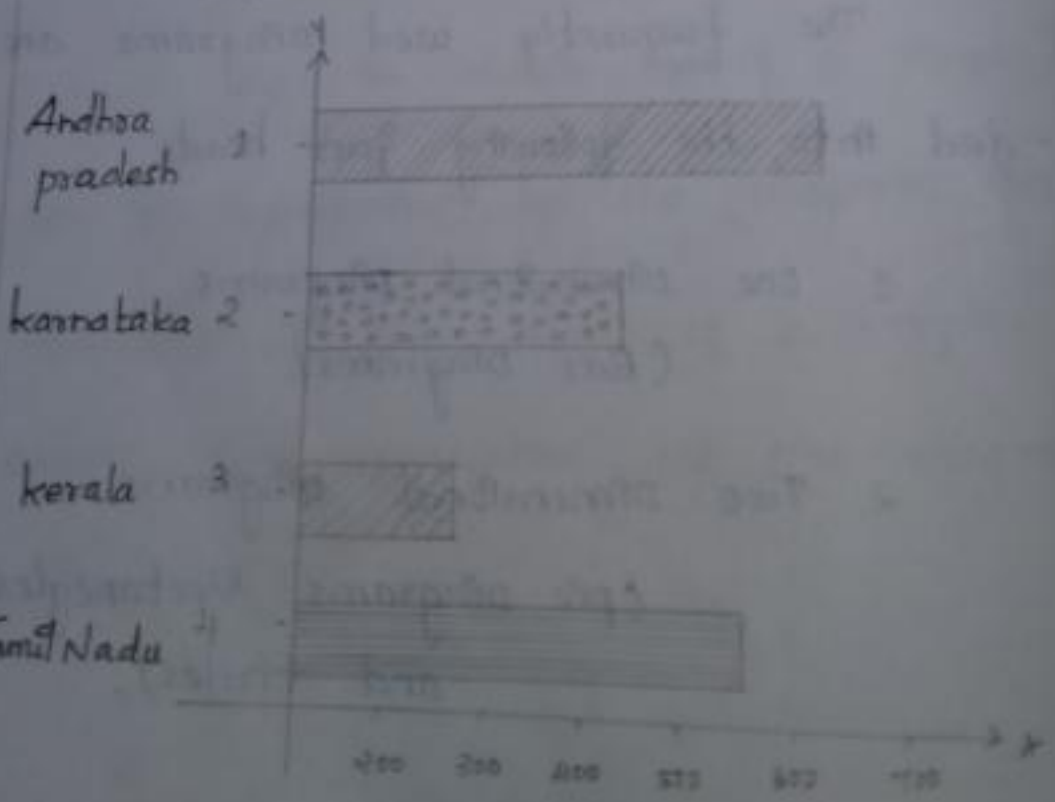
=> Simple Bar Diagrams:

03. Population of the four southern states of India in 1991 is given below represent the data by means of suitable Diagrams.

State	Population in lakhs.
Andhra pradesh	663
Karnataka	448
Kerala	290
Tamil Nadu	556

Sol:

population in south state of India 1991.



Multiple Bar Diagram:

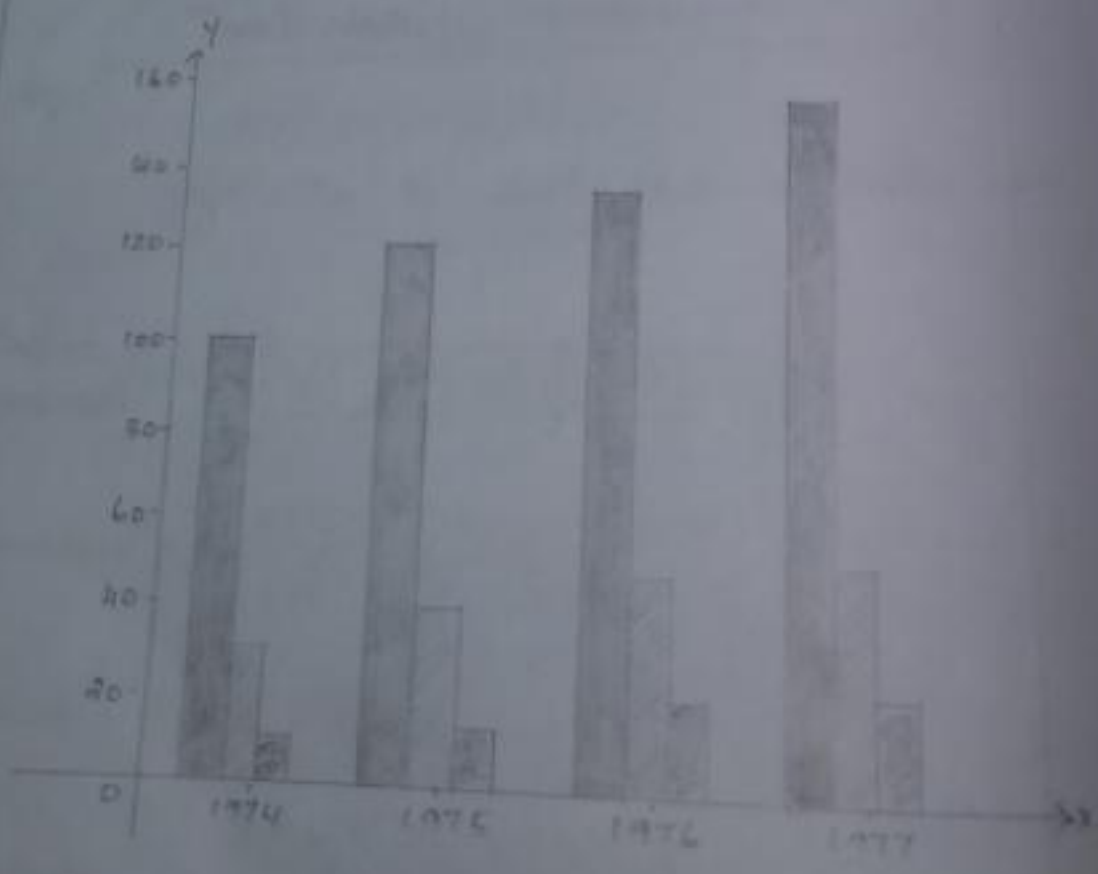
It is suitable when component to be compared with in each group

1. Draw a multiple Bar diagram for the following data.

year	Sales (000 Rs)	Gross profit	Net profit.
1974	100	30	10
1975	120	40	15
1976	180	45	25
1977	150	50	25.

Soln:

Sales and Gross profit and Net profit in the year 1974 - 1977.



PIE DIAGRAM

pie diagram consist of one or more circles which are divided into a number of sector

suitability:

It is suitable whenever the relative proportions or proportions of the components, which make of the total are to be related or revalued it is used to represent the expenses of families or governments on different heads and revenues from different sources. The pie diagram is so called because the circle looks like a pie and the sector cut from the pie

pie diagram is an important and a popular means of representation.

circles are more attractive than squares. Even when there are more than four components pie diagram remains effective unlike a component bar diagram

pie diagram has a few limitations. It is less effective than bar diagrams for comparison interpretation.

More than three sets of values could not be purposefully presented in a single diagram for better more than eight sector in a circle.

27.02.2020.

1 case 1 :

One circle :

Step 1 : when ever one set of actual amounts or percentage are given find the corresponding angles in degree by using the following formula.

$$\text{Angle} = \frac{\text{Actual Value}}{\text{Total of Actual Value}} \times 360$$

(or)

$$= \frac{\text{Percentage}}{100} \times 360.$$

$$= \text{percentage} \times 3.6$$

Angles are taken to the nearest integral values when the values obtain by the above formula are fractions but have been rounded of to the nearest integers, the total of the angles may not be 360°

sometimes. Then one (or) more of the rounded of values are to be revised responsibly (or) reasonably to get the totalised 360°.

Step 2:

Using a compass draw a circle of any convenient layer radius. Convenient in the sense that it looks neither too small nor to big on the paper.

Step 3:

Using a protector divide the circle into sectors whose angles have been calculated in Step 1. Sectors are to be in the order of the given items.

Step 4:

Sketch One colour are design to each sector

Step 5:

write the title, index and identification Number

1 Draw a suitable diagram to represent the following submitted as part of the budget proposal of a government of India for the year 1995-1996

Item of expenditure	Percentage
1. Interest	26
2. Defence	13
3. Subsidies	6
4. other non-plan expenditure	10
5. States share of taxes and duties	15
6. Non-plan assistance to State and UT Govts	6
7. State and UT plan assistance	10
8. Central plan	14.
Total	100

Item of expenditure	Percentage	Angle in degrees
Interest	26	93
Defence	13	47
Subsidies	6	22
Other non-plan expenditure	10	36
States share of taxes & duties	15	54
Non-plan assistance to state and UT Govts	6	22
State and UT plan assistance	10	36
Central plan	14	50
Total	100	360

- Interest
- Defence
- Subsidies
- Other Non-plan expenditure
- States share of taxes & duties
- Non-plan assistance to State and UT Govt.s
- State and UT plan assistance
- Central plan.

Q2 Draw a suitable diagram to represent the following data:

Item	Family A	Family B
Food	240	300
clothing	160	300
Rent	80	200
Other expenses	200	400

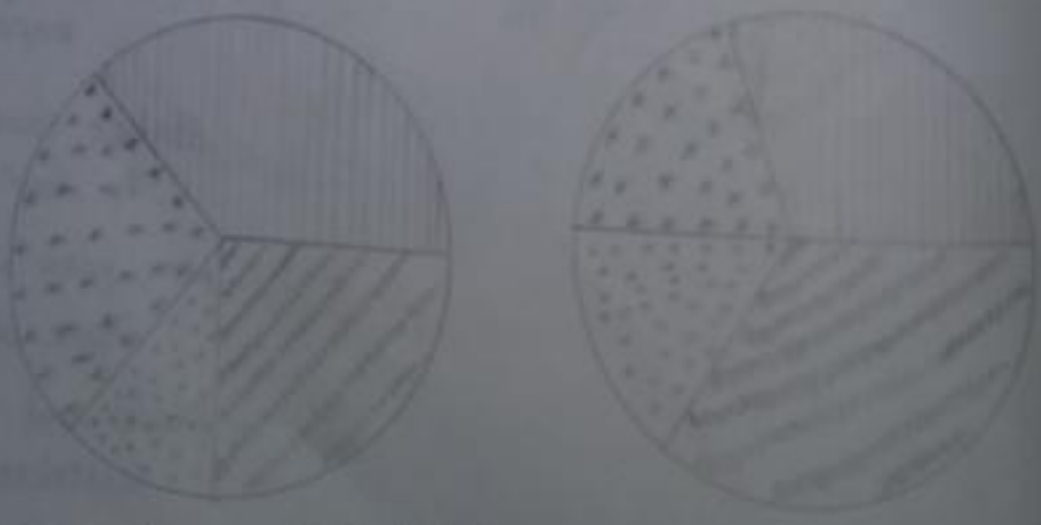
Soln:

Item	Family A	Family B	Angle in degree Family A	Family B
Food	240	300	127	90
clothing	160	300	85	90
Rent	80	200	42	60
Other Expenses	200	400	106	120
Total	680	1200	360	360

$R_1 : R_2 = \sqrt{680} : \sqrt{1200} \rightarrow 26.08 : 34.64$

$R_1 = 26.08/16 = 1.6''$ $R_2 = 34.64/16 = 2.2''$.

Expenditure of Families A and B.



Food clothing Rent other expenses

K has been taken as 1/16 in the above example.

$R_1 = K\sqrt{T_1}$, $R_2 = K\sqrt{T_2}$, then

Represent the following data by a three dimensional diagram.

Area under sugarcane in various states (1973-1974)

Uttar Pradesh - 6,07,430 acres

Bihar - 3,56,750 acres

M Pradesh - 1,54,220 acres

Tamil Nadu - 36,875 acres

Soln:

State	Area in acres	Cube root	sides of the cubes
U.P	6,07,430	84.7	2.1
Bihar	3,56,750	70.9	1.8
M.P	1,54,220	53.6	1.3
TN	36,875	33.3	0.8

Area under Sugarcane (1973-1974)

24.02.2020

Pictograms and Cartograms

Pictograms:

Pictogram consist of pictures of things regarding which the data are above.

For a data on human beings the pictures of persons are drawn, for a data on trains the pictures of trains are drawn, etc.

The Numbers indicate the growth and the decline of the things.

Merits:

They are more attractive than any other type of diagram. In exception fairs and other places, they are promptly placed to attract one and all.

The features are noticed easily and are remembered for a long time. So advertisement use this kind of presentation largely.

Limitation or Demerits:

Pictograms are limited to construct, drawing a large number of pictures.

without any noticable difference is difficult.

Q5. Draw a pictogram to represent the following

Year	No. of houses newly electrified
1979-80	42,286
1980-81	51,104
1981-82	60,346
1982-83	77,870

procedure:

Each light might represent 10,000 houses newly electrified and hence the diagram is as follows.

Year	No. of houses Newly electrified.
1979-80	
1980-81	
1981-82	
1982-83	

cartograms:

Cartograms are statistical maps. They are used to represent Quantitative information on Geographical Basis The Quantities can be shown in many different ways on

the maps such as colours, designs, pictograms and numerals.

The Geographical pattern that may be concluded in the data is revolved.

Geographical comparisons are made easy

cartograms are difficult to construct

a. On the basis of some quantitative variations such as rainfall, popuplation and population growth, the various regions may be classified into different class as shown in the cartogram by using different designs.

The diagram follow, shows the decennial population growth rate of various state and territories of India during 1981- 1991.

The lowest growth rate was in State like Tamil Nadu and kerala.

The highest growth rate are 50.5% was recorded in delhi.

Union territories A and N Islands and chandigarh, head the second highest

02.08.20

Difference between a Graph and Diagram:

are given in the following table

Graph	Diagram.
⇒ Graph consist of points lines and curves.	⇒ Diagram is a geometrical shapes. such as circle. etc.
⇒ This is drawn on the graph sheet.	⇒ Graph sheet is not required.
⇒ Numerical Variation is in two directions and scales are choosen for both the axis	⇒ Numerical Variation is usually in one direction and so, mostly. scale is needed for that axis along
⇒ Mathematical relation between two variables is shown by regression line best possible curves given by the method of least squares can be drawn.	⇒ Mainly useful for visual comparisons
⇒ Less attractive and requires more attention to understand	⇒ More attractive and understand the nature of the data

⇒ In statistical analysis, presentation of data and research.

⇒ Quartiles, Median, Mode, etc. can be found

⇒ Useful for analysis of time series business forecasting, extrapolation and inverse interpolation

⇒ In advertisement and publications, publishers of the data are not obvious

⇒ Quartiles, Median, and Mode cannot be found

⇒ Not useful for analysis of time series, Business forecasting, interpolation, extrapolation & inverse interpolation

classification and Tabulation:

Individual observations are called raw data. When there are a large number of individual items, it is really difficult to known the nature of data.

classification:

classification is the process of arranging data into groups or classes according to the common characteristics processed by the individual items

The process of grouping a large number of individual factors or observations on the basis of similarity among the items is called classifications

objects:

1. Mass data can be reduced physical and simplified Marks of 3,1,649 students after classification into 6 class as explained above will be better to understand

2. classification is to separate the similar things from the dissimilar things and there by to bring out the salient factors.

3. These enables comparisions of one class of data with another

4. This helps in studying the relation-ship between several characteristics

5. This is a means to access a data properly

6. Important factors can be seen at a glance.

7. classified data are suitable for further statistical analysis

8. These paves way for tabulation

Basis:

Data can be classified on the basis of one or more of the following.

- ✓ Geography
- ✓ chronology
- ✓ Quality
- ✓ Quantity
- ✓ (or) spatial

Geographical classification:

Some data can be classified area wise, such as states, towns, etc.,

Data on public limited companies.

Ex. In India can be classified as shown below. then central India, west, North.

Region	Number of companies.
Central India	-
west "	-
North "	-
East "	-
South "	

Chronological or Temporal or Historical classification:

Some data can be classified on the basis of the time and arranged chronologically (or) Historically.

The data on public limited companies can also be classified as shown below

Region	No. of companies
1990 - 91	
1991 - 92	
1992 - 93	
1993 - 94	
1994 - 95	

Qualitative classification:

Some data can be classified on the basis of attributes (or) characteristics.

The strength of a college can be given sex wise (Gender wise) or class wise, (or) subject wise. These are Qualities.

Sex	No. of Students
Male	1407
Female	588
Total	1945

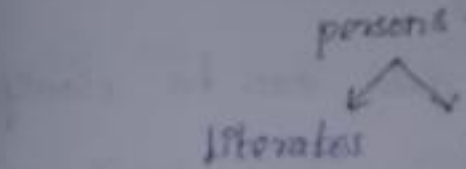
Qualitative classification can be of two types as follows

=> Simple classification

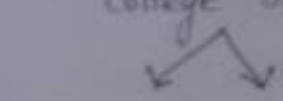
=> Modified classification
Manifold

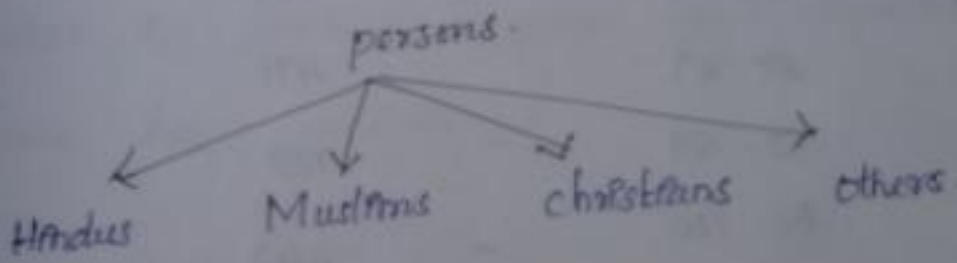
1. Simple classification:

This is based on only one quality. This may be either or modified some of the attributes are of the nature. then they are present or absent in any units



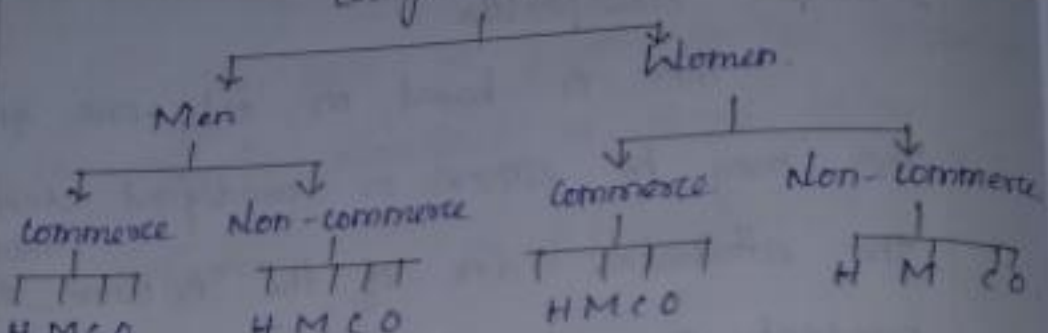
Similarly.





2. Manifold classification:

The college students can be classified on the basis of three attributes sex, subject of study and Religion as follows



Quantitative classification:

Some data can be classified in terms of magnitudes. The data on the students of the college are available below as per their marks.

Marks		No. of students.
0-39	-	124
40-49	-	471
50-59	-	908
60-100	-	442
Total	-	1945

One-way classification.

One way classification means classification of data on the basis of only one consideration. All the examples seen so far except the one under manifold classification are of this kind.

Marks	No. of students.		
	Males	Females	Total
0 - 39	123	1	124
40 - 49	314	157	471
50 - 59	709	199	908
60 - 100	261	181	442
Total	1407	538	1945.

Two - way classification.

two - way classification ⇒

Three way tables are given later. In another example four aspects have been considered.