...i Naachiyaar Govt. Arts College (W) Autonomous,
Thanjavur
Non Major Elective Course – 1 **18K3SELO1**
Statistical Methods **Hrs:2**
Credit:2

Unit – I

Definition of Statistics – Characteristics, Uses in business and limitations of statistics.Classification- Types – Tabulation – different parts of Table and Types.

Unit – II

Collection of data - Definition of primary and secondary data – methods of collecting primary data and secondary data.

Unit – III

Diagrams – Definition and uses – Types of diagrams – simple bar, sub-divided, multiple bar diagrams and pie diagram- Simple Problems.

Unit – IV

Graphs – Definition and uses, difference between diagrams and graphs. Types of graphs – Histogram, frequency polygon and frequency curve - Simple Problems.

Unit – V

Sampling – Definition of population, Sample, parameter, statistic. Difference between census and sampling – Merits and demerits of sampling. Methods of sampling – Simple Random Sampling – Stratified and Systematic sampling.

Books for Study :

1. Statistics – R.S.N. Pillai & V. Bagavathi
2. Statistical Methods – S.P. Gupta

Unit - 1

STATISTICS

Definition:

1. "Statistics may be called the science of Counting"
   - A. L. Bowley

2. "Statistics may be defined as the Collection, presentation, analysis and interpretation of numerical data"
   - Croxton and Cowden.

Characteristics:

1. Statistics are aggregate of facts:

This means that a single or isolated fact, through numerically stated, Cannot be called as statistics. Statistics deals with groups, but not individual items. For instance. One accident, one birth, one death, etc., Cannot be called as statistics. But the aggregate of figures relating to accident, births, deaths, etc, over different items or places Can be called statistics. This is because the study goes in relation to each other and is Capable of Comparison.

A single accident is not statistics. But the total number of accidents of a city during a month or a quarter or half-year is statistics. The total of accidents in the city during a mont Can be Compared with those of the previous months to Know the accidents have decreased or increased. This Can also be Compared with other Cities.

2. Statistics are affected to a marked extent by Multiplicity of Causes:

~~Statistical data~~ Quantitative data or statistical data are influenced by a number of factors. Social sciences, economics, history, sociology etc., are affected by many factors. Statistics is most commonly used in social sciences. In physical seiences, it is possible to isolate the effect of various factors on an item, because the effect of one cannot be measured numerically. One cause alone cannot be said to be responsible to given data. For instance, the fall in sales of a commondity is affected by a number of factors supply, demand, market condition, general recession in trade, storage facility, Currency Circulation import, export, Compentition in market, Consumer taste, etc., It is not possible to single out one cause. All these factors acting jointly will determine the factors responsible for the decline of sales.

3. Statistics are numerically expressed:

Numerical data alone constitute statistics. Students can be classified very good, good, average, poor, etc., on the basis of their performance in tests. But they are in qualitative expressions and are not statistics. In particular, the qualitative characteristics honesty, beauty, ~~integ~~ intelligence, etc., which cannot be measured numerically are not statistics. If they are expressed by giving certain scores (Marks) as numerical standards, then they can be called as statistics. Another example is beauty competition of girls; if ranks are assigned, then the ~~quantitative~~ quantitative measure of beauty of the girls can be regarded as statistics.

4. Statistics should be enumerated or estimated:

The numerical data pertaining to any field of enquiry can be obtained either by enumeration or by estimation. If the field of enquiry is not large, enumeration is can be conducted. If the field of enquiry is wide and large, enumeration is out of question: and ~~be conducted~~ it can be estimated.

5. Statistics should be collected with reasonable standard of accuracy:

If reasonable standard of accuracy is needed in bulk enumeration and estimation. For instance, if the weights of students are being measured fractions of kilogram (say 1/10th or 1/20th) can be ignored: when measuring the distance from madras to kanyakumari fraction of a kilometer can easily be ignored. No hard and fast rule can be laid down for all cases. Hence mathematical accuracy cannot be attained in statistical studies.

6. Statistics should be collected in a systematic manner for a pre-determined purpose:

The data should be collected in a systematic ~~manner~~ manner through some suitable plan. If not, there will be wastage of time, energy and ~~money~~ money. For instance, when we collect the income data from rich people, ignoring the poor, it will only inflate the national income data. The purpose of data collection must be decided in

in advance, and the investigator must be aware of the purpose. If the objects is not known to the investigator, it is possible that he may collect unnecessary data, which may be not be of any use while ignoring necessary data. Thus, without a pre-determined ~~pur~~ purpose, the collected data may not yield the desired results.

7. Statistics should be placed in relation to each other:

Statistical data are mostly collected for the purpose of comparison. In order to make valid comparison, the data should be homogeneous, ie, they should be relate to the same phenomenon or subject. For instance, weights of the boys in a class are to be compared with the corresponding weights of boy in another class. But it would be meaningless to compare the height of the students with the height of trees.

Uses in Business:

The bigger the concern, the greater is the needs for statistics. In good old days, business was confined to limited units, when production was in handicraft stage. But today business people have to face cut-throat competition and similar problems. These problems will be solved through statistical analysis. To know if the losses were due to under or overstocking, untimely purchases, inexact estimates, uneconomic prices, etc. etc., a businessman analysis

the problems with the help of statistics. Statistics to a great extent helps business to make maximum profits. A trader estimates the demand of his products. He decides the quality and quantity of goods to be produced. All the activities of the business are concentrated and helped by statistics. If the estimates of demand are correct, the businessman makes good profits; if underestimated, he loses the chances of making profites; if overestimated, he finds it difficult to push the products; but simply blocks the finance in stocks. Boddington observes, "The successful businessman is the one, whose estimate most closely approaches the accuracy". Therefore by looking to the statistics of past years, he predicts a good estimate for the future.

In the words of Ya-Lum-Chou, "In business, statistics has already made ~~so~~ radical changes in maintaining and improving output quality, in selecting and promoting personnel, in efficient use of materials, in projecting long-term capital requirements and forecasting sales, in estimating Consumer's preferences, and in various other phases of business research and management. It is not an exaggeration to say that to day nearly every decision in business is made with the aid of statistical data and statistical methods."

A promoter is greatly helped with statistics. By analysing the situations through collected statistics. the promoter decieds the location of business, financial reason resources, marketing of the products, availability of labourers, etc. For all these activities statistics is the guide. King says, "Statistics is like clay of which you can make a God or Devil as you please."

Ya-Lin-Chou says, "statistics is a methods of decision-making in the face of uncertainty on the basis of numerical data and calculated risks". Therefore careful study of statistical data and their analysis will open the doors of success in business.

Limitations of Statistics:

1. Statistics does not deal with individual items:

Statistics deals with groups of or aggregates only. The scope of statistics lies outside the study of individual fact. The per capita income is obtained by dividing the total income by the total population. The per capita incomes does not reveal the poverty of individuals. King states, "Statistics from the very nature of the subject cannot and never will be able to take into account individual cases". Statistics proves inadequate, where one wants to study individual cases. Thus it fails to reveal the true position.

2. Statistics deals with quantitative data only!

Statistics is numerical statement of facts. statistics deals with only the quantitative data. For example, per captia income, population growth, etc. Can be studied by statistics; but qualitative aspects such as honesty, intelligence, poverty, efficiency, blindness, deafness, etc, cannot be studied directly. It may be possible if they are converted into numerical facts. According to prof. Horace Secrist. "Some phenomenon cannot be quantitatively measured; honesty, resourcefulness, integrity, goodwill, all important in industry as well as in life, are generally not susceptible to direct ~~stics~~ statistical measurement. "If we Convert the qualitative data into quantitative data, comparision is possible.

3. Statistics May mislead to wrong Conclusion in the absence of details:

If figures are given without details, we may arrive at wrong and misleading conclusions.

4. Statistical laws are true only on average!

Laws of physical sciences are perfect. But statistical laws are not so perfect as the laws of physics or chemistry. statistical results are true only on the average. According to W.I. King "statistics largely deals with averages and these may be made up of individual items

radically different from each other. statistics are the means and not a solution to the problem.

5. Statistics does not reveal the entire story:

Statistics simplifies complicated data. Before using the data, the background of the data may be studied. Marshall says", Statistics are the straws out of which, I like every other economist to have to make bricks."

6. Statistical data should be uniform and homogeneous:

Comparion is one of the important characters of statistical data. Uniform and homogeneous data can be compared. Unequal or Uncomparable data will direct to wrong and misleading results.

7. Statistics is liable to be misused:

It is the most important limitation of statistics. According to Bowley, "Statistics only furnishes a tool through imperfect, which is dangerous in the hands of those who do not know its use and deficiencies. Statistics is good tool to an ~~exp~~ expert, like a sharp knife which is a good tool to gardener but it is a bad tool to a baby. Who is likely to be hurt by it. Statisticians must know the use and limitations of statistics. only then they can make use of it to get fruitful results and avoid dangerous, wrong and misleading results. It will be of great help only if it is utilized by an expert.

classification.

meaning of classification :-

classification is the process of arranging the available facts into homogeneous groups or classes according to resemblances and similarities.

Definitions :-

"classification is the process of arranging things (either actually or nationally) in groups or classes according to their resemblances and affinities, and giving expression to the unity of attributes that may subsist amongst a diversity of individuals..."

- R.L. Connor.

"classification is the process of arranging data into sequences and groups according to their common characteristics, or seperating then into different but related parts..."

- Secrist.

"The process of grouping a large number of individual facts or obser-vations on the basis of similarity among the items, is called classification".

- Stockton and clark.

chief characteristics of a classification are :-

1.) All the facts are classified into homogeneous groups by the process of classification.

2.) The basis of classification is unity in diversity.

3.) classification may be either real or imaginary.

4.) The classification may be according to either similarities or dissimilari-ties.

5.) It should be flexible to accomodate adjustments.

Objects of classification :-

1.) The cheif objectives of classification are :

2.) to condense the mass of data

3.) to present the facts in a simple form.

4.) to bring out clearly the points

of similarity and dis-similarity.

5.) to facilitate comparison.

6.) to bring out the relationship.

7.) to prepare data for tabulation

8.) to facilitate the statistical treatment of the data.

9.) to facilitate easy interpretation.

10.) to eliminate unnecessary details.

Rules of classification :

It is important that classi-fication should possess the following guiding principles.

(a.) **Exactness :**

The classes should be rigidly defined. They should not lead to any ambiguity or confusion

(b.) **Mutually exclusive :-**

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

(c.) **Stability :**

only one principle must be maintained [i.e., the same pattern of classification] throughout the analysis. Then only it will

facilitate meaningful comparison and become an ideal classification.

(d.) Flexibility :-

The classification should be flexible and easy to adjust to new situations and circumstances.

(e.) Suitability :-

The classification should be suitable for the object of the enquiry.

(F) Homogeneity :-

The items included in each class must be homogeneous for example, a classification into employed and unemployed youth is not adequate to judge the effect of education ; but further, each of them may then be classified into literate and illiterate.

(g.) Mathematical accuracy :-

items included in total and sub totals of each class and sub-class must be the same. Therefore, mathematical accuracy is very important in the classification of data.

Types of classification-

The classification of data primarily depends on the purpose and objecti-ves of the enquiry. There are four important types of classification. They are :

* Geographical i.e., areawise or regionwise or districtwise.
* chronological or historical i.e., on the basis of time.
* Qualitative by character or by attributes.
* quantative or numerical or by magnitudes.

Geographical classification (spatial):-

In geographical or spatial classi-fication, the basis of classification is the geographical or locational differences between various items in the statistical data like states, districts, cities, talukas, regions, zone, area, etc.. Geographical classification is illustrated in the following table :

Sales data (of pressure cookers) for 1996 (T.N)

Name of town	number of cookers.
Madras	15,000
Tiruchi	13,000
Madurai	11,000
Coimbatore	8,000
Kanyakumari	4,000

Chronological classification :-

This type of statistical data is classified according to the time of its occurrence, such as years, months, weeks, days, hours, etc. For example, census data are expressed in decades, national income is expressed every year, departmental sales are expressed every month or week.

Time series are also called chronological classification. They are further classified into the period of time and at the point of time. statistical data regarding population, imports, exports, sales in a firm, etc., also come under

this classification.

chronological classification is illustrated below:

population of india from 1921 to 1981

year	population (in million)
1921	248
1931	276
1941	313
1951	357
1961	438
1971	536
1981	684

Qualitative classification:

When the data are classified according to some quality or attributes, such as sex, honesty, intelligence, literacy, blindness, colour, deafness, religion, marital status, etc., the classification is termed as qualitative or descriptive attributes. In this type we can only find out the presence or absence

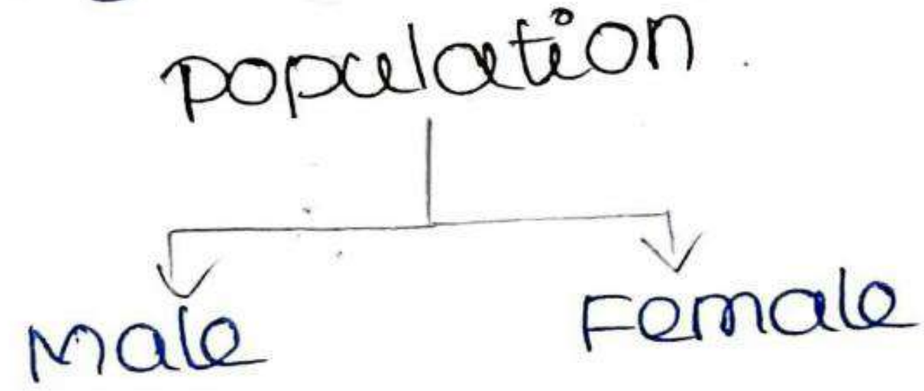
of the attributes, in the given units.

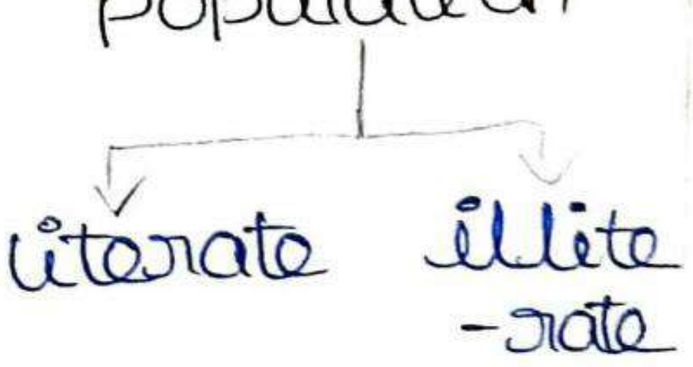
This again can be classified into two types:

* simple classification.
* manifold classification.

a) simple classification:

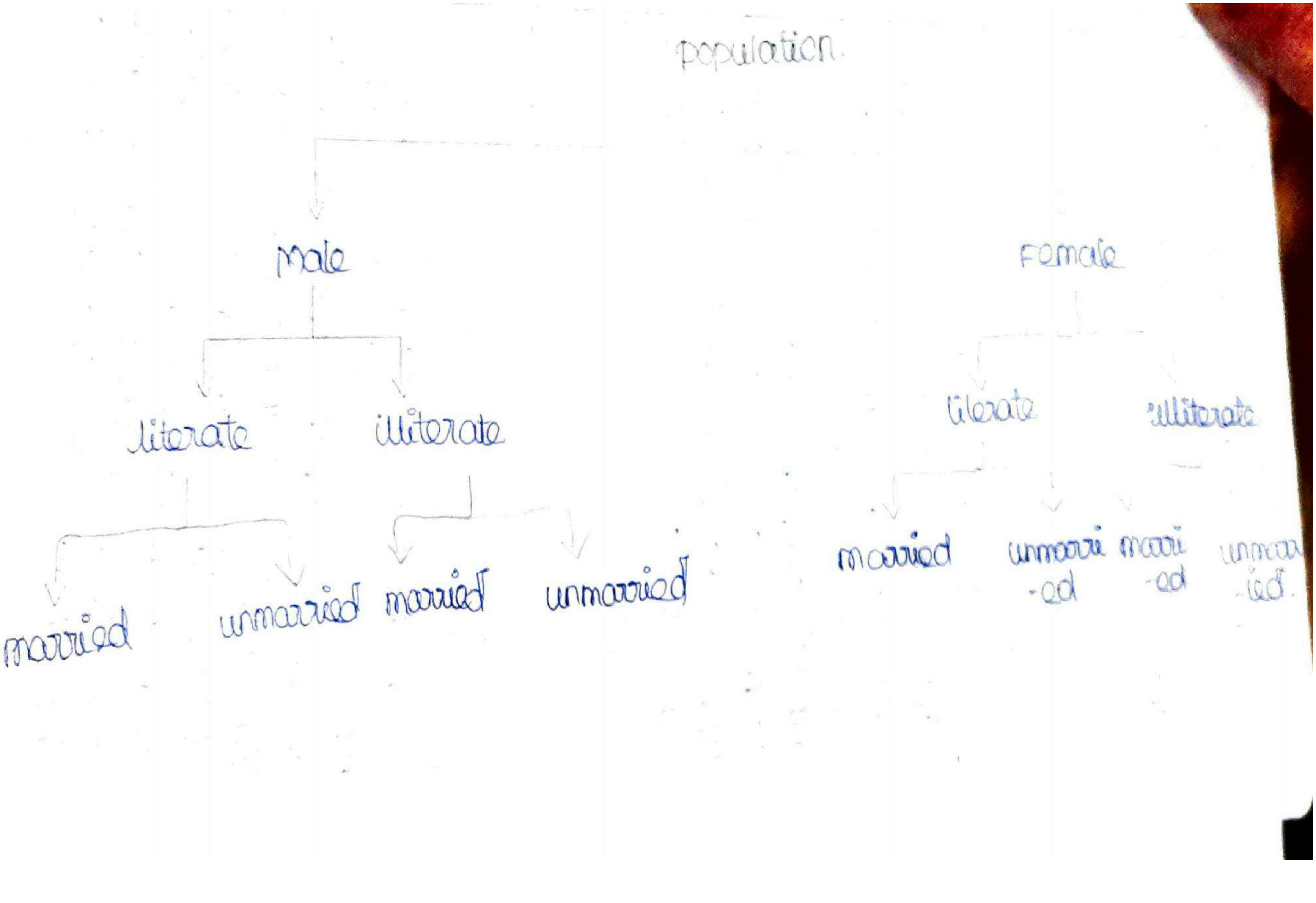
If the data are classified into only two classes, such as literate and illiterate or honest and dishonest or skilled and unskilled, the classification is termed as simple classification. This classification is normally dichoto -my or twofold; for example,





b) manifold classification:-

In manifold classification, the universe is classified on the basis of more than one attribute at a time; for example, we may first divide the population into males and females on the attribute of sex; then further divide them on the basis of literacy and so on:



measurement

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, profits, etc., it is called quantitative classification or classification according to variables. variable is the quantitative phonomenon under study.

Marks	No. of Students.
10-20	10
20-30	7
30-40	13
40-50	18
50-60	12

In the above classification, there are two elements, viz.

(1.) The VARIABLE i.e., the marks in the above example and

(2.) The FREQUENCY i.e., the number of students in each class. There are ten students who scored marks between 10 and 20, seven students scored marks between 20 and 30 and soon.

each variable).

UNIT-2

Tabulation of Data.

meaning:- (2m)

By tabulation we mean, a systematic presentation of numerical data in columns and rows in accordance with some salient features or characteristics. columns are vertical arrangement and rows are horizontal arrangement

Definition:

Prof. Noiswangon, "A statistical table is a systematic organi-sation of data in columns and rows". Tabulation is the process of presenting data in tables.

The main objectives of tabula-tion are :

(i) to classify the object of investigation.

(ii) to simplify complex data.

(iii) to clarify the characteristics of data.

(iv) to present facts in the minimum of space.

(v) to facilitate comparison.

(vi) to detect errors and omission in the data.

(vii) to depict trend and tendencies of the problem under consideration

(viii) to facilitate statistical proces-sing.

(ix) to help reference.

Difference between classification and Tabulation.

(i)

suitable structure.

parts of tabulation

A good statistical table in an art the following parts must be present in all tables;

(i) table number.
(ii) Tittle
(iii) Head note
(iv) caption
(v) Stubs
(vi) Body of the tabb
(vii) Foot note
(viii) Source-note

(1) Table number:

A table should always be numbered for identification and reference in the future. each column should also be numbered as shown in the Illustration.

(2) Tittle of the table:

Each table should always be given a suitable title. It must be written on the top of the table. It must describe the contents of the table. It must explain (1) what the data are (2) where the data are (3) time or period of data (4) how the data are classified, etc.

3) Head note :

It is a statement, given below the title and enclosed in brackets; for example; The unit of measurement is written as a head-note, such as 'in million -s' or 'in crores'.

4) captions :

These are headings for the vertical columns. They must be brief and self-explanatory. They have main heading and sub-headings and be written in small letters.

5) stubs :

These are the headings or designation for the horizontal rows stabs are wider than columns.

(6.) Body of the table :

It contains the numerical information. It is most important part of the table. The arrangement is the body is generally from left to right in rows and from top to bottom in columns.

(7.) Foot-note :

It any explanation or elaboration regarding any item is necessary, foot-notes should be given.

(8.) Source-note :-

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

Rules for tabulation.

General rules :-

1.) The table should be simple and compact. It should not be overloaded with details.

2.) The captions stubs in the tables should be arranged in a systematic manner. It should must be easy to read the important items. There are many types. They are alphabetical, chronological, Geographical, conventional etc.

3.) It should suit the purpose of the investigation..

4.) The unit of measurements should be clearly defined and given in the tables ; For example, height in metres, weights in kilograms, etc,

5.) figures may be rounded off to avoid unnecessary details in the table. But a foot note must be given to this effect.

6.) suitable approximation may be adopted.

7.) miscellaneous column should be added to include unimportant items.

8.) A table should be complete and self-explanatory.

9.) A table should be attractive to draw the attention of readers.

10.) As it forms a basis for statistical analysis, it should be accurate and free from all sorts of errors.

11.) Abbreviations should be avoided

12.) Do not use ditto marks that may be mistaken.

13.) proper lettering will help to adjust the size of the table.

14.) If it is a big table, it will lose its ~~simple~~ simplicity and understand

ability and in such a case break it into two or three tables.

Types of Tables

1) on the basis of coverage;

simple and complex.

In a simple table the data are classified according to only one characteristic. It is termed as one way or single table and it takes form of frequency table. In a complex table two or more characteristics are shown. It is more popular because it helps appropriate consideration of all related facts.

simple table :-

Distribution of marks.

class marks	No. of students.
20-30	10
30-40	18
40-50	22
Total	50

Two-way table :

If the caption or stub is classified into two characteristics and if it gives information of two interrelated questions, then such a table is called-two way table; for example,

Distribution of marks (Girls & boys)

class marks	Number of students		
	Boys	Girls	Total
20-30	6	4	10
30-40	8	10	18
40-50	10	12	22.
Total	24	24	50

Three-way table:

In this type of table Three characteristics are shown. It gives information regarding three interrelated characteristics of a phenomenon for example.

Distribution of population by Age, sex and literacy.

	males			females			Total		
Age group (years)	liter-ate	illiter-ate	Total	liter-ate	illiter-ate	Total	liter-ate	illite-rate	Total
0-18									
18-25									
25-35									
35-45									

A large number of interrelated problems or characteristics are represented in the same table,

for example, the distribution of students in a college according to faculty class, sex and residence.

manifold or higher order table :-

No. of students in M.K. university (according to faculty, age, sex and residence).

Faculty one group (year)	Students						Total			Total
	Boys			Girls						
	Hostella -rs	days chola -rs	Total	Hostella -rs	Days chola -rs	Total	Hostell -ers	days cholers	Total	
Commerce.										
20-25										
25-30										
above 30										
Arts										
20-25										
25-30										
above 30										
Science										
20-25										
25-30										
above 30										
Law										
20-25										
25-30										
above 30										

8.) on the basis of objective (purpose)

General purpose table.

It is also known as informa-tive table and provides information

for general chronologic in the cons Govt agenc tables Th workers placed in bar repo special f It i or text or deriva data rel special f etc.; are (3.) on the Th classified derived : I forms It conta In a da are da It pro average correlat derived practic

for general use; and usually in chronological order. The detailed table in the census reports are of this kind Govt agencies prepare this type of tables. These are used by research workers and staticians. These are placed in the appendix of a report for reference.

special purpose table:

It is also called a summary table or text table or analytical table or derivative table. It presents the data relating to a particular or a special purpose. Ratios, percentages etc., are used to facilitate comparison

(3.) on the basis of originality :-

The statistical table may be classified into (1) primary table (2) derived table.

In primary table, the statistical forms are expressed in original. It contains actual & absolute figures. In a derived table figures and results are derived from the primary data. It presents totals, percentages, ratios, averages, dispersion, co efficient of correlation, etc. Both primary and derived tables are generally used in practice].

Unit-2: Collection of Data.

Definition of primary data and secondary data:

Statistical data may be classified as primary and secondary. primary data are those which are collected for the first time and they are original in character. If an Individual or an office collects the data to study a particular problem, the data are the raw materials of the enquiry. They are primary data collected by the investigator himself to study any particular problem.

secondary data are those which are already collected by some one for some purpose and are available for the present study For instance. The data collected during census operations are primary data to the department of census and the same data, if used by are search worker for some study, are secondary data.

Collection of primary data

For the collection of primary data, investigator may choose

any one of the following methods:

1.) Direct personal observation.
2.) Indirect oral interview
3.) Information through agencies
4.) mailed questionnaires.
5) schedules sent through enumera -tor.

1) Direct personal observation :-

under this method, the data are collected by the investigation personally. The investigator must be a keen observer, tactful and courteous in behaviour. He asks or cross-examines the informant and collects necessary information. The enquiry is intensive, rather than extensive. For instance, if one wants to study the living conditions of the people in a village, he has to go to the village, contact the people and get the needed information. It is original in character.

Merits :- 5 Point

1.) original (first-hand information) data are collected.

2.) True and reliable data can be had.

3.) Response will be more encouraging because of personal approach.

4.) A high degree of accuracy can be aimed.

5.) The investigator can extract correct information.

6.) misinterpretations, if any, on the part of the informant can be maintained.

Demerits:

1.) It is unsuitable where the area is large.

2.) It is expensive and time-consuming

3.) The chances of bias are more.

4.) An untrained investigation will not bring good results.

5.) one has to collect information according to the convenience of the informant.

2.) Indirect oral interview :-
when the informant is reluctant to supply information the method of indirect oral investigation can be followed. under this method the investigator approaches the witnesses or third parties, who are in touch with the informant. The enumerator interviews the people, who are directly or indirectly connected with the problem under study.

Merits :-

1.) It is simple and convenient.
2.) It saves money, time and labour.
3.) It can be used in the investigation of a large area.
4.) The information is unbiased.
5.) Adequate information can be had.
6.) As the information is collected from different parties, a true account can be expected and all aspects of the problem can be ascertained.

Demerits :-

1.) Absence of direct contact is there; the information cannot be relied.

2.) Interview with an improper man will spoil the results.

3.) In order to get the real position, a sufficient number of persons are to be interviewed.

4.) The careless attitude of the informant will affect the degree of accuracy.

5.) witnesses may colour the informa-tion according to their interests.

3.) Information through agencies :-

Under this method, local agents or correspondents will be appointed. They collect the information and transmit it to the office or person. They do this according to their own ways and tastes. This system is adopted by news papers, periodicals, agencies, etc,..

Merits :-

1.) Extensive information can be had.

2.) It is the most cheap and economical method.

3) speady information is possible.
4.) It is useful where information is needed regularly.

Demerits :-

1.) The information may be biased.
2.) Degree of accuracy cannot be maintained.
3) uniformity cannot be maintained.
4.) Data may not be original.

4) Mailed questionnaires :-

In this method, a questionnaire consisting of a list of questions pertaining to the enquiry is prepared, There are blank spaces for answers. This questionnaire is sent to the responderts, who are expected to write the answers in the blank spaces. A covering letter is also sent along with the questionnaire, requesting the respondents to extend their full co-operation by giving the correct replies and returning the questionnaire duly filled in time.

Merits :-

1.) Of all the methods, the mailed questionnaire method is the most economical.

2.) It can be widely used, when the area of investigation is large.

3.) It saves money, labour and time

4.) Error in the investigation is very small, because information is obtained directly from the respondents.

Demerits :-

1.) In this method, there is no direct contact between the investigator and the respondent. Therefore we cannot be sure about the accuracy and reliability of the data.

2.) This method is suitable only for literate people. In many countries, there are illiterate people who cannot understand and reply the questionnaire.

3.) There is long delay in receiving questionnaires duly filled in.

4.) people may not give the correct answer and thus one is led to false conclusion.

5.) The questionnaire is inelastic Asking supplymentary question is not possible.

6.) sometimes the informants may not be willing to give written answers, apart from causing delay.

5.) schedules sent through enumera -tors :-

It is the most widely used method of collection of primary data. A number of enumerators are selected and trained. கதன் தொடர்ச்சி last page-ல் உள்ளது.

Merits :-

1.) This method is very useful in extensive enquiries.

2.) It yields reliable and accurate results, because the enumerators are educated and trained.

3.) The scope of the enquiry can also be greatly enlarged.

4.) Even if the respondants are illiterate, this technique can be widely used.

5.) As the enumerators personally obtain the information, there is less chance of non-response.

Demerits :-

1.) This is a very costly method as the enumerators are trained and paid for..

2.) This method is time-consuming because the enumerators go personally to obtain the information.

3.) personal bias of the enumerators may lead to false conclusion.

4.) The quality of the collected data depends upon the personal qualities of the enumerator.

5.) It is not suited to all persons due to its costliness

secondary data

sources of secondary data :-

The various sources of secondary data can be devided into two broad categories:-

1.) published sources.

2.) unpublished sources.

1.) published sources :-

various governmental, inter -national and local agencies publish statistical data, and chief among them are.

(1) International publications :-

International agencies and International bodies publish regular and occasional reports on economic and statistical matters. They are I.M.F., and I.B.R.D the I.C.A.F.E and U.N.O., etc.,

b) official publications of central and state Governments :-

Departments of the union and state governments regularly publish reports on a number of subjects. They gather additional information. some of the important publications are; The RESERVE BANK of india Bulletin, census of india, statistical Abstracts of states, Agricultural statistics of india, Indian trade ~~journal~~ journal, etc,...

c) semi official publications :-

semi-Government institutions, like municipal corporation, District Board, panchayat, etc,.. publish reports.

d) publications of Research institutions :

indian statistical institution (I.S.I), Indian council of Agricul-tural research (I.C.A.R) indian

Agricultural statistics research institute (I.A.S.R.I) etc.,

Publish the findings of their research programmes.

e) Publications of commercial and Financial Institutions:

F) Reports of various committees and commissions appointed by the government:

For example, wanchoo commission Report on Taxation, pay commission Reports on, land Reforms committee Reports, etc., are sources of secondary data.

g) Journals and Newspapers:

current and important materials on statistics and socio-economic problems can be obtained from journals and newspapers like, economic times, commerce, capital, Indian Finance, monthly statistics of trade, etc..

2) unpublished sources:

There are various sources of unpublished data. There are the records maintained by various government and private offices,

the researches carried out by individual research scholars in the universites or research institutes.