

Q. Define the Scope of statistic and point out its limitations.

Ans - The words statistic is generally used to represent two things -

1. Numerical statements of facts
2. The methods used to analyse and interpret the data. When this word used in singular it represent the method as say science or art of analysing the data.

According to Prof. Tippet - "To the man in the street statistics are just figure and he is inclined to think of a statistician as being primarily one who counts the No. of things."

According to Bowley, "Statistics are numerical statements of facts in any department of inquiry placed in relation to each other."

According to the definition only numerical facts and specially those facts which relate two states are statistic i.e. data. Statistical methods like Social Science, physical and Natural Science is modern time of data.

Scope of Statistics

The scopes of statistics can be divided into the following divisions -

1. Statistical method :- Statistical methods are considered a common kit of tools for describing and analysing data for various disciplines. In other words, statistical methods are the processes used in collection, organization, summary, analysis, interpretation and presentation of data.

The important statistical methods are as below.

1. Collection of data
2. Classification " "
3. Tabulation " "
4. Presentation " "
5. Analysis " "
6. Interpretation " "
7. Forecasting " "

2. Applied statistics :- The applied statistics consists of application of statistical methods and techniques to the problems and facts as they exist. Quality control, sample survey,

Quantity analysis for business decision are included in the decision.

Limitation of Statistics :-

Statistics is an important tool of quantity analysis and research and social science, physical and life sciences. It suffers from shorter limitation which restricts its scope. The following are main limitation of statistics -

1. Statistics deals only with quantity aspects of problems :- Science statistics deals only with these facts which are numerically expressed. Therefore we cannot employ techniques of statistical inquiry to investigate to problem of quality nature. For instance, qualitative characteristics like honesty, intelligence, smartness, blindness and deafness, managements efficiency can not be study directly.

2. Statistics does not deal with individual measurements :- Statistics deal only with aggregate of facts. The statistical techniques are appropriate.

only for the study of group characteristics

3. Statistical results are true only on average. — Prof. A. L. Bowley has rightly said that statistics is the science of average. It emphasised that statistical results are true only on average.

Hence statistical results suffer from all such limitations with which the concept of average suffers.

4. Statistics can be misused :- The misuse of statistics may arise due to several reasons. For example if the statistical conclusions are drawn on incomplete information, one may arrive at fallacious conclusions. In the hands of inexperienced people limits the

Conclusion :- Statistics requires to exercise skill to draw conclusion from the data. Every likely hood wrong enterprise. The very fact that it may lead to fallacious conclusions in the hands of inexperienced people limits the

possibility or mass popularity of such a useful science. Also statistics cannot be used to full advantage in the absence of proper understanding of the subject to which it is applied.

Q: What do you know by a questionnaire? What are characters of good questionnaire?

Ans:- A questionnaire consists of a list of questions directly or indirectly connected with the work of the investigation and contains (or does not contain) blank space for writing the answers, but answers are written on another paper is called a questionnaire.

A list of questions that is sent to the person concerned the answers questions and returned by him is called a questionnaire.

* Good questionnaire :- A good questionnaire is one which help directly achieve the research objectives, provides complete and accurate information, is easy for both interviewers and respondents to complete, is so designed as to make sound analysis and interpretation possible and is brief.
questionnaire is a list of questions

pertaining to a particular enquiry in hand the framing of questions and overall drafting of a questionnaire have strong bearing upon the quality of the questionnaire. Preparing a questionnaire is a technical job and requires a great deal of skill, expertise and practice.

The following general principles should be followed while designing or drafting the questionnaire.

- a. Covering letter :- The person conducting the survey must introduce himself and also state the objectives of the investigation. The covering letter should state in a few words as possible the purpose of survey.
- b. Number of questions should be small :- The number of questions to be included in a questionnaire depends upon the object and scope of enquiry.
- c. Questions should be simple and short :- questions should be very simple and as clear as possible. Questions of uncertain nature should be avoided.

d. Questions should be logically arranged :- The questions must be arranged logically so that a natural and spontaneous reply to each is induced. They should not skip back and forth one topic to another.

e. Cross-check :- If possible, one or more cross-check should be incorporated into the questionnaire to determine whether the respondent answering at least the important questions correctly.

f. Pre-testing the questionnaire :- Once the draft questionnaire is ready, it should be put to test on a selected number of informants enumerators.

g. Questionnaire should be look attractive :- A questionnaire should be made to look as attractive as possible. The printing and the paper used.

h. Method of tabulation :- The method to be used for tabulation the results should be determined before the final draft of the questionnaire is made. If the results of the questionnaire are to be computerized.

i. Open questions :- These are questions which is expected to be answered by the informant in his own words. The aim of such questions is to seek the personal opinion of the informants on certain matters.

i. Question requiring calculations should be avoided.

J. Personal and sensitive questions should be avoided.

k. Questions should be framed with alternative answers.

These are the main provisions of drafting and essential of good questionnaire or qualities of a good questionnaire.

Characteristics of good questionnaire :-

Questionnaire are a common and expensive research tool used by private companies, government departments, individuals, groups, etc to get feedback, research, collect data from consumers, customers or from

general public depending on the need,
These are several characteristics of
good questionnaire: -

i. Need to know what need to be measured: - Having a clear picture and understanding of what data needs to be collected contributes to the quality of data collection.

ii. Should know how to word/frame questionⁿ and words should be neutral and should not be leading: - Whatever your opinion may be reflected in the questions. This is done both intentionally and unintentionally but should be taken care of.

iii. Emphasis on right word/phrase should be kept in mind: -

The language should be clear so that the required data can be received. This also makes the question and the requirement of survey to understand and this help in getting a better response and answer.

iv. Define and quality terms: - This is most essential when a technical survey or a field specific survey is being done. If you think that the audience being surveyed might not know about some terms then they must be defined to get any proper response.

v. multiple questions in question should be avoided: - One questions should be have one answer. If more than one question needs to be asked then it should be made a separate question to improve clarity of questions.

vi. Word rearing emphasis should be emphasize. It helps in making a point and question clear.

vii. options like good / Bad / Fair / average should be quantified through photographs or other mean -

These are very vague terms and interpretations of these varies from person to person.

viii. Unwanted assumptions should be avoided :-
A Survey is about getting factual data and assumptions should be avoided.

3. What are the merits and demerits of a random Survey and a Complete Census?

Ans: - Random Survey / Sampling :- Random Sampling is the Scientific technique of drawing samples from the population according to some laws of chance (i.e. Probability) in which each unit in the population has some definite pre-assigned probability of being selected in the sample.

Actually, randomness is a property of the sampling procedure and not the sample itself. Random Sampling is also called probability sampling.

Merits :-

1. Scientific Technique :- It provides a Scientific technique of selecting the sample from a universe in which each unit of the universe has the equal chance of being included in the sample.

2. Less chance of Bias :- There is little chance of bias and prejudices of investigator

to play and influence the selection of the sample.

3. Evaluation of Relative Efficiency :- It is a possible the relative efficiency of various sample designs when conclusion under the method.

4. Less dependence on detailed information :- It does not depends very much upon the existence of detailed information about the universe for its effectiveness.

5. Sampling Error :- If random sampling method is used, we can calculate the sampling error and can be sure about the limits under which the inferences are dependable.

6. Probability :- Random sampling is practically based on the theory of probability.

Demerits :-

1. Complete List :- This method requires complete list of units of the universe and in many cases it is not possible or practicable.

2. Costly :- In case of field surveys sometimes the sample units selected tend to be too widely scattered geographically that it needs more cost, time and labour to cover the whole field of enquiry.

3. Independence :- All the units in the population must be independent if this method is to be used.

4. Size of population :- If the scope and size of population is small, the selection of representative sample is not possible.

5. Heterogeneous :- If the universe has units diverse characteristics this method can't select a representative sample.

Census method :- Census method is the method of statistical enumeration where all members of the population are studied. A population refers to the set of all observations under concern. For example, if you want to carry out a survey to find out students' feedback about the facilities in your school, all the students of your school would form a part of the population for your study.

At a more realistic level, a country wants to maintain information and records about all household. It can collect this information by surveying all households in the country using the census method.

In our country the government contacts the Census of India every ten years. The census ~~oppor~~ ^{appropria} information from household regarding their incomes, the earning members, the total number of children, members of the family etc.

The main provision of sampling and census method in statistics for data collection.

* Difference between Census and Sample Survey

Parameter	Census	Sample Survey
Definition	A statistical method that studies all the units as members of a population	A statistical method that studies only a representative group of the population and not all its members.
Calculation	Total / Complete	Partial
Time involved	It is a time-consuming process	It is a quicker process
Cost involved	It is a costly involved	It is a relatively in expensive method

Accuracy	The results obtained are accurate as each is surveyed. So there is a negligible error.	The results are relatively accurate due to leaving out of items from the sample. The resulting error is large. Low reliability.
Reliability	Highly reliable	Low reliable
Error	Not Present	The smaller the sample size.
Reference	This method is suited for heterogeneous data.	This smaller method is suited for homogeneous data.