BUSINESS STATISTICS AND MATHEMATICS

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PREFACE

This text Book of "Business Statistics and Mathematics" is specially prepared for B.Com & B.B.A students. It is prepared according to the syllabus given in this book.

The entire syllabus has been divided in to four Modules. It includes three chapters from statistics to bring out clearly the importance of statistics in solving different business and research problems and one chapter from Mathematics to encourage and enable students to develop the knowledge, skills and attitudes necessary to survive in the competitive environment. All chapters are explained through illustrations to reach the level of students.

I do not claim any originality in the subject matter of this Book. I have drawn immense material from many standard books and problems solved from the previous year's question papers. I would like to express my special thanks of gratitude to Edwsise Publishers, Mangalore who gave me the golden opportunity to bring out this text book and take the responsibility of publishing it.

I thank my family and colleagues for giving me encouragement and support in bring out this text book.

Suggestions for improvement of this text book will be greatly accepted

Belthangady   **Dr. Chandravathi**

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SYLLABUS
BUSINESS STATISTICS & MATHEMATICS

Objective:

To acquaint the students with the basic knowledge of Business Statistics and business mathematics to analyze business and managerial data and facilitate managerial decision- making.

Module I   **12 hrs**

Introduction to statistics- Definitions - primary data- methods of collection, secondary data and sources-Classification-Types-Tabulation-Blank tables. **Measures of central tendency**- Mean, Median, Mode, Geometric Mean and Harmonic Mean

Module II   **12 hrs**

Measures of dispersion- Range, Mean deviation and Standard deviation- their relative measures (coefficients). Time series-components- measuring trend by the method of moving average and method of least squares.

Module III   **12 hrs**

Correlation &Regression **analysis**- Meaning and types- Karl Pearson's Correlation Coefficient and Spearman's Rank correlation coefficient (with and without ties) -Regression analysis- Meaning- regression equations - estimation using regression equations.

Module IV   **12 hrs**

Ratio- Proportion - Direct proportion- inverse proportion; Simple interest- True discount, Bankers discount and Bankers gain, equated due date; Trade discount- cash discount.

Compound interest- Formula for compound interest- interest payable half yearly or quarterly- interest for fraction of a period; Annuities-Amount of an immediate annuity and annuity due, present value of annuity immediate and annuity due present values of perpetuity due and perpetuity immediate.

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CONTENTS

Introduction to statistics- Definition-Primary data- methods of collection-secondary data & sources- classification-types- Tabulation-Blank table, Measures of central tendency-mean, median, mode, geometric mean and harmonic mean.

Introduction:

Statistics is an introduction of statistical methods and fundamental concepts to draw conclusion about the data. It is a discipline like accounting, management, taxation, cost accounting, etc. But in Statistics discipline number plays an important role. If we express any statement through numbers, it becomes a statistical statement. If there is no number in the statement, it is not clear and meaningful. Statistics is a branch of mathematics used to summarize, analyze and interpret the collection of data. For example all businessmen, industrialists, economists, researchers make use of statistics to do their job.

Meaning of Statistics:

Facts and figures relating to any matter, whether it is relating to marks of the student, height, weight, income, population or any other matter are called as statistics. For example 2,500 students took the Business Statistics Examination at Mangalore University during 2018, out of which 2313 students passed and 187 students failed. This is a statistical statement.

Definition of Statistics:

Some Authors defined Statistics in the plural sense ie Statistics as Statistical data whereas others in singular sense ie Statistics as Statistical methods

In singular sense:

Croxton and Cowden defined Statistics "as the Collection, Classification, Analysis and Presentation of numerical data"

In plural sense:

According to Horace Secrist, "Statistics are aggregates of facts affected to a marked extent by multiplicity of causes, numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected in a systematic manner for a predetermined purpose and placed in relation to each other"

This definition explains the characteristics of Statistics.

1. Statistics are aggregates of facts. Single fact cannot be considered under Statistics because it cannot be comparable.
2. Statistics are affected by multiplicity of causes
3. Statistics are expressed in numbers
4. Statistics are enumerated or estimated according to reasonable standards of accuracy
5. Statistics are collected by preparing the advanced plan
6. Statistics are collected for well in advance purpose
7. Statistics should be comparable with one another

Functions of statistics:

1. One of the important functions of statistics is to present general statements in a precise and definite form.
2. It helps in condensing the mass of data
3. It helps in comparison of same kind of data with one another
4. Statistical methods are helpful in formulating and testing hypothesis
5. Statistical methods are helpful in forecasting the future events

6. It is very much useful in formulation of policies and plans

7. It simplifies the complexity of the data

8. It helps in knowing the future trends

Limitations of Statistics:

1. Statistics does not deal with individual facts, but only with aggregates

2. Statistics deal with only quantitative characteristics

3. The conclusions drawn on the basis of statistical data are not always reliable

4. Statistics is only a method of studying problem do not provide best solution in all the situations

5. If statistical conclusions are based on incomplete information, it is liable to be misused

Primary data and secondary data:

Information which is directly collected from the field is called primary data, which are original in nature. It is first hand information.   Secondary data is not original but obtained from published or unpublished sources. It is second hand information.

Methods of collection of primary data:

1. Direct personal interview:

2. Indirect personal interview

3. Information from correspondents

4. Mailed questionnaire method

5. Schedule sent through enumerators

1. Direct personal interview:

Under this method the investigator personally contact the respondents and ask them questions relating to survey and collects the desired information. For example if a person wants to collect data about the job satisfaction of workers of Vinayaka

cashew factory he would go to the factory and make face to face interview and collect the desired information

2.   *Indirect personal interview:*

In this method the investigator meets the third person who knows about the respondents instead of meeting him personally. This method is adopted only when the informants are not ready to give the information. For example enquiry about smokers, drunkards, drug edict etc.

3. *Information from correspondents*:

Under this method investigator appoints local agents or correspondents in different places to collect information. These agents collect the information and send it to the investigator who processes it. For example the reporters of the newspapers followed this method.

4. *Mailed questionnaire method*:

In this method a list of questions pertaining to the survey is prepared and sent to the various informants by post. The questionnaire contains questions, space for answers and covering letter requesting them to fill the questions and sent it back within a specified time. This method is less time consuming and it can be followed only if the respondents are literate.

5. *Schedule sent through enumerators;*

It is another method of collecting information. Under this method the interviewer contact the respondents with schedules which contains the questions relating to survey and get replies from the respondents and fill it in the appropriate question column.

Sources of secondary data:

Secondary data can be collected from a number of sources which can be broadly classified in to two types

a. Published sources