

# SYLLABUS

## PANJAB UNIVERSITY

BCA (1<sup>ST</sup> YEAR) 1<sup>ST</sup> SEMESTER

### Fundamentals of Mathematical Statistics

BCA-16-12

L T P Cr

6 1 - 3

Time Duration: 3 Hrs.

External Marks: 65

Internal Marks: 10

Number of Lectures : 60

**OBJECTIVE :** To teach the students the basic techniques of Numerical & Statistical Methods. After completing this course students will be able to solve various Financial, Scientific and Engineering fields' problems.

**Note :**

- (i) The Questions Paper will consist of Four Sections.
- (ii) Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- (iii) The students are required to attempt **ONE** question from each Section and the Compulsory question.
- (iv) All questions carry equal marks unless specified.
- (v) **The student can use only Non-programmable & Non-storage type of Calculator.**
- (vi) **Log tables are allowed. Students may be provided the same for computation.**

#### SECTION – A

**Basic Statistics:** Types of Statistics, Different Statistical Techniques, Steps in Statistical Investigation, Uses and Limitations of statistics, Collection of Data: Sources of collecting primary and Secondary Data, Limitations of Secondary Data, Criteria of evaluating secondary data, Organization of data, Graphs of Grouped Frequency Distribution, Tabulation of Data, Parts of Table

**Measures of Central Tendency:** Kinds of measures of central tendency (statistical averages or averages):

**Arithmetic Mean:** Simple Arithmetic Mean, Methods of calculating Simple Arithmetic Mean, Arithmetic Mean in case of Individual Series, Discrete series and continuous series, Weighted Arithmetic Mean, Combined Arithmetic Mean.

**Geometric Mean:** Simple Geometric Mean, Methods of calculating Simple Geometric Mean, Geometric Mean in case of Individual Series, Discrete series and continuous series, Weighted Geometric Mean, Combined Geometric Mean.

**Harmonic Mean:** Simple Harmonic Mean, Methods of calculating Simple Harmonic Mean, Harmonic Mean in case of Individual, Discrete series and continuous series, Weighed Harmonic Mean, Combined Harmonic Mean.

## SECTION – B

**Median:** Methods of Calculating Median in case of Individual, Discrete series and continuous series.

**Partition Value:** Quartile, Quintiles, Hexiles, Septiles, Octiles, Deciles, Percentiles.

**Mode:** Methods of Calculating Mode in case of Individual Series, Discrete series and continuous series

**Range:** Computation of Range, Inter Quartile Range, Computation of Inter Quartile Range, Percentile Range and Computation of Percentile Range.

Mean Deviation, Computation of Mean Deviation, Standard Deviation, Calculation of Standard Deviation, Variance, Calculation of Standard Deviation for individual Series, Discrete Series and Continuous Series, Coefficient of Standard Deviation and coefficient of variation, Combined Standard Deviation, Correcting incorrect Standard Deviation

## SECTION – C

**Correlation Analysis :** Correlation Analysis: Definition, Types of Correlation: Positive, Negative Simple, Multiple, Partial, Total, Linear and Non-Linear. Need of Correlation Analysis, Correlation and Causation, Techniques for Measuring Correlation: Scatter Diagram Method, Graphic Method, Karl Person's Coefficient of Correlation: Correcting incorrect coefficient of correlation, calculating Karl Person's coefficient of correlation in case of grouped series, Probable Error, Coefficient of Determination, Spearman's coefficient of Correlation (Rank correlation): Calculation of Correct Coefficient of rank correlation, Difference between Rank Coefficient and Karl Pearson's coefficient of coefficient, Coefficient of concurrent deviation.

## SECTION - D

**Regression Analysis (Linear Regression):** Definition, Difference between Correlation and Regression, Types of Regression Analysis: Simple, Multiple, Partial, Total, Linear and Non-Linear, Objectives of Regression Analysis, Methods of obtaining regression analysis : Regression Lines, Regression Equations. Methods of obtaining regression equations: Normal Equations and Regression Coefficient, Properties of Regression Coefficient, Standard Error of Estimate, Regression Coefficient in case of Grouped Data, Uses of Regression Analysis and Limitations of Regression Analysis.