

## **Business Mathematics and Statistics**

B.Com (Annual) Part-I Paper-II

Maximum Marks: 100 (Pass Marks: 40)

Duration of Examination: 3 Hours

### **Course objectives:**

Upon completion of this course, students are expected to be able to:

1. Develop an understanding of the selected Mathematical and Statistical concepts as well as their application in the situations encountered in business and commerce and to develop competency in fundamental arithmetic through practical applications.
2. Get background of Statistical Methods required for other courses in business, economics and commerce.
3. Obtain basic skills in using Statistical Computer Packages to assist in performing necessary computations required in statistical analysis through practical applications.

### **Mathematics**

**Equations, Inequalities and System of Simultaneous equations:** Solution of First and Second degree equations in One Variable.

Inequalities in one variable and their solution. Introduction to the System of Simultaneous Equations and its Practical Applications. Solution of the System of Simultaneous Equations.

**Sequence, Series and Progression:** Introduction and Comparison thereof. Arithmetic Series and its application in business. Geometric Series and its application in business

**Matrix Algebra:** Introduction. Types of Matrices (Symmetric, Identity, Square). Use of Matrices. Basic Arithmetic of Matrices: Addition, Subtraction, Multiplication. Determinant, Adjoint and Inverse of matrix. Solution of linear equations through matrices.

**Differentiation:** Introduction to Differential calculus and differentiation of functions. Partial Differentiation, First and Second Derivatives. Application of derivatives in Business and Commerce. Optimization.

**Mathematics of Finance:** Interest and its computation. Annuities and their future value. Annuities and their present value. Application of interest in Business and Commerce.

### **Statistics**

**Introduction:** Definition and meaning of Statistics. Types of Statistics. Application in Business and Commerce.

**Data Summarization:** Data collection. Source of statistical data. Application of Computer in summarizing data. Frequency Distribution. Graphical representation of data (manual and computer based)

**Measures of Central Tendency:** Idea of Average and Types of Averages. Need and use of Median, Quartile, Decile, Percentile, Mode, and Geometric Mean in business situations. Empirical relation between Mean, Median and Mode. Computer Based calculation of these averages.

**Measures of Dispersion:** Definition and meaning of Dispersion. The Range, Quartile Deviation, Mean Deviation, Variance, Standard deviation and their application and interpretation. Properties of Variance and Standard Deviation. Coefficient of Variation: Need and Uses. Symmetric and Non-symmetric distributions. Computer based calculation of Measures Dispersion.

**Index Number:** Definition and its types (Price and Quantity index, Weighted and unweighted Aggregate index) with their application

**Simple Regression and Simple Correlation:** Types of relationship, Scatter diagram to assess the direction and strength of relationship. Fitting of regression lines. Prediction. Standard Error of Estimate. The concept of Correlation and Correlation Coefficient.

**Basic Probability Theory:** Random Experiment. Event and its types. Definitions of Probability. Rules of counting. Addition and Multiplication laws of Probability. Application of Probability Theory in Business situations.

**Random variable and Probability Distributions:** Introduction to Random Variable and its types. Probability Distributions and their types. Types of Probability Distribution. Discrete Probability Distributions. Continuous Probability Distributions. Distribution Functions. Expected values of random variable, Variance of random variables.

### **Recommended Books:**

1. Levin, R. I. and Rubin, D. S., (1997), "Statistics for Management", 7<sup>th</sup> Edition, Prentice Hall
2. Sandra Quinn, Kathleen Bowser and Elizabeth Flaherty (1993) "Budnick's Applied Mathematics for Business, Economics and Social Sciences", 4<sup>th</sup> Edition, McGraw Hill.

### **Further Readings**

1. Bowen, E.K. and Starr, M.K. (1982), "Basic Statistics for Business and Economics", McGraw-Hill Education
2. McClave, J. and Benson, P.G. (2010), "Statistics for Business and Economics", 11<sup>th</sup> Edition. Prentice Hall.
3. Stanley J. Farlow and Gary M. Haggard (1988), "Applied Mathematics for Management, Life Sciences and Social Sciences", Random House Inc.
4. Swift, L., (1997), "Mathematics and Statistics for Business, Management and Finance", Palgrave Macmillan
5. Anderson, D.R., Sweeney, D.J., and Williams, T.A., (2010) "Statistics for Business and Economics", 11<sup>th</sup> Edition South-

Western College Publications

6. Webster, A.L. (1997), "Applied Statistics for Business and Economics" 3<sup>rd</sup> Edition. Mac Graw Hill