B.Com.-I (Semester- I)

Syllabus

Business Mathematics-I

Course Objective:

This course aims to equip B. Com students with essential mathematical techniques for solving business-related financial problems, including interest calculations, time value of money, annuities, linear programming problems, and matrix applications. The objective is to develop the ability to apply these concepts to real-world business and economic issues.

Unit 1: Mathematics of Finance, Matrices and Determinants

1. **Mathematics of Finance:**

    Interest Concepts: Principal, Rate of Interest, Nominal, Effective, and Continuous Interest, Interrelationships between Nominal, Effective, and Continuous Interest Rates, Period and Maturity Value, Simple Interest, Compound Interest, Present Value, Time Value of Money, Compounding and Discounting, Annuity, Types of Annuities: Immediate Annuity, Annuity Due, and Perpetuity, Present Value of Annuity Equated Monthly Installments (EMI), Simple problems on immediate Annuity and annuity due with $n \leq 4$.

2. **Matrices and Determinants:**

    Definition of second & Third order Determinant, calculation of values of determinants up to third order, Solution of system of linear equations by Cramer's rule, Properties of determinants (without proof). Simple examples. Definition of a Matrix, Algebra of matrices, Equality of Matrices, Transpose of matrix, Adjoint of matrix, Inverse of matrix (by Adjoint method), Solution of a system of linear equations having unique solution and involving not more than three variables (by Adjoint Method). Special types of matrices, Applications of matrices to business and economic problem.

Unit 2: Linear Programming, and Progressions

1. **Linear Programming Problems (L.P.P.):**

Mathematical Formulation, Graphical Method, Practical commercial examples. Types of Solutions: No solution, multiple solutions, and unbounded solution in L.P.P.

2. **Ratio, Proportion, Logarithms, and Progressions:**

Ratio and Proportion: Solving problems using the rule of three and rule of five. Progressions: Arithmetic Progression (A.P.): Definition, finding the nth term (Tn) and sum (Sn). Geometric Progression (G.P.): Definition, finding the nth term (Tn) and sum (Sn). Commercial Applications: Solving practical business problems using A.P. and G.P.

Reference books:

- Mathematics for Business Studies-J.K.Thukral, Mayur Publications
- Business Mathematics, J.K.Singh Himalaya Publishing House.
- Business Mathematics-Veena G.R. (Newage international Publishers, New Delhi).
- Essence of Business Mathematics–R.K. Rajput, Discovery Publication House, New Delhi
- Business Mathematics-Kapoor V.K, Sancheti D.C.
- Business Mathematics -Dr. Amarnath Dikshit & Dr. Jinendra Kumar Jain.
- Business Mathematics -V.K. Kapoor (Sultanchand & sons, Delhi.)
- Business Mathematics-Bari (New Literature publishing company, Mumbai.)
- Commercial Arithmetic-P.S. Chiplunkar and C.G. Kulkarni
- Mathematics in Commerce and Economics -Qazi Zameerudding and V.K.Khanna
- Mathematics for Business and Social Sciences. Mizrahi and John Sullivan. Wiley and Sons.
- Business Mathematics and Statistics, N. D. Vohra, McGraw Hill Education (India)Pvt Ltd.
- Elements of Calculus-Bhagvatand Pawate
- Business Mathematics–G.V.Kumbhojkar

B.Com.-I (Semester- II)

Syllabus

Business Mathematics-II

Course Objective:

This course aims to introduce B. Com students to essential concepts in Business Mathematics, such as Functions, Limits, Differentiation, Integration, and Continuity. The focus will be on how these concepts are applied in business and economics, helping students solve practical problems related to cost, revenue, profit, and optimization.

Unit 1: Functions, Limits

1. **Functions:**

   Basic Concepts: Constant, variable, and interval, Definition of a Function: Understanding different types of functions and their relevance in business, Illustrative Examples: Examples of various types of functions and their evaluation, Business Functions: Cost function, demand function, revenue function, profit function, and break-even point. Standard Functions: Even, odd, linear, quadratic, exponential, logarithmic, inverse, explicit, implicit, parametric, composite functions. Increasing and Decreasing Functions. Graph of a Function.

2. **Limits:**

   Concept of Limit, Limit Theorems: Basic theorems on limits (without proof) for evaluating limits. Simple examples on types of Limits: Direct type, Factorization, Simplification, Rationalization, Infinity Type, Exponential Type, Numerical examples.

Unit 2: Differentiation and Integration in Business

1. **Differentiation:**

   Definition and Derivative, Derivatives of Special Functions: Algebraic, exponential, logarithmic, inverse, parametric, and implicit functions.

   Applications of Differentiation: Marginal Analysis: Finding marginal cost, marginal revenue, and marginal profit, Optimization: Using differentiation to find the maximum or minimum of business functions

(e.g., profit maximization, cost minimization), Elasticity of Demand, Rate of Change. Numerical examples.

2. **Integration:**

   Definition of Integration, Techniques of Integration: Indefinite Integrals, Definite Integral, Integration by Substitution, Applications of Integration: Total Revenue, Total Cost, Total Profit, Consumer and Producer Surplus, Financial Applications: Present and future values, annuities, and continuous growth models. Numerical examples.

Reference books:

- Mathematics for Business Studies-J.K.Thukral, MayurPublications
- Business Mathematics, J.K.Singh Himalaya Publishing House.
- Business Mathematics-Veena G.R. (Newage international Publishers, New Delhi).
- Essence of Business Mathematics–R.K. Rajput, Discovery Publication House, New Delhi
- Business Mathematics-KapoorV.K, Sancheti D.C.
- Business Mathematics -Dr.Amarnath Dikshit & Dr.Jinendra Kumar Jain.
- Business Mathematics -V. K. Kapoor (Sultanchand & sons, Delhi)
- Business Mathematics-Bari (New Literature publishing company, Mumbai.)
- Commercial Arithmetic-P.S.Chiplunkar and C.G.Kulkarni
- Mathematics in Commerce and Economics -Qazi Zameerudding and V.K.Khanna
- Mathematics for Business and Social Sciences. Mizrahi and John Sullivan.Wiley and Sons.
- Business Mathematics and Statistics, N. D. Vohra, McGraw Hill Education (India)Pvt Ltd.
- Elements of Calculus-Bhagvatand Pawate
- Business Mathematics–G.V.Kumbhojkar