

B.COM  
SEMESTER I  
MATHEMATICAL TECHNIQUES I  
100 Marks- 75 Lectures

Objectives:

- To provide basic knowledge of mathematics and its applications.
- To introduce mathematics, so that they can be used in the field of commerce and industry.
- To acquaint the students with wide ranging applications of mathematical techniques to commerce, economics and practical situations.

I . MATHEMATICAL LOGIC : (10 MARKS - 7 LECTURES)

- Logical statement and Truth tables
- Concept of Negation
- Compound statement
- Conditional and Bi-conditional statements
- Tautology and Contradiction
- Validity of argument (for three statements only by using truth tables)

II . ELEMENTS OF SET THEORY: (10 MARKS - 8 LECTURES)

- Quadratic Equation, Solution of general quadratic equation  $ax^2+bx+c=0$  (statement only)
- Sets: Definition, representation of sets-Roster method and Rule method
- Types of Sets : Finite and infinite sets, null set, singleton set, examples.
- Subset, Union, Intersection, Complement and Difference of Sets, Power sets
- Venn Diagram.
- De Morgan' Laws, Verification by examples and Venn Diagram
- Number of elements in a set, results involving number of elements (up to three sets) and problems based on these results.

III. PERMUTATIONS AND COMBINATIONS: (20 MARKS - 15 LECTURES)

- ◆ Permutations
- Fundamental Principle (statement only)
- Factorial notation,
- Definition of permutation
- Number of permutations of n different things taken r at a time
- Permutations with repetition.
- ◆ Combinations
- Definition of Combination
- Number of combinations of n things taken r at a time ( no proof for results)



IV. COMMERCIAL MATHEMATICS: (20MARKS - 15 LECTURES)

- Ratio
- Proportion
- Percentages
- Discount.

V. PROGRESSIONS: (20 MARKS-15 LECTURES)

- ◆ Arithmetic Progressions
- Definition of an A.P
- Formula for the  $n$ th term of an A.P
- A.P with finite number of terms
- Sum of  $n$  terms of AP
- Application of the results to life problems
- ◆ Geometric Progression(G.P)
- Formula for the  $n$ th term of an G.P, G.P with finite number of terms
- Sum of  $n$  terms of G.P
- Application of the results to life problems.

VI. DETERMINANTS AND MATRICES: (20MARKS-15 LECTURES)

- ◆ Determinants
- Meaning, Order and Determinants of Order 3
- Expansion of Determinates of Order 2 and 3, Value
- Solution of Linear simultaneous equations (Cramer's Rule )
- ◆ Matrices
- Definition of Matrix
- Notation
- Types of Matrices
- Algebra of Matrices-Negative, transpose, Equality, Addition and Subtractions, Scalar Multiplication, Matrix Multiplication
- Application to Business Problems.

Book for study and Reference:

- ✓ 1. A text book in Mathematical Techniques  
By A.G.Jumde, M.E.Rebello e Abranches, S.G.Chitale. N.A.Joshi.  
Publishers: Sheth Publishers
- ✓ 2. Business Mathematics by M.L.Vaidya and A.V.Deshpande  
Publishers: manishaPrakashan
3. Business Mathematics by A.N.Bapat, D.L.Rana  
Publishers: MenenPrakashan
4. Business Mathematics by FaiyazGawal and S.V.Kelkar  
Publishers: Reliable Publication
- ✓ 5. Basic Mathematics for Commerce by N.K.Shah  
Publishers: Sheth Publishers

6. Business Mathematics by S. Shah (for ICWAI International Course)  
Publishers: New Central Book Agency
7. Business Mathematics by Dr. Amarnath Dikshit and Dr. Jinendra Kumar Jain  
Publishers: Himalaya Publishing House
8. Mathematics and Statistics by Ajay Geol and Alka Goel
9. Business Mathematics by M. E. Rebello Abranches.

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- Types of Sets: Finite and infinite sets, null set, singleton set, disjoint sets
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- Venn Diagram
- De Morgan's Laws, Verification by examples and Venn Diagram
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III. PERMUTATIONS AND COMBINATIONS (10 MARKS - 12 LECTURES)

- Permutations
- Fundamental Principle (statement of principle)
- Factorial notation
- Definition of permutation
- Number of permutations of  $n$  things
- Permutations with repetition
- Combinations
- Definition of Combination
- Number of combination of  $n$  things (no proof for results)

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