

**MATHEMATICAL
TECHNIQUES I
100 Marks- 75 Lectures**

- 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 AlkaGoel**
9. **Business Mathematics by M. E. Rebello Abranches.**