

Foundation Course in Mathematics for BCA students who have studied Science in PUC but have not studied Mathematics

Fundamentals of Mathematics	
Teaching Hours : 4 Hours/Week	Credits: 4
Total Teaching Hours: Theory : 60 Hours	Max. Marks: 100 (S.A.-60 + I.A.-40)

Course Learning Outcomes: This course will enable the students to:

- Study and solve problems related to connectives, predicates and quantifiers under different situations.
- Understand the basic concepts of Venn Diagrams, sets, relations and functions.
- Develop basic knowledge of matrices and to solve equations using Cramer's rule.
- Develop the knowledge about the techniques of differentiation and integration of a function with real variables.

Unit I: Basics of logic - Propositions and truth values, connectives-negation, conjunction, disjunction, conditional and biconditional and truth tables, inverse, converse and contrapositive of a statement, tautology, contradiction, logical equivalence. **15 hours**

Unit II: Set Theory - Introduction, Sets and their representations, The Empty set, Finite and Infinite Sets, Equal Sets, Subsets, Power Set, Universal Set, Venn Diagrams, Operations on sets, Complement of a Set, Problems on Union and Intersection of Two Sets. Cartesian product, relations, functions, types of functions, composition of functions. **15 hours**

Unit III: Matrices - Definition of a matrix; types of matrices, algebra of matrices, Properties of determinants, calculations of values of determinants up to third order, Adjoint of a matrix, elementary row and column operations, solution of a system of linear equations having unique solution and involving not more than three variables. **15 hours**

Unit IV: Basics of calculus - Functions and limits, simple differentiation of algebraic functions, techniques of differentiation, Integral of a function and techniques of integration, Basic problems. **15 hours**

Reference Books:

1. B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, New Delhi
2. Discrete and Combinatorial Mathematics, Ralph P. Grimaldi, B.V. Ramana, Fifth Edition, Pearson
3. Discrete Mathematical structures, Sixth edition, Kolman, Busby, Ross, PHI.
4. A Text Book of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand.
5. Differential Calculus for beginners (old edition), Joseph Edwards, Classic texts series, Arihant.
6. Integral Calculus for beginners (second edition), Joseph Edwards, Classic texts series, Arihant.

Question Paper Pattern for the Foundation Course in B. C. A.
4 Credits (S.A. - 60 + I.A. - 40)

Duration: 02 hours

Max. Marks: 60

PART- A	
Answer any 4 questions	4 X 2 = 8
Question Numbers - 1 to 6	
PART- B	
Answer any 4 questions	4 X 3 = 12
Question Numbers -7 to 12	
PART- C	
Answer any 4 questions	4 X 5 = 20
Question Numbers - 13 to 18 (From Unit 1 and Unit 2)	
PART-D	
Answer any 4 questions	4 X 5 = 20
Question Numbers - 19 to 24 (From Unit 3 and Unit 4)	

Note: The question paper shall strictly adhere to the following blueprint:

Blueprint

Unit	Number of two marks questions	Number of three marks questions	Number of five marks questions	Total number of questions
Unit 1	01	02	03	06
Unit 2	02	01	03	06
Unit 3	01	02	03	06
Unit 4	02	01	03	06