

**BSc (IT)**

**DSC-3 Discrete Mathematical Structures (LTP:4:2:0)**

**6 Credits**

**UNIT – I**

Set Theory: Sets and Subsets, Set Operations and the Laws of Set Theory, Counting and Venn Diagrams, Cartesian Products and Relations, Functions–One-to-One, Onto Functions, Function Composition and Inverse Functions; Properties of Relations,

**UNIT – II**

Fundamentals of Logic: Proposition, Logical Connectives and Truth Tables, Logic Equivalence – The Laws of Logic, Logical Implication – Rules of Inference.

**UNIT – III**

Mathematical Induction and Recursion: Sequences and summations, Mathematical Induction, The Well Ordering Principle, Recursive Definitions, Structural Induction, Pigeonhole Principle, Permutation and Combinations.

**UNIT – IV**

Graphs: Introduction, Representing Graphs, Connectivity, Euler and Hamilton Paths, Shortest path problems, Trees: Introduction, Applications of Trees, Spanning Trees, Minimum Spanning Trees.

**Text Books:**

1. Ralph P. Grimaldi, “Discrete and Combinatorial Mathematics”, 5 th Edition, Pearson Education, 2004.
2. Kenneth H. Rosen, “Discrete Mathematics and its Applications”, 6 th Edition, McGraw Hill, 2007.
3. Jayant Ganguly, “A Treatise on Discrete Mathematical Structures”, SanguinePearson, 2010.
4. D.S. Malik and M.K. Sen, “Discrete Mathematical Structures: Theory and Applications”, Thomson, 2004.
5. Thomas Koshy, “Discrete Mathematics with Applications”, Elsevier, 2005, Reprint 2008.