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(Autonomous)
Kanuru, Vijayawada-07

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CA1T1: Discrete Mathematical Structures

UNIT-I: Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

UNIT-II: Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-III: Set Theory: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Comports of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application.

UNIT-IV: Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT-V: Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion.

UNIT-VI: Recurrence Relations: Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT-VII: Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, and planar Graphs

UNIT-VIII: Applications of Graph: Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Books:

1. Discrete and Combinatorial Mathematics – An Applied Introduction – 5th Edition – Ralph. P. Grimaldi, Pearson Education 2003.
2. Discrete mathematics and its applications, Kenneth H. Rosen, 7th Edition, McGraw-Hill, 2012.

Reference Books:

1. Discrete Mathematics, Norman Biggs, Oxford, Tenth edition 2010
2. Discrete Mathematics for Computer Scientists and Mathematicians. Joe L. Mott, Abraham Kandel, and Theodore P. Baker, Prentice Hall, 1986.
3. Discrete mathematics structure with application to computer science, Tremblay. JP & Manohar P., Mc-Graw-Hill,2004.
4. Elements of Discrete Mathematics, C. L. Liu, McGraw-Hill, third edition 2008.