

CSE-203-F

DISCRETE STRUCTURES

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Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A: Set Theory and Propositional Calculus

Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations and lattices Function and its types, Composition of function and relations, Cardinality and inverse Relations Introduction to propositional Calculus: Basic operations: AND(\wedge), OR(\vee), NOT(\sim), Truth value of a compound statement, propositions, tautologies, contradictions.

Section B: Techniques of Counting and Recursion and recurrence Relation

Permutations with and without repetition, Combination. Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Section C: Algebraic Structures

Definition and examples of a monoid, Semi group, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Section D: Section Graphs and Trees

Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Sub graphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eulerian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

TEXT BOOK:

1. Elements of Discrete Mathematics, C.L Liu, 1985, McGraw Hill

REFERENCE BOOKS:

1. Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
2. Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
3. Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
4. Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985, SRA
5. Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
6. Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
7. Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
8. Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.