GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY,
EAST DELHI CAMPUS,
SURAJMAL VIHAR-110092

Paper code : ARD 209	L	T/P	C
Subject : Foundation of Computer Science	4	0	4

Marking Scheme

1. Teachers Continuous Evaluation: 25 Marks
2. End Term Theory Examination: 75 Marks

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 75**

1. There should be 9 questions in the end term examination question paper
2. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 15 marks.
3. Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit. Each question should be 15 marks.
4. The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/ level of the questions to be asked should be at the level of the prescribed textbooks.
5. The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required

Course Outcomes:

CO1:	Ability of students to understand the basic knowledge of combinatorial problems.
CO2:	Ability of students to understand the basic knowledge of Algebraic Structure.
CO3:	Ability of students to understand the basic knowledge of Graph Theory.
CO4:	Ability of students to understand the basic knowledge of Group Theory.

Course Outcomes (CO) to Programme Outcomes (PO) Mapping (Scale 1: Low, 2: Medium, 3: High

CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	3	3	3	3	3	-	-	-	1	1	1	2
CO2	3	3	3	3	3	-	-	-	1	1	1	2
CO3	3	3	3	3	3	-	-	-	1	1	1	3
CO4	3	3	3	3	3	-	-	-	1	1	1	3

UnitI **[10]**

Formal Logic: Preposition, Symbolic Representation and logical entailment theory of Inferences and tautologies, Predicates, Quantifiers, Theory of inferences for predicate calculus, resolution. **Techniques for theorem proving:** Direct Proof, Proof by Contraposition, proof by contradiction.

Unit II **[12]**

Overview of Sets and set operations, permutation and combination, principle of inclusion, exclusion (with proof) and pigeonhole principle (with proof), Relation, operation and representation of a relation, equivalence relation, POSET, Hasse Diagrams, extremal Elements, Lattices, composition of function, inverse, binary and n-ary operations.

Unit III **[11]**

Principle of mathematical induction, principle of complete induction, solution methods for linear and non-linear first-order recurrence relations with constant coefficients, Graph Theory: Terminology, isomorphic graphs, Euler's formula (proof) ,chromatic number of a graph, five color theorem(with proof), Euler &Hamiltonian paths.

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Unit IV [11]

Groups, Symmetry, subgroups, normal subgroups, cyclic group, permutation group and cayles's theorem(without proof), cosets lagrange's theorem(with proof) homomorphism, isomorphism, automorphism, rings, Boolean function, Boolean expression, representation & minimization of Boolean function.

Text Books:

1. Norman L. Biggs, "*Discrete Mathematics*", Oxford, second edition.
2. Keneth H. Rosen, "*Discrete Mathematics and Its Applications*", TMH, seventh edition

Reference Books:

1. Kolman, Busby & Ross (1996), "*Discrete Mathematical Structures*", PHI.
2. C.L. Liu (2000), "*Elements of Discrete Mathematics*", TMH.
3. J. P. Trembly & P. Manohar (1997), "*Discrete Mathematical Structures with Applications to Computer Science*", McGraw Hill.

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