MA 9112 MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

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UNIT I LOGIC 9

Statements – Connectives – Truth Tables – Normal Forms – Predicate Calculus – Inference Theory for Statement Calculus**.**

UNIT II COMBINATORICS 9

Permutations and Combinations – Mathematical Induction – Pigeonhole principle – Principle of Inclusion and Exclusion – Recurrence relations – Solution by generating functions and characteristics equations.

UNIT III ALGEBRAIC STRUCTURES 9

Groups – Cyclic group – Permutation group (S_n and D_n) – Substructures – Homomorphism – Cosets and Lagranges Theorem – Normal Subgroups – Rings and Fields (definition and examples).

UNIT IV RECURSIVE FUNCTIONS 9

Recursive functions – Primitive recursive functions – Computable and Non-Computable functions.

UNIT V LATTICES 9

Partial order relation – Posets – Hasse diagram – Lattices – Special Lattices – Boolean Algebra.

L + T: 45+15 =60

TEXTBOOKS

1. Trembley.J.P. and Manohar R. “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw – Hill Publishing Company Limited, New Delhi. Reprinted in 2007.
2. Grimaldi R.P. and Ramana B.V. “Discrete and Combinatorial Mathematics”, Pearson Ediction, Reprinted in 2006. (5^{th} Edition) – (for Section 2 only).

REFERENCES

1. Kenneth H. Rosen, “Discrete Mathematics and its Applications”, Tata McGraw Hill Publishing Company Limited, New Delhi. Reprinted in 2007 (6^{th} Edition).
2. Thomas Koshy, “Discrete Mathematics with Applications”, Academic Press, Reprinted in 2005.