

Paper –III (Optional): Any one of the following papers –

3227 A

THIRD YEAR B. Sc. MATHEMATICS

**PAPER -III (A)
DISCRETE MATHEMATICS**

Duration: 3 Hours

Max. Marks: 75

UNIT – I

Sets and propositions – cardinality, Mathematical Induction, Principle of Inclusion and exclusion. Computability and formal language- ordered set. Language phrase structure Grammars. Types of Grammars and languages. Permutation and combinations: Simple problems.

UNIT –II

Relations and functions:- Binary Relations, Equivalent Relations and Partitions, Partial order relations and lattices, Pigeon Hole principle. Graphs and planar graphs: - Basic Terminology; Multigraphs, weighted graphs, paths and circuits shortest paths. Eulerian paths and circuits. Planar graphs.

UNIT – III

Trees (Elementary Theorems): Rooted trees, Binary tree, spanning tree, minimal spanning tree. Pumping lemma. Finite state machine. Elementary ideas of Equivalent machines, Finite state machine as Recognizers. Analysing Algorithms– Time complexity.

UNIT –IV

Recurrence Relations and Recursive Algorithms: Linear Recurrence Relations with constant coefficients, Homogeneous solutions, Particular solution, Total solution, Solution by the method of generating functions.

UNIT – V

Brief review of groups and Rings. Boolean Algebras – Lattices: elementary of Duality, Distribution and complemented Lattices. Boolean Lattice. Elementary ideas of Boolean Algebras, Boolean function and expressions, Logic & Propositional calculus, Design and Implementation of Digital network - Switching circuits.

References:

1. C.L. Liu : Elements of Discrete Mathematics
2. K.D. Joshi : Foundation of Discrete Mathematics
3. Mradula Garg & R. Panday : विविक्त गणित
4. Gokhroo et.al : विविक्त गणित