

UNIT I

Finite Automata: Deterministic FA, Non deterministic FA, Regular expressions, Finite Automaton with ϵ - moves, Regular Expression, Regular Languages and Kleene's theorem- Conversion of NFA to DFA, Equivalence of finite Automaton and regular expressions, Arden's Theorem. Myhill Nerode

74 | SCHEME OF COURSES AND EXAMINATION: B.Tech. CSE, NSUT MAIN CAMPUS

Theorem, Minimization of DFA, Pumping Lemma for Regular sets, Problems based on Pumping Lemma.

UNIT II

Context Free Grammar: Grammar, Types of Grammar, Context Free Grammars and Languages, Derivations, Ambiguity, Relationship between derivation and derivation trees, Simplification of CFG, Elimination of Useless symbols - Unit productions - Null productions, Chomsky normal form (CNF), Greibach Normal form (GNF), Problems related to CNF and GNF.

UNIT III

Pushdown Automata: Moves, Instantaneous descriptions, Deterministic pushdown automata, Equivalence of Pushdown automata and CFL, pumping lemma for CFL, problems based on pumping Lemma.

UNIT IV

Turing Machine: Definitions of Turing machines, Computable languages and functions, Techniques for Turing machine construction, Multi head and Multi tape Turing Machines, The Halting problem, Partial Solvability, Problems about Turing machine- Chomsky hierarchy of languages.

UNIT V

Difficult problems: Unsolvability Problems and Computable Functions, Primitive recursive functions, Recursive and recursively enumerable languages, Universal Turing machine, Measuring and classifying complexity - Tractable and Intractable problems,