

AMCS-15 THEORY OF COMPUTATION

UNIT-1 STRINGS, ALPHABET, LANGUAGE, OPERATIONS,

- 1.1 Finite state machine,
- 1.2 Definitions, finite automaton model,
- 1.3 Acceptance of strings, and languages,
- 1.4 Non-deterministic finite automaton,
- 1.5 Deterministic finite automaton,
- 1.6 Equivalence between NFA and DFA,
- 1.7 Conversion of NFA into DFA,
- 1.8 Minimization of FSM, equivalence between two FSM's,
- 1.9 Moore and Melay machines.

UNIT-2 REGULAR SETS, REGULAR EXPRESSIONS

- 2.1 Identity rules, manipulation of regular expressions,
- 2.2 Equivalence between RE and FA,
- 2.3 Inter conversion, pumping lemma,
- 2.4 Closure properties of regular sets (proofs not required),
- 2.5 Regular grammars,
- 2.6 Right linear and left linear grammars equivalence between regular linear grammar and FA,
- 2.7 Inter conversion,
- 2.8 Enumeration of properties of CFL (proofs omitted).

UNIT-3 TURING MACHINE

- 3.1 Definition, model, acceptance of CFL,
- 3.2 Equivalence of CFL and PDA,
- 3.3 Inter conversion,
- 3.4 Enumeration of properties of CLF (Proofs omitted).

UNIT-4 CHOMSKY HIERARCHY OF LANGUAGES

- 4.1 linear bounded automata and context sensitive language,
- 4.2 Introduction to DCFL and DPDA, LR(O) grammar,
- 4.3 Decidability of, problems,
- 4.4 Universal Turing Machine, undecidability of posts.
- 4.5 Correspondence problem, Turing reducibility,
- 4.6 Definition of P and NP problems,
- 4.7 NP complete and NP hard problems.

Reference Books:

1. Hopcroft H.E. and Ullman J. D. "Introduction to Automata Theory Languages and Computation".
2. Lewis H.P. & Papadimition C.H. "Elements of Theory of Computation", Prentice Hall.