# AMHE15 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.