

SWITCHING THEORY AND LOGIC DESIGN:

UNIT I

Review of Number systems:

- i) Representation of numbers of different radix, conversion of numbers from one radix to another radix, $r-1$'s complement and r 's complement of unsigned numbers subtraction, problem solving.
- ii) 4-bit codes: BCD, Excess 3, 2421, 84-2-1, 9's complement code etc.,
- iii) Logic operation, error detection and correction codes; Basic logic operations-NOT, OR, AND, universal building blocks, EX-OR, EX-NOR Gates, standard SOP and POS forms, Gray code, error detection and error correction codes (parity checking even parity, odd parity, Hamming code) NAND-NAND and NOR-NOR realizations.

UNIT II

MINIMISATION TECHNIQUES: Boolean theorems, principle of complementation & duality, De-morgan theorems, Minimization of switching functions using K-Map up to 6-variables, Tabular minimization, Problem solving (code converters using K-Map etc..).

UNIT III

COMBINATIONAL LOGIC CIRCUITS DESIGN: Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary adder, 4-bit binary subtractor, BCD adder circuit, Excess 3 adder circuit, look-a-head adder circuit. Design of decoder, De-multiplexer, 7 segment decoder, higher order De-multiplexing, encoder, multiplexer, higher order multiplexer, realization of Boolean functions using decoders and multiplexers, priority encoder, 4-bit digital comparator.

UNIT IV

INTRODUCTION OF PLD'S: PROM, PLA, PAL-Basics structures, realization of Boolean function with PLDs, programming tables of PLDS, merits & demerits of PROM, PLA and PAL comparison, realization of Boolean function using PROM, PLA and PAL, Programming tables of PROM, PLA and PAL.

UNIT V

SEQUENTIAL CIRCUITS I: Classification of sequential circuits (synchronous and asynchronous): basic flip-flops, truth tables and excitation tables (nand RS latch, nor RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with reset and clear terminals), Conversion of flip-flop to another flip-flop. Design of ripple counters, design of synchronous counters, Johnson counters, ring counters. Design of registers- Buffer register, control buffer register, shift register, bi-directional shift Register, universal shift register.

UNIT VI

SEQUENTIAL CIRCUITS II: Finite state machine; analysis of clocked sequential circuits, state diagrams, state tables, reduction of state tables and state assignment, design procedures. Realization of circuits using various flip-flops, Meelay to Moore conversion and vice-versa.

TEXTBOOKS:

1. Switching theory and logic design by Hill and Peterson Mc-Graw Hill TMH edition
2. Switching Theory and Logic Design by A. Anand Kumar
3. Digital design by mano PHI.

REFERENCE BOOKS:

1. Modern Digital Electronics by RP Jain, TMH.
2. Micro electronics by Millman MH edition.
3. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers.