Module 1:

NUMBER SYSTEMS: Binary, Octal, Decimal, Hexadecimal. Number base conversions, 1's, 2's complements, signed Binary numbers. Binary Arithmetic, Binary codes: Weighted BCD, Gray code, Excess 3 code, ASCII.

LOGIC GATES: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR. Implementations of Logic Functions using gates, NAND-NOR implementations.

Module 2 :

BOOLEAN ALGEBRA: Boolean postulates and laws – De-Morgan's Theorem, Principle of Duality, Boolean expression – Boolean function, Minimization of Boolean expressions – Sum of Products (SOP), Product of Sums (POS), Minterm, Maxterm, Canonical forms, Conversion between canonical forms, Karnaugh map Minimization, Don't care conditions, Quine-McCluskey method.

Module 3:

COMBINATIONAL CIRCUITS: Design procedure – Adders, Subtractors, BCD adder, Magnitude Comparator, Multiplexer/ Demultiplexer, encoder/decoder, parity checker, code converters. Implementation of combinational logic using MUX, BCD to 7 segment decoder.

SEQUENTIAL CIRCUITS: Flip flops SR, JK, T, D and Master slave, Excitation table, Edge triggering, Level Triggering, Realization of one flip flop using other flip flops. Asynchronous/Ripple counters, Synchronous counters, Modulo-n counter, Ring Counters. Design of Synchronous counters: state diagram, Circuit implementation. Shift registers.

Module 4:

MEMORY DEVICES: Classification of memories, RAM organization, Write operation, Read operation, Memory cycle. ROM organization, PROM, EPROM, EEPROM, Programmable logic array, Programmable array logic, complex Programmable logic devices (CPLDS), Field Programmable Gate Array (FPGA).

A/D & D/A CONVERTORS : Analog & Digital signals. sample and hold circuit, A/D and D/A conversion techniques (Weighted type,

R-2R Ladder type, Counter Type, Dual Slope type, Successive Approximation type).