Subject Code : P8MCA1

Core Course I
Digital Electronics and Computer Organization

Unit I

Number Systems: Decimal, Binary, Octal and Hexadecimal number systems- Conversion between number systems- Binary arithmetic-BCD codes – BCD addition- Alphanumeric codes. Boolean Algebra and logic gates : AND, OR, NOT, NAND, NOR, XOR and XNOR gates - Truth tables - Basic laws of Boolean Algebra – De-Morgan's theorems.

Unit II

Simplifications of Boolean expressions - Canonical SOP and POS forms - Karnaugh maps- Implementing Boolean expressions using NAND gates alone- Implementing Boolean expressions using NOR gates alone.
Combinational logic circuits: Half and Full adders - Half and Full subtractors - Parallel binary adder - BCD adder - Encoders- Decoders - Multiplexers- Demultiplexers.

Unit III

Sequential logic circuits: NAND latch – SR flip-flop- JK flip-flop – Edge triggering- PRESET and CLEAR inputs – Shift register - Universal shift register - Asynchronous and Synchronous counters – BCD counter.

Unit IV

Parallel Computer Models: Introduction - Flynn's Classifications - Parallel & Vector Computer System - Attributes to performance - implicit and explicit parallelism - shared memory – multiprocessors – Uniform and Non-Uniform Memory Access and Cache only Memory Access Models – Distributed Memory Multicomputers – Multivector & SIMD Computers – PRAM and VLSI Module

UNIT- V

Processors and Memory Hierarchy: CISC & RISC Architectures – CISC Family – RISC Scalar processors – Super Scalar Processors and their features – Very Long Instruction word Architecture vector & symbolic processors, Memory hierarchy

TEXT BOOK(S)

1. Thomas Bartee C, Digital Computer Fundamentals, TMH, 3rd Edition
2. Moris Mano, Computer Architecture and Logic Design, TMH Publications
3. Malvino and Brown, Digital Computer Electronics, TMH, III rd Edition

REFERENCE(S)

1. Malvino and Leech "Digital Principles and Applications", TMH
2. Liu and Gibson "Microcomputer Systems" PHI