

CORE COURSE – VIII - DIGITAL COMPUTER FUNDAMENTALS

UNIT – I

Number Systems and Logic Circuits: Number systems - Decimal, Binary, Octal, Hexadecimal - conversion from one to another - Characters and codes - ASCII code, Excess-3 code, gray code - binary addition, subtraction, multiplication and division - unsigned binary numbers - signed magnitude numbers - complements in number systems - Truth tables, AND, OR, NOT, NOR & NAND gates, EX-OR gates - parity generators and checkers.

UNIT – II

Boolean Algebra and Digital Circuits : Boolean laws and theorems - De Morgan's theorems - Duality theorem - simplification of sum of product and product of sum expressions - Karnaugh map and simplifications - Simple arithmetic circuits - Half and Full adders - Binary adder/subtractor - BCD adder - Data processing circuits - Multiplexers - Demultiplexers - Encoders and Decoders.

UNIT –III

Sequential Logic Design : Flip-flops - RS, JK, D & T Flip flops - Master/Slave Flip flop - Shift Registers - Counters - Asynchronous and Synchronous Counters.

UNIT – IV

D/A And A/D Conversion : D/A converter - D/A accuracy and resolution -A/D Converter - simultaneous conversion - counter method - continuous conversion - A/D techniques - Dual Slope conversion - A/D accuracy and Resolution.

UNIT – V

Memory Elements : RAM - Linear Select memory organization - decoders - Dimensions of memory access - connecting memory chips to a computer bus - static RAM - Dynamic RAM - ROM - Magnetic Disk memories - Magnetic tape - Magnetic Bubble memories - Computer word structures - Storage Hierarchy - Virtual memory - Cache memory.

BOOK (S) FOR STUDY

Units I, II, III, IV

1. Donald P. Leach and Albert Paul Malvino, "Digital Principles and Application", Fifth Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2003.

Unit V

2. Thomas C. Bartee, "Computer Architecture and Logic Design", McGraw Hill International Edition, New Delhi, 1991.

BOOK (S) FOR REFERENCE

1. Virendra Kumar, "Digital Technology Principles and Practice", New Age International, New Delhi, 2006