AMPT06 DIGITAL ELECTRONIC CIRCUITS

UNIT-1 INTRODUCTION TO DIGITAL ELECTRONICS IN THE FIELD OF PRINTING

UNIT-2 LOGIC GATES AND BOOLEAN ALGEBRA:

2.1 Boolean constant and variable, OR, AND, NOT, NAND, and NOR gates, truth tables, Boolean expressions, Boolean algebra.

2.2 De Morgan's theorems. Realisation of Boolean expressions using universal gates.

UNIT-3 COMBINATIONAL LOGIC CIRCUITS:

3.1 Simplification of Boolean expression and realization using logic gates, sum of products and product of sums, Karnaugh map & variable, minimization of Boolean expressions using

3.2 Karnaugh map, don't care conditions, variable entered mapping, minimization using variable entered maps.

UNIT-4 NUMBERING SYSTEMS & BINARY ARITHMETIC:

4.1 Introduction. Symbolic number systems, Positional number system, Integer Binary numbers - Binary digital computers, Binary number system,

4.2 Conversions between decimal and binary numbers, Hexadecimal numbers, Conversion between Hexadecimal, Binary & Decimal numbers.

4.3 Fractional binary numbers - Converting binary fractions to decimal, Converting Hexadecimal fractions to decimal, Converting decimal fractions to Binary and Hexadecimal.

4.4 Number System Notation. Binary Addition and Subtraction - Signed binary numbers, Complementary numbers, Two's complement mathematics.

4.5 Binary multiplication & division. Binary codes - Character codes, Numeric codes, other binary codes, Error correction & detection codes.

UNIT-5 ARITHMATIC CIRCUITS

5.1 EXOR and EXNOR gates, half adder, full adder, full subtractor, adder-subtractor, look ahead and carry.

UNIT-6 DATA PROCESSING CIRCUITS

6.1 Multiplexers, demultiplexers, decoders, BCD to decimal decoder, seven segment decoder,

6.2 Encoders, decimal to BCD encoder, parity generators and checkers.

UNIT-7 FLIP-FLOPS

7.1 NAND gate latch, NOR gate latch, SR flip-flop, D flip-flop, JK flip-flop and T flip-flop,

7.2 Clocked flip-flops, edge-triggered flip-flops, flip-flop conversions.

UNIT-8 SEQUENTIAL LOGIC CIRCUITS

8.1 Comparison between combinational and sequential logic circuits, shift registers,

8.2 SISO, SIPO, PISO and PIPO shift registers, ring counter, Jhonson counter.

UNIT-9 COUNTERS

9.1 Ripple counters, up counter, down counter, up-down counter,

9.2 Synchronous counters, mod number, mod-3, mod-5 and mod-10 counters, shift counters.

UNIT-10 D/A AND A/D CONVERTERS

10.1 Variable-Resistor network, binary ladder, D/A converter. D/A accuracy and resolution, A/D converter simultaneous conversion, counter method,

10.2 Continuous conversion, successive approximation method, single slope and dual slope A/D converters.

UNIT-11 DIGITAL CAMERA AND DIGITAL SCANNER.

References Books:

1. Digital Electronics – Malvino.
2. Digital Electronics – Gothman.
3. Digital Principles and Applications - Donald P Leach, Albert Paul Malvino.
4. Digital Systems-Principles and Applications - Ronald J.Tocci.
5. Digital Fundamentals - Floyd.