

# MIT(CS)-302

## Introduction Digital Systems

### Block-1

#### Unit-1

Introduction to number system, Conversions, Representation of Negative Numbers, One's Complement Two's Complement

#### Unit-2

Binary Coded Decimal, Unit Distance Codes, Alphanumeric Codes, Error Detection Codes , Error Correcting Codes

#### Unit-3

Boolean Algebra and Huntington Postulates, Propositions from Huntington's Postulates , Boolean Operators.

#### Unit-4

Logic Functions in Algebraic Form, Truth Table Description of Logic Functions, Conversion of English Sentences to Logic Functions, Minterms and Maxterms, Circuit Representation of Logic Function

### Block-2

#### Unit-1

Karnaugh -Map, Three-Variable Karnaugh Map , Four-variable Karnaugh Map, Five-variable Karnaugh Map , Boolean functions in POS, Simplification of Incompletely Specified Functions

#### Unit-2

Principle of Quine-McClusky Method, Generation of Prime Implicants, Determination of the Minimal Set of Prime Implicants, Simplification of Incompletely Specified functions

### **Unit-3**

Logic Gates, Truth Table, AND Gate, OR-Gate, NOT Gate, NAND Gate, NOR Gate, X-OR Gate, X-NOR Gate

### **Unit-4**

Combinational Circuit, Multiplexer and Demultiplexer, Encoder and Decoder, Half adder and Full adder

## **Block-3**

### **Unit-1**

Sequential Circuit ,Flip Flop, RS Flip-Flop, D Flip-Flop ,JK Flip-Flop ,T Flip-Flop, Master-Slave Flip-Flop , JK Master-Slave Flip-Flop

### **Unit-2**

Introduction to Shift registers, ,Types of shift registers, Serial Input, Serial Output (SISO) Shift Register, Serial Input, Parallel Output (SIPO) Shift Register, Parallel Input, Serial Output (PISO) Shift Register, Parallel Input, Parallel Output (PIPO) Shift Register, Application of Shift register

### **Unit-3**

Asynchronous (ripple) counter , Synchronous counter, Working of a three-stage synchronous counter , Decade counter (MOD 10 Counter), Ring Counter, Johnson counter

### **Unit-4**

Introduction to Semiconductor Memories, Read Only Memory (ROM), Random Access Memory (RAM), SRAM vs DRAM, READ Operation in RAM, WRITE Operation in RAM, Flash Memory , Memory Expansion