

## **Paper I - Digital Electronics and Introduction to Computer Architecture**

### **Unit I**

Number Systems: Binary, octal, decimal, hexadecimal and BCD number systems. Representation of positive, negative integers and real numbers. Characters digital codes: ASCII and EBCDIC coding, binary arithmetic in 1's and 2's complement.

### **Unit II**

Boolean Algebra: Logic gates, truth table, logic expression, rules and laws of boolean algebra. Demorgan's theorems, simplification of boolean expression using Karnaugh map (upto 4 variables).

### **Unit III**

Combinational Circuits: Adder, subtractor, comparator, decoder, encoder, multiplexer, demultiplexer. (Block diagram level only)

Flip Flops: Latches, edge-triggered flip flops, pulse triggered flip flop, R-S flip, JK master-slave flip flop, D flip flop, T flip flop.

### **Unit IV**

Shift Registers: Shift register function, serial and parallel shift registers, bi-directional shift registers.

Counters: Asynchronous and synchronous counters, up/down counters, modulo-n counters, BCD counters.

### **Unit IV**

Memory Organization: Basic memory cell, 1- 2-D memory, row and column address, accessing memory, different RAM and ROM types.

Overview of I/O Systems, introduction to microprocessor (8085) and microcontrollers (only organization and signals required)

### **Suggested Books**

1. Thomas L. Floyd, Digital Fundamentals, United Book Stall New Delhi.
2. Mano M.M., Digital Logic and Computer Design, Prentice Hall of India Private Limited New Delhi.
3. Hayes J.P., Computer Organization and Architecture, Tata Mc-Graw Hill Publishing Company Limited New Delhi.
4. Mano M.M., Computer System Architecture, Prentice Hall of India Private Limited New Delhi.