Subject Code : RCCSIE5

CORE COURSE VII - DIGITAL ELECTRONICS

Unit I – Basics and Number Systems

Digital signals – basic digital circuits – NAND, NOR and EXOR – Boolean algebra. Binary number systems – signed binary numbers – binary arithmetic – 2's complement arithmetic. Octal number system – hexadecimal number system. Codes – error codes.

Unit II - Combinational Logic Design

Standard representation for logical functions – Karnaugh map – representation of logical functions – simplification – SOP and POS – Don't care conditions – five and six variable Karnaugh maps. Multiplexer – demulplexer – adder – subractor.

Unit III – Digital Comparator and Flip-flops

BCD arithmetic – ALU – digital compartor – parity generator / checker. Code converter – priority encoder. Clocked SR FF – JK FF – D FF – T FF – excitation table for flip flops – flip-flop design – edge and level triggered FFs – Master Slave FFs. Applications.

Unit IV – Sequential Logic Design and Timing Circuits

Registers – applications of shift registers – asynchronous counters – synchronous counters – sequential circuit design – timing circuits – Schmitt trigger ICs – monostable multivibrator – 555 timer as a timing device.

Unit V – Converters, Memories and Programmable Logic Devices

DAC- ADC – ROM, RAM – charge coupled device. Memory – PLD – PLA – PAL – field programmable gate array – applications.

Books for Study :

1. Modern Digital Electronics (2nd Edition), R.P.Jain, Tata McGraw Hill, 1997.
2. Computer System Architecture, 2nd Edn., M.Morris Mono, Prentice Hall, 1998.
3. Digital Electronics, V.K.Puri, Tata McGraw Hill.