

Digital Electronics (EC-3001)

Course Code	EC-3001	Credits-4	L – 3, T-1, P-0
Name of the Course	Digital Electronics		
Lectures to be Delivered	52 (1 Hr Each) (L= 39, T = 13 for each semester)		
Semester End Examination	<i>Max. Marks: 100</i>	<i>Min. Pass Marks: 40</i>	Maximum Time:3hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			<i>Max. Marks:50</i>

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D, and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 40% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 15% of the total marks of the semester end examination for the course.

2. **For Candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Binary, Octal & Hexadecimal number systems and their inter conversion, Binary arithmetic (addition, subtraction, multiplication and division). 1's & 2's complements, 9's and 10's compliments, BCD code, BCD addition, Gray code, Error Detection and correction, Hamming code.

Section B

Logic functions (OR, AND, NOT, NAND, NOR, XOR), Elements of Boolean Algebra (Theorems truth tables and relation's), negative and positive logic, saturated and non saturated logic, fan in, fan out, Logic IC's, de Morgan's Theorem, minterms and maxterms, Karnaugh mapping, K-map representation of logical function for 2, 4 variable, simplification of Boolean equations with the help of K-map, Various minimisation techniques, Quine's method and Quinnes Mc-Cluskey method, Half adder, full adder, half subtractor, full subtractor, serial and parallel binary adder.

Section C

Introduction and performance criteria for logic families, various logic families-DCTL, RTL, DTL, TTL & EC working and their characteristics in brief, MOS Gates and GMOS Gates, comparison of various logic families.

Section D

Various kinds of Flip-Flop: RS Flip-Flop, Clocked RS Flip-Flop, Edge triggered D Flip-Flop, Flip-Flop Switching time, JK Flip-Flop, JK Master Slave Flip Flop, lock wave forms, 555 timer as a stable multivibrator. shift registers: serial in serial out, parallel in parallel out, ring counters, asynchronous counters, synchronous counters. D/A converter, A/D converter, clipping and clamping circuits, astable, monostable, bistable multivibrator using transistor.

Books:

1. Malvino and Leach, Digital Principles and Applications,
2. Taub and Schilling ,Digital Integrated Electronics,.
3. Samuel C Lee, Digital Circuits and Logic Design4. Pulse, Digital and Switching Waveforms, Millman and Taub.
4. Lionel Warnes, Macmillan Press Limited Analogue and Digital Electronics, London, 1998.