Subject: Digital Electronics **Name of the Faculty: Sh. Anit Kumar**		
Week	Topic(Theory)	**Topic(Practical)**
1	Distinction between analog and digital signal. Applications and advantages of digital signals	Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR(EXNOR) gates
2	Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa. Binary addition and subtraction including binary points. 1's and 2's complement method of addition/subtraction	
3	Concept of code, weighted and non-weighted codes, examples of 8421, BCD, excess-3 and Gray code. Concept of parity, single and double parity and error detection	
4	Concept of negative and positive logic Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.	
5	Introduction to TTL and CMOS logic families Postulates of Boolean algebra, De Morgan's Theorems. Implementation of Boolean (logic) equation with gates	Realisation of logic functions with the help of NAND or NOR gates
6	Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits	To design a half adder using XOR and NAND gates and verification of its operation Construction of a full adder circuit using XOR and NAND gates and verify its operation
7	Half adder and Full adder circuit, design and implementation. 4 bit adder circuit	Verification of truth table for encoder and decoder ICs, Mux and DeMux
8	Four bit decoder circuits for 7 segment display and decoder/driver ICs. Basic functions and block diagram of MUX and DEMUX with different ICs Basic functions and block diagram of Encoder	
9	Concept and types of latch with their working and applications Operation using waveforms and truth tables of RS, T, D, Master/Slave JK flip flops. Difference between a latch and a flip flop	
10	Introduction to Asynchronous and Synchronous counters Binary counters	Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch , D flip-flop, JK flip-flops).
11	Divide by N ripple counters, Decade counter, Ring counter	To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and verification of their operation
12	Serial in parallel out, serial in serial out, parallel in serial out	
13	parallel in parallel out.Universal shift register	
14	Working principle of A/D and D/A converters Brief idea about different techniques of A/D conversion and	

	study of :Stair step Ramp A/D converterDual Slope A/D converterSuccessive Approximation A/D Converter	
15	Detail study of : Binary Weighted D/A converterR/2R ladder D/A converter Applications of A/D and D/A converter	
16	Memory organization, classification of semiconductor memories (RAM, ROM, PROM, EPROM, EEPROM), static and dynamic RAM, introduction to 74181 ALU IC	To design a 4 bit ring counter and verify its operation. Use of Asynchronous Counter ICs (7490 or 7493)

Note: Last (5^{th}) Lecture of week will be the revision lecture. Practical/Lab. Experiments will be conducted as per the latest guidelines of Higher Authority.