ACADEMIC LESSION PLAN FOR WINTER - 2023

Dept. of Electronics & Telecommunication, Govt. Polytechnic , Balasore

Name of the Faculty: Yogasakti Yogamaya (Lecturer, E&TC)

DIGITAL ELECTRONICS (TH-3)

Theory : 4 P/W
Total Period s : 60 P/ Sem
Examination : 3 Hours
Sem : 3rd E&TC

Internal Assessment : 20 Marks
End Semester Exam : 80marks
TOTAL MARKS : 100 Marks
Start of Class : 1.8.2023

WEEK	PERIOD	TOPIC
1st	1st	**Unit-1: Basics of Digital Electronics** 1.1 Number System-Binary, Octal, Conversion from one system to another number system.
	2nd	Decimal, Hexadecimal - Conversion from one system to another number system.
	3rd	1.2 Arithmetic Operation-Addition, Subtraction, Multiplication, Division,
	4th	1's & 2's complement of Binary numbers& Subtraction using complements method
2nd	1st	1.3 Digital Code & its application & distinguish between weighted & non-weight Code, Binary codes, excess-3 and Gray codes.
	2nd	1.4 Logic gates: AND,OR,NOT,NAND,-Symbol, Function, expression, truth table & timing diagram
	3rd	NOR, Exclusive-OR, Exclusive-NOR--Symbol, Function, expression, truth table & timing diagram
	4th	1.5 Universal Gates& its Realisation
3rd	1st	1.6 Boolean algebra, Boolean expressions, Demorgan's Theorems.
	2nd	1.7 Represent Logic Expression: SOP & POS forms
	3rd	1.8 Karnaugh map (3 & 4 Variables)&
	4th	Minimization of logical expressions ,don't care conditions
4th	1st	**Unit-2: Combinational logic circuits** 2.1 Half adder, Full adder
	2nd	Half Subtractor, Full Subtractor,
	3rd	Serial Binary 4 bit adder.
	4th	Parallel Binary 4 bit adder.
5th	1st	2.2 Multiplexer (4:1),
	2nd	De- multiplexer (1:4)
	3rd	Decoder,
	4th	Encoder
6th	1st	Digital comparator (3 Bit)
	2nd	Continue...
	3rd	2.3 Seven segment Decoder (Definition, relevance, gate level of circuit Logic circuit of above)
	4th	Seven segment Decoder (truth table, Applications of above)
7th	1st	**Unit-3: Sequential logic Circuits** 3.1 Principle of flip-flops operation, its Types,
	2nd	3.2 SR Flip Flop using NAND Latch (un clocked)
	3rd	SR Flip Flop using NOR Latch (un clocked)

	4th	3.3 Clocked SR Flip Flop-Symbol, logic Circuit, truth table and applications
8th	1st	D Flip Flop-Symbol, logic Circuit, truth table and applications
	2nd	JK FLIP FLOP-Symbol, logic Circuit, truth table and applications
	3rd	T Flip Flop-Symbol, logic Circuit, truth table and applications
	4th	JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications
9th	1st	Continue...
	2nd	3.4 Concept of Racing and how it can be avoided.
	3rd	4.5 Concept of memories-RAM, ROM, static RAM, dynamic RAM,PS RAM
	4th	4.6 Basic concept of PLD & applications
10th	1st	**Unit-4: Registers, Memories & PLD** 4.1 Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out
	2nd	4.2 Universal shift registers-Applications.
	3rd	4.3 Types of Counter & applications
	4th	Asynchronous ripple counter (UP & DOWN),
11th	1st	Asynchronous ripple counter (UP & DOWN),
	2nd	4.4 Binary counter,
	3rd	Decade counter.
	4th	Synchronous counter,
12th	1st	Ring Counter
	2nd	**Unit-5: A/D and D/A Converters** 5.1 Necessity of A/D and D/A converters.
	3rd	5.2 D/A conversion using weighted resistors methods.
	4th	5.3 D/A conversion using R-2R ladder (Weighted resistors)network.
13th	1st	5.4 A/D conversion using counter method.
	2nd	5.5 A/D conversion using Successive approximate method
	3rd	Continue.....
	4th	**Unit-6: LOGIC FAMILIES**
14th	1st	6.1 Various logic families
	2nd	categories according to the IC fabrication process
	3rd	6.2 Characteristics of Digital ICs- Propagation Delay, fan-out, fan-in, Power Dissipation
	4th	Noise Margin ,Power Supply requirement &Speed with Reference to logic families.
15th	1st	6.3 Features, circuit operation &various applications of TTL(NAND)
	2nd	CONTINUE....
	3rd	Features, circuit operation &various applications of CMOS (NAND)
	4th	Features, circuit operation &various applications of CMOS (NOR)

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1/8/23