Course Code: 2040414 **Roll No:** **MLRS-R20**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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II B.Tech II Sem Regular End Examination, July 2022

Digital System Design

(ECE)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	Perform the operation $21_{(10)} - 42_{(10)}$ by using 2's complement method.	2M	CO1	BL3
	b)	Convert the number $(125F)_{16}$ to Decimal and then to octal.	2M	CO1	BL3
	c)	Find the complement of F=WX+YZ then show that FF′=0 and F+F′=1.	2M	CO2	BL3
	d)	Implement the function with only NAND gates: F(x,y,z) = Σ(0,6).	2M	CO2	BL5
	e)	Compare Latch and Flip-Flop.	2M	CO3	BL2
	f)	Differentiate combinational and sequential circuits.	2M	CO3	BL2
	g)	Define: i) State table ii) State Diagram.	2M	CO4	BL1
	h)	What is ring counter?	2M	CO4	BL1
	i)	Compare Mealy and Moore machines.	2M	CO5	BL2
	j)	What is an ASM Block?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	i) Convert the given Octal number (2564. 603)8 to Hexadecimal number. ii) Given that (81)10 = (100)b , Find the value of b.	5M	CO1	BL3
	b)	Encode data bits 1101 into 7 bit even parity Hamming Code	5M	CO1	BL4
		OR			
3		Generate Hamming code for the given 11 bit message 10001110101 and rewrite the entire message with hamming code	10M	CO1	BL3
4	a)	Design the full adder circuit using two half adder circuits.	5M	CO2	BL6
	b)	Realize the expression F=Σm(0,1,3,5,8,11,12,14,15) using 8×1 MUX.	5M	CO2	BL4
		OR			
5		For the given function F(A, B, C, D, E) =Σ(0,1, 2, 3, 4, 5, 9, 10, 16, 17, 18, 19, 20, 22, 25, 26)+ Σd (7, 11, 12, 13, 15, 23, 27, 28, 29, 30). Obtain minimal SOP expression using K-Map.	10M	CO2	BL3

6	a)	With the block diagram, Truth table, describe the principle operation of edge triggered negative SR flip flop.	5M	CO3	BL2
	b)	With a neat diagram, explain operation of T flip-flop and derive its truth table, characteristic equation and excitation table.	5M	CO3	BL4
		OR			
7		With a neat circuit diagram and waveforms, explain the operation of Master Slave JK flip flop.	10M	CO3	BL4
8	a)	Draw a state diagram of a sequence detector which can detect 101	5M	CO4	BL1
	b)	Design a parity-bit generator circuit with neat diagrams.	5M	CO4	BL6
		OR			
9		Design a 4 bit ring counter with initial count 1100 loaded in it. Prepare a state table and draw the state diagram including those of unused states and also the output waveforms	10M	CO4	BL6
10	a)	What are the Moore and Melay machines? Compare them.	5M	CO5	BL2
	b)	Write about PLD in detail.	5M	CO5	BL1
		OR			
11		Implement PLA circuit for full-adder circuit.	10M	CO5	BL5

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