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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: ES Cluster (EEE/ ECE) **Duration: 3 hrs.**
Course Code: 19ES3CCDEC **Max Marks: 100**
Course: Digital Electronic Circuits

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

				CO	PO	Marks
			UNIT - I			
1	a)		Simplify the given function using K-Map $f(a,b,c,d)= \Sigma m(1,2,4,11,13,14,15)+d(0,5,7,8,10)$	CO1	PO1	10
	b)		Simplify the following Boolean function using Quine McCluskey method. $F(A,B,C,D) =\Sigma m(0,2,6,7,8,9,10) +d (3,5,15)$	CO1	PO2	10
			UNIT - II			
2	a)		Design and implement a look ahead carry adder. How is it advantageous over Binary ripple adder?	CO2	PO1	10
	b)		Implement a full subtractor using 1:4 DMUX with active low enable input and active low outputs.	CO2	PO2	10
			OR			
3	a)		Design a combinational circuit using a ROM. The circuit accepts a 3-bit number and generates an output binary number equal to the square of the input number.	CO2	PO1	10
	b)		Realize a full adder with inputs as a,b,c as per the design protocol.	CO2	PO2	10
			UNIT - III			
4	a)		Derive the characteristic equation and excitation table for the following flip i) J K Flip flop ii) T flip flop	CO2	PO1	10
	b)		Design a synchronous Mod-6 counter with the following sequence 0,2,3,6,5,1,0……., and repeat. Use D flip-flops. Check whether the counter is self-correcting.	CO2	PO1	10
			OR			
5	a)		Draw a 4-bit shift register using D flip-flops. Show how it can be used as a ring and twisted ring counter.	CO2	PO2	06
	b)		Design a counter using T flip-flops with the following binary sequence 0,4,2,1,6 and repeat.	CO3	PO2	10
	c)		Derive the characteristic equation for T flip-flop.	CO2	PO3	04

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - IV			
	6	a)	Design a Mealy type sequence detector to detect a serial input sequence '1010'using D flip-flop and overlapping. Assume X as the input and Z as the output with the input string X=01101010.	**CO3**	**PO2**	**10**
		b)	Design a Moore type sequence detector to detect a serial input sequence of '101'using D flip-flop and overlapping.	**CO3**	**PO2**	**10**
			UNIT - V			
	7	a)	Explain the working principle of CMOS inverter logic circuit with logic diagram and truth table.	**CO4**	**PO1**	**10**
		b)	Explain any five characteristics of Digital ICs.	**CO4**	**PO2**	**10**

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