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Reg. No. : | | | | | | | | | | |

Question Paper Code: 53402

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2022

Third Semester

Electronics and Communication Engineering

15UEC302 - DIGITAL ELECTRONICS AND DESIGN

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Determine the values of A,B,C and D that makes the sum term A'+B+C'+D equal to zero CO1- U

   (a) A=1,B=0,C=0,D=0 (b) A=1,B=0,C=1.D=0

   (c) A=0,B=1,C=0,D=0 (d) A=1,B=0,C=1,D=1

2. Before an SOP implementation, the expression X=AB(C'D+EF) would require a total of how many gates? CO2- R

   (a) 1 (b) 2 (c) 4 (d) 5

3. How many Flip-Flops are in the 7475 IC? CO3- R

   (a) 1 (b) 2 (c) 4 (d) 8

4. The time sequence of inputs, outputs, and flip-flop states can be enumerated in a CO4- R

   (a) Transition table (b) Truth table (c) Characteristic table (d) None of these

5. The storage element for a static RAM is the_____. CO5-R

   (a) Diode (b) Resistor (c) Capacitor (d) Flip Flop

PART – B (5 x 3= 15 Marks)

6. State various laws of Boolean algebra CO1- Ana

7. What is binary decoder? CO2- R

8. Give the excitation table of SR Flip- Flop CO3- R

9.		Give the comparison between synchronous and asynchronous counters.	CO4- R	
10.		What is Read cycle time?	CO5- R	

PART – C (5 x 16= 80 Marks)

11.	(a)	Simplify the following expression using K-map method and Draw the logic diagram $F = \Sigma(3,6,7,8,10,12,14,17,19,20,21,24,25,27,31$	CO1- App	(16)
		Or		
	(b)	Minimize the given switching function using Quine McCluskey Method $F(A,B,C,D) = \Sigma(0,2,3,7,8,10,12,13)$	CO1- App	(16)
12.	(a)	Design a combinational circuits that converts 4 bit gray to BCD code converter and implement the circuit	CO2- App	(16)
		Or		
	(b)	Implement full subtractor using demultiplexer.	CO2- U	(16)
13.	(a)	Design an asynchronous BCD ripple counter using JK flip – flop.	CO3- App	(16)
		Or		
	(b)	Design a 3 bit Asynchronous Ripple counter using T Flip Flop and explain its operation.	CO3- App	(16)
14.	(a)	Design a asynchronous sequential circuit that has two inputs X and Y and one output Z. when Y=1, input X is transferred to Z. when Y=0,the output does not change for any change in X.	CO4- Ana	(16)
		Or		
	(b)	What is meant by Hazards? Explain the different types of Hazards. Design a hazard free circuit for y= $\Sigma m(0,2,6,7,8,10,12)$.	CO4- Ana	(16)
15.	(a)	Design using PLA the following functions 1. $X(A, B, C) = \Sigma(0,1,2,4)$. 2. $Y(A, B, C) = \Sigma(0,5,6,7)$.	CO5- App	(16)
		Or		
	(b)	Write a note on types of ROMs and ROM organization.	CO5- App	(16)