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Question Paper Code: 53402

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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)

- 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
- 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
- How many Flip-Flops are in the 7475 IC? CO3- R
(a) 1 (b) 2 (c) 4 (d) 8
- 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
- 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)

- State various laws of Boolean algebra CO1- Ana
- What is binary decoder? CO2- R
- 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)