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Question Paper Code: 93303

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

Third Semester

Computer Science Engineering

19UCS303 – Digital Electronics

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

- Which of the following expressions is in the product of sum (POS) form? CO1- U
(a) $(A + B)(C + D)$ (b) $(A)B(CD)$ (c) $AB(CD)$ (d) $AB + CD$
- Infer the Boolean expression of borrow in half-subtract or CO1- U
(a) AB' (b) $A'B$ (c) AB (d) $A'B'$
- Show the input value for S and R whether it is Reset state. CO1- U
(a) 00 (b) 01 (c) 10 (d) 11
- Which is not belong to the categories of hazard. CO1- U
(a) Static (b) Dynamic (c) Static-1 (d) Static-9
- CMOS technology is used in _____ CO1- R
(a) Inverter (b) Microprocessor
(c) Digital logic (d) Both microprocessor and digital logic

PART – B (5 x 3= 15 Marks)

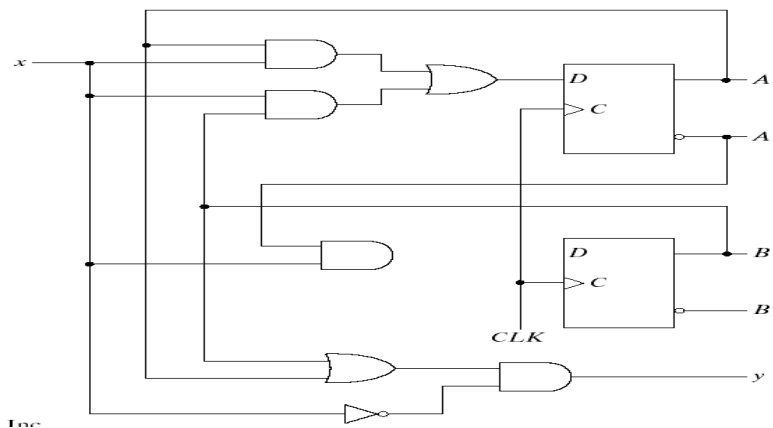
- Express $x + yz$ in standard form CO2- App
- Design circuit to detect invalid BCD number CO1- U
- Differentiate Moore and Mealy state machine CO1- U
- Explain the steps involved in state reduction CO1- U
- Differentiate PLA and PAL CO1- U

PART – C (5 x 16= 80Marks)

11. (a) (i) Using a K-Map simplify $F = (0-3, 12-15) + d(7, 11)$ CO2- App (8)
 (ii) Simplify the expression using k-map CO2- App (8)
 $F(W,X,Y,Z) = (1,4,6,7,8,9,10,11,15)$
 Or
 (b) Simplify the following using the Quine – Mc Clusky minimization CO2- App (16)
 technique $f(a,b,c,d) = (0,1,2,3,6,7,8,9,14,15)$.

12. (a) Design about 2 bit magnitude comparator CO2- App (16)
 Or
 (b) Elaborate about half subtractor and how full subtractor can be CO1- U (16)
 implemented using 2 half adders with the necessary truth table and
 equation

13. (a) Construct the transition table, state table and state diagram for the CO2- App (16)
 moore sequential circuit given below



- Or
 (b) Explain different types of shift registers in detail with the necessary CO3- App (16)
 diagram
 14. (a) Find whether static ‘O’ hazard does not exist in implementing the CO2- App (16)
 Boolean expression: $Y = x_1 x_3 + x_1 x_2 x_3 + x_2' x_3$. If exists, then find
 the static hazards present
 Or
 (b) Design a asynchronous sequential circuit with 2 inputs T and C. The CO2- App (16)
 output attains a value of 1 when $T = 1$ & c moves from 1 to 0.
 Otherwise the output is 0.

15. (a) Implement the switching functions. CO2- App (16)

$$Z1=ab'd'e+a'b'c'd'e'+bc+de$$

$$Z2=a'c'e$$

$$Z3=bc+de+c'd'e'+bd$$

$$Z4=a'c'e+ce \text{ using } 5 \times 8 \times 4 \text{ PLA}$$

Or

- (b) Design a combinational circuit using ROM that accepts a three bit binary number and outputs a binary number equal to the square of the input number. CO2- App (16)

