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Code No.: 21114 S

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. II Year (C.S.E.) I-Semester Supplementary Examinations, May/June-2017

Logic and Switching Theory

Time: 3 hours

Max. Marks: 70

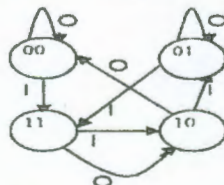
Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 X 2=20 Marks)

- Convert $(634)_8$ to binary.
- Given the two binary numbers $X = 1010100$ and $Y = 1000011$, perform the subtraction (i) $X - Y$ and (ii) $Y - X$ using 1's complements.
- Implement the following Boolean function with NAND-NAND logic $F = \sum m(0,1, 3, 5)$.
- Give the classification of logic families.
- Design Half – adder using only NOR gates.
- Write the design procedure for combinational circuits.
- Write the excitation tables of JK and D flip flops.
- What is race-around condition in a flip flop?
- Draw the state diagram of MOD -10 counter.
- Differentiate between ripple counters and synchronous counters.

Part-B (5 × 10 = 50 Marks)

- a) Construct an even parity seven bit code to transmit the data i)1010 ii)1110 [4]
b) Show the truth table for each of the following functions and find its simplest POS form. [6]
i) $f(x,y,z) = xy+xz$ ii) $f(x,y,z) = x'+yz'$
- a) Minimize the following expression using Tabulation procedure [5]
 $F(A,B,C,D) = \sum m(0,4,8,10,12,13,15) + d(1,2)$.
b) Implement the following Boolean expression by OR-AND 2 level logic circuit. [5]
 $F(x,y,z) = ((x+y').z)+(x'yz')$
- a) Design odd parity checker and generator circuits. [4]
b) Implement the following function using suitable multiplexer $F(A, B, C, D) = \sum(1, 3, 4, 11, 12, 13, 14, 15)$ [6]
- a) Draw the state diagram of a circuit that recognizes the sequence 1011. [4]
b) Realize the circuit given in the following state diagram using JK Flip Flops. [6]



- a) What is universal shift register? Explain its operation. [5]
b) Design a 3-bit binary counter using T FF that has a repeated sequence of 6 states: 000-001-010-011-100-101-110. Give the state table, state diagram & logic diagram. [5]
- a) Implement the given Boolean function using 8 : 1 multiplexer $F(x,y,z) = \sum(1, 3, 5, 6)$. [5]
b) Reduce the following function using K-map technique $f(w, x, y, z) = \pi(0, 3, 4, 7, 8, 10, 12, 14) + d(2, 6)$. [5]
- Answer any two of the following:
a) Explain the working of carry look ahead adder circuit. [5]
b) Differentiate Moore and Mealy machines with block diagram. [5]
c) Draw the logic diagram of 3 bit binary up /down synchronous counter and explain with truth table. [5]
