Tribhuvan University

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

2019

Bachelor in Computer Applications **Full Marks: 60**
Course Title: Digital Logic **Pass Marks: 24**
Code No: CACS 105 **Time: 3 hours**
Semester: 1st

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Subtract: 1010.110 – 101.101 using both 2's and 1's complement. [5]
3. Simplify (Using k-map) the given Boolean function in both SOP and POS using the don't care condition d:

   $$F(A,B,C,D) = \pi(0,1,3,7,8,12) and\ \pi d(5,10,13,14)$$ [2 + 3]

4. Define decoder. Draw logic diagram and truth table of 3 to 8-line decoder. [1 + 4]
5. Define ROM. Implement the following combinational logic function using ROM: [2 + 3]

A1	A0	F1	F2
0	0	1	0
0	1	0	1
1	0	1	1
1	1	1	0

6. What are the drawbacks of clocked RS flip flop? Explain the operation of JK Flip flop along with its circuit diagram and characteristic table. [2+3]
7. What is T flip-flop? Explain clocked JK flip-flop with its logic diagram and truth table. [1 + 4]

8. Design MOD - 7 counter with state and timing diagram. [2 + 1 + 2]

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Define PLA. Design a PLA circuit with given functions.

   F1 (A, B, C) = Σ (3, 5, 6, 7)

   F2 (A, B, C) = Σ (0, 2, 4, 7). Design PLA program table also. [3 + 7]

10. Distinguish between sequential and combinational logic with example? Discuss the design procedure of combinational logic. [4+6]

11. A sequential circuit with two D flip-flops, A and B, two inputs x and y, and one output z, is specified by the following next state and output equations [4+3+3]

    $A(t+1) = x'y + x A$

    $B(t+1) = x'B + x A$

    $z = B$

    a) Draw the logic diagram.

    b) Derive the state table.

    c) Derive the state diagram.