

CACS 105-2019

Tribhuvan University
Faculty of Humanities and Social Sciences
Office of the Dean
2019

Bachelor in Computer Application
Course Title: Digital Logic
Code no: CACS 105
Semester: I

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Group B

Attempt any SIX questions.

[6x5 = 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:
 $F(A, B, C, D) = \Omega(0,1,3,7,8,12)$ and $\Omega_d(5,10,13,14)$ [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 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.

[2x10=20]

9. Design a PIA circuit with given functions. $F1(A, B, C) = \Sigma (3, 5, 6, 7)$

$F2(A, B, C) = \Sigma (0, 2, 4, 7)$. Design PLA programs 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]

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

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

$$z = B$$

- a. Draw the logic diagram.
- b. Derive the state table.
- c. Derive the state diagram.