



TRIBHUVAN UNIVERSITY

2022

Bachelors in Computer Applications

Course Title: Digital Logics

Full marks: 60

Course Code No: CAEN 103

Pass Marks: 24

Semester: I

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

Group A

Attempt Any SIX Question. (6*5)=10

1. Subtract: 11101.11110100.101 using both 1's and 2's complement.
2. Simplify given Boolean function in both SOP and POS using k-map where d represents don't care condition. $F(A, B, C, D) = \prod (0, 1, 3, 7, 8, 12)$ and $\prod d(5, 10, 13, 14)$
3. Define combinational circuit. Write a combinational circuit design procedure. Design a half adder with its truth table, logic diagram and Boolean expression.
4. Define Priority encoder. Design 4:2 priority encoder with its block diagram, truth table, circuit diagram and mathematical expression.
5. Why NAND and NOR gates are called universal gates? Realize NAND gate as universal gate.
6. What is race around condition? Explain how JK master flip flop is used to eliminate race around condition.
7. Differentiate between synchronous and ripple counter. Design mod 7 ripple counter with its state diagram, sequence table, logic diagram and timing diagram.

Group C

Attempt any TWO questions.

8. What is register? Explain types of registers depending on input output with its block diagram & logic diagram.
9. What is state diagram? A sequential circuit with two D flip-flops A and B, one input x and one output z is specified by the following next state and output equations:
10. $A(t+1) = A' + B$, $B(t+1) = B'x$, $z = A + B'$
 - i) Draw the logic diagram of the circuit
 - ii) Draw the state table
 - iii) Draw the state diagram