# Tribhuvan University

**Faculty of Humanities and Social Sciences**

**OFFICE OF THE DEAN**

**2018**

**BCA First Semester**

**Subject: Digital Logic** **Full Marks:60**

**Time: 3hr** **Pass Marks: 24**

## Group B

**Attempt any SIX questions. [6x5=30]**

11.Subtract: 675.6 – 456.4 using both 10's and 9's complement.[5]

12.What is universal logic gate? Realize NAND and NOR as an universal logic gates. [1+2+2]

13. Simplify (using K- map) the given Boolean function F in both SOP and POS using don't care conditions D: B'CD' + A'BC'D F=B'C'D' + BCD' + ABCD' [2+3]

14.Define encoder: Draw logic diagram and truth table of octal - to - binary encoder. [1 + 4]

15.What is D flip-flop? Explain clocked RS flip-flop with its logic diagram and truth table.[1+4]

16.Design MOD - 5 counter with state and timing diagram.[2+1+2]

17. Design a 4 - bit serial into parallel- out shift register with timing diagram. [3+2]

## Group C

**Attempt any TWO questions.[2x10=20]**

18. Write difference between PLA and PAL. Design a PLA circuit with given functions.

F1 (A, B, C)=Σ (2, 3, 5)

F2 (A, B, C)=Σ (0, 4, 5, 7).

Design PLA program table also.[3+7]

19.Define D flip-flop. Design a Master-slave flip-flop by using JK flip-flop along with its circuit diagram and truth table. [2+8]

20.Write down the difference between asynchronous and synchronous counter. Design a 4-bit binary ripple counter along with its circuit, state and timing diagram. [3+7]

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**2019**

**BCA First Semester**

**Subject: Digital Logic** **Full Marks:60**

**Time: 3hr** **Pass Marks: 24**

## Group B

**Attempt any Six question**

2. Subtract: 1010.110 - 101.101 using both 2's and 1's complement.

3. Simplify (using k-map) the given Boolean unction in both SOP and POS using the don't case condition d: f(A,B,C,D)=π(0,1,3,7,8,12) πd (5,10,13,14)

4. Define decoder. Draw logic diagram and truth table of 3 to 8-line decoder.

5. Define ROM. Implement the following combinational logic function using ROM:

| 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 Flipflop along with its circuit diagram and characteristic table.

7. What is T-Flip Flop? Explain clocked JK Flip-Flop with its logic diagram and truth table.

8. Design MOD-7 counter with state and timing diagram

## Group C

**Attempt any Two question**

9. Define PLA. Design PLA circuit with given funtion.

F1(A,B,C)=Σ (3,5,6,7)

F2(A,B,C)=Σ (0,2,4,7).

Design PLA Program table also

10. Distinguish between sequential and combinational logic with example? Discuss the design procedure of combinational logic.

11. A sequential circuit with two D flip flops, A and B, two inputs x and y, and one output z, us specified by the following next state and output equations.

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.

# Tribhuvan University

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**2020**

**BCA First Semester**

**Subject: Digital Logic** **Full Marks:60**

**Time: 3hr** **Pass Marks: 24**

## Group B

**Attempt any SIX questions. [6x5 = 30]**

2. Define Digital Logic. Explain digital signal with its applications, advantages and disadvantages. [1 + 4]

3. Define positional number System [1] calculate following: [2+2]

a) Subtract 21 from 35 using 2's complement method. b) Convert $(62.75)_{10}$ into single precision floating point format [2]

4. Define universal gate. Explain Universal gates with their graphical symbol, algebraic expression, truth table, and Venn diagram [1 + 4]

5. Define Decoder. Explain binary to octal converter with block diagram, truth table and logic diagram[1 + 4]

6. Simplify the Boolean function F(w,x,y,z) = $\pi$(0,2,4,6,8,10,12,14) and don't care conditions d(w,x,y,z) = $\pi$(1,3,9,11) using K-Map method for both SOP and POS form [2.5 + 2.5]

7. Degine Multiplexer. Explain 4:1 multiplexer with its block diagram, truth table and logic diagram [1 + 4]

8. Write short Notes on (any Two): [2.5 + 2.5]

a) Parallel Adder b) PLA c) State Diagram

## Group C

**Attempt any TWO Questions**

9. Explain JK and T FlipFlop with their Logic and Diagram, grapical symbol, characteristic table, characteristic equation and excitation table. [5 + 5]

10. Differentiate between asynchronous and synchronous sequential circuits with example. Draw a block diagram, truth table and timing diagram to store 2001 in 4-bit SIPO register. [4 + 6]

11. Define counter. Write a procedure to design a counter circuit. Design MOD-8 up counter [1 + 2 + 7]