

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2080 Baishakh

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

Subject: - Digital Logic (EX 401)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. What is importance of coding? Explain about ASCII code briefly. [1+2]
2. Convert the following number system. [1.5×4]
 - a) $(101101.011)_2 = (?)_{10}$
 - b) $(110111)_{\text{gray}} = (?)_2$
 - c) $(524)_8 = (?)_{16}$
 - d) $(125.25)_{10} = (?)_2$
3. Describe positive and negative logic with an example. Construct Ex-NOR gate using only NOR gates. [2+3]
4. Simplify the following expression using K-map. Expression it in SOP format and realize it using NAND gate only. [4+2]

$Y = F(M, N, O, P) = \sum m(0, 1, 2, 8, 12, 14, 15) + d(5, 10, 11)$
5. Realize a full-adder circuit using a single 1:4 demultiplexer and logic gates. [5]
6. What is a priority encoder? Find out logic expressions and draw the logic circuit of 4 to 2 priority encoder. [2+4]
7. How can we use flip-flop as a state machine? Convert SR flip-flop to JK flip-flop. [2+5]
8. Differentiate between combinational and sequential logic circuits. Explain the operation of a synchronous decade counter with timing diagrams. [2+6]
9. Describe the logic operation of 4-bit parallel-in serial out shift register with timing diagram of 1011 input data. [6]
10. Design a synchronous mod-5 up-counter using SR flip-flops and draw its timing diagram. [6+2]
11. Design a synchronous machine which has one input, x and one output, z. The output is required to give high when input contains 110 serial message. Implement only JK flip-flops. [10]
12. What is a ROM? Explain it how one bit memory is stored as '1' or '0', based on BJT circuit. [2+4]
13. With the help of block diagram explain the operation of multiplexing display circuit. [4]
