# TRIBHUVAN UNIVERSITY <br> FACULTY OF MANAGEMENT Office of the Dean <br> 2010 

Full Marks: 40
Time: 2 hrs.

## BIM/ First Semester/ITC 212: Digital Logic

Candidates are required to answer the questions in their own words as far as practicable Group 'A'

## Attempt All questions:

## Brief Answer Questions:

$[10 \times 1=10]$

1. Convert $(67.51)_{8}$ to hexadecimal.
2. Write one advantage of alphanumeric code from other codes.
3. Why k-map is suggested only for limited number of variables?
4. Draw a circuit diagram to count 6 different numbers using Johnson counter.
5. Simplify: $\mathrm{AB}+\mathrm{A}^{\prime} \mathrm{B}^{\prime}+\mathrm{ABC}^{\prime} \mathrm{D}^{\prime}+\mathrm{A}^{\prime} \mathrm{B}$
6. Write one application area of ECL and CMOS each.
7. A memory contains 1696 distinct cell; which is organized in such a fashion that 32 bit data can be Read/Write once. Find out the input and output of address decoder.
8. Why is PLA better than PAL?
9. How many flip flops are required to generate a 7 Hz pulse from 56 Hz pulse?
10. What is the minimum number of inverters required to find the 2 's complement of $(10110000)_{2}$ ?

## Group 'B'

Short Answer Questions:
$[5 \times 4=20]$
11. a. If $A=37$ and $B=-18$, then calculate $B-A$ using 2 's Complement concept.
b. Write two advantages of Analog and Digital technology each.
12. Differentiate between $T$ and $D$ flip-flop along with its truth table and circuit diagram.
13. Draw a circuit diagram to display $A, B, C, D, E$ and $F$ in seven segment display.
14. You are provided with a bit sequence 1101 to operate with serial in parallel out register. Draw the circuit diagram and functional table to illustrate the procedure to store and retrieve those bits.
15. Design an asynchronous MOD-88 counter.

## Group 'C'

Long Answer Questions:
[ $2 \times 5=10]$
16. Minimize the given expression using k-map and draw the logic diagram using minimum number of NAND gate only.
$\mathbf{A B C}+\mathbf{B C} \mathbf{C} \mathbf{D}+\mathbf{C} \mathbf{D}^{\prime}+\mathbf{A B} \mathbf{B}^{\prime}+\mathbf{A}^{\prime} \mathbf{B C D}+\mathbf{A}^{\prime} \mathbf{B}^{\prime} \mathbf{C}^{\prime} \mathbf{D}^{\prime}$
17. Design a synchronous sequential circuit using $T$ flip flop with one input $A$ and an output $B$. The input $A$ is a serial message and the system reads $A$ one bit at time. The output $B=1$ whenever the pattern 101 is encountered in the serial message.
For example:
if input: 0101011101
then output :0001010001

