Student Exam No: _____

GANPAT UNIVERSITY

B.Tech Sem. IVth Biomedical & InstrumentationEngineering

Regular Exam May / June-2013

2BM 403: Digital Logic Circuits

Time: 3 Hours **Total Marks-70**

Instructions:-

1. **All the questions are compulsory.**
2. **Answer of each section must be written in separate answer books.**
3. **Figure to the right indicate marks.**
4. **Assume data, if needed.**
5. **Conventional terms / notations are used.**

Section – I

Que.1 **[12]**

a) Define: Digital, Analog, Bit, Byte, Nibble.
Compare analog and digital.

b) Convert:
1. $(101001010.1101)_2 = (\_\_\_\_)_{10}$
2. $(415)_8 = (\_\_\_\_)_{10}$
3. $(734)_{10} = (\_\_\_\_)_8$

OR

Que.1. **[12]**

a) What is Boolean Algebra? Name the methods to reduce Boolean expression.
Explain principle of Boolean Algebra with necessary diagrams.

b) Reduce using K-map:
1. $f = \sum m(0,2,6,10,11,12,13) + d(3,4,5,14,15)$
2. $f = \prod M(2,7,8,9,10,12)$

Que.2. **[11]**

a) State and prove basic laws of Boolean Algebra.

b) Find minterm: $Y(A,B) = A'+B'$
Find Maxterm: $Y(A,B) = A(B'+A)B$

OR

Que.2 **[11]**

a) DeMorganize: $Y(A,B) = (A+B)'.(A'+B')'$

b) Reduce : $f = A+B[AC + (B+C')D]$

Que.3. **[12]**

a) Reduce using Tabular method: $f = \sum m(0,1,6,7,8,9,13,14,15)$

b) Realize an explain AND logic gate using DIODE LOGIC and TRANSISTOR LOGIC.

c) Difference between Combinational Logic Circuit and Sequential Logic Circuit.

Section – II

Que-4

a) Design Half and Full Adder circuits with necessary logic diagrams. [12]

b) Design 2-bit comparator.

OR

Que-4

a) Design a full adder using demultiplexer. [12]

b) What is Sequential Circuit? Name types of Sequential Circuits and difference between them.

Que-5

a) Draw and explain clocked S-R flip-flop with truth table. [11]

b) Name types of counter. Explain ring counter with necessary diagrams. Write limitation of it.

OR

Que-5

a) Draw and explain Master Slave J-K flip-flop. [11]

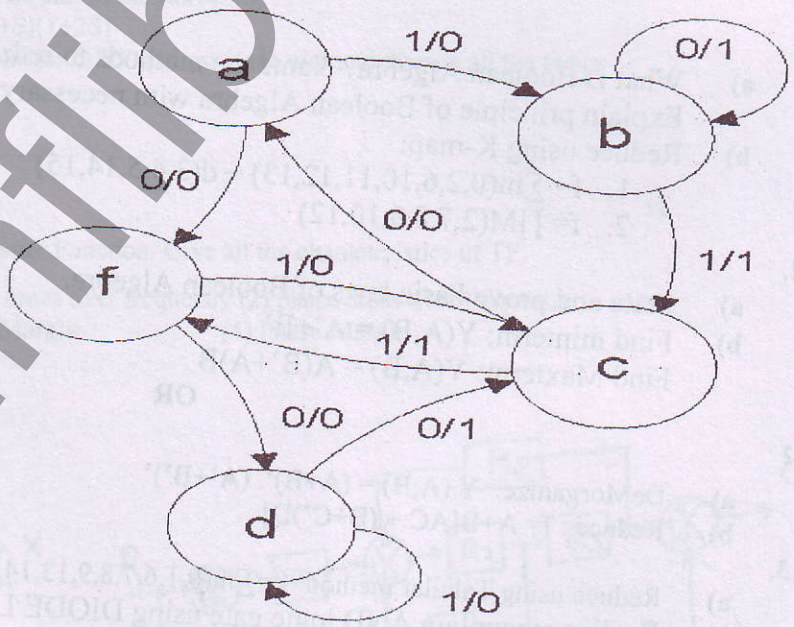
b) Define: Shift Register. Give types of Shift Register. Explain any one of it.

Que-6

a) What is flip-flop? Explain characteristics of flip-flop. [12]

b) Explain flash type ADC.

c)



Design state table for the above state diagram. Use state reduction technique if possible.

'END OF PAPER'