Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-III Examination May 2012

Subject code: 130701

Subject Name: Digital Logic Design

Date: 09/05/2012 **Time: 02.30 pm – 05.00 pm**

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1

(a) Convert the Decimal Number 250.5 to base 3, base 4, base 7 & base 16. **04**

(b) Given Boolean function **05**

F= x y + x′ y′ + y′ z

1. Implement it with only OR & NOT gates
2. Implement it with only AND & NOT gates

(c) Design the Combinational Circuits for Binary to Gray Code Conversion. **05**

Q.2

(a) Determine the Prime Implicants of following Boolean Function using Tabulation Method. **07**

F(A,B,C,D,E,F,G)=∑(20,28,38,39,52,60,102,103,127)

(b) Explain Design Procedure for Combinational Circuit & Difference between Combinational Circuit & Sequential Circuit. **04**

(c) Express following Function in Product of Maxterms **03**

F(x,y,z)= (xy + z) (y + xz)

Q.3

(a) Construct 4*16 Decoder with help of 2*4 Decoder. **05**

(b) Discuss 4 bit BCD Adder in Detain. **05**

(c) Explain Master Slave Flip Flop through J.K Flip Flop **04**

OR

Q.3

(a) Design Sequential Circuit with J.K. Flip Flops to satisfy the following state equation. **07**

A(t + 1) =A′ B′ CD + A′ B′ C + ACD +AC′ D′

B(t+1)= A′ C + CD′ + A′ BC′

C(t + 1) = B

D(t +1)=D′

(b) Explain 4 bit Magnitude Comparator. **07**

Q.4

(a) Explain 4bit binary ripple counter. **07**

(b) Explain Arithmetic addition and arithmetic subtraction. **04**

(c) Brifley explain processor unit with a 2-port memory **03**

P.T.O.

OR

Q.4

(a) Define the different mode of operation of registers & explain any two in details. **07**

(b) How many flip flops are required to build a shift register to store following numbers. **04**

i) Decimal 28
ii) Binary 6 bits
iii) Octal 17
iv)Hexadecimals A

(c) Explain Macro operations Versus micro operations **03**

Q.5

(a) Explain 4-bit up-down binary synchronous counter. **07**

(b) Explain comman cathode types seven segments displays. **03**

(c) Simplify the following Boolean function using K-Map. **04**

F=A′B′C′+B′CD′+A′BCD′+AB′C′

OR

Q.5

(a) Explain Johnson Counters. **07**

(b) Write the Comparisons between Hard wired control and micro programmed Controls. **03**

(c) Design a combination circuits for a full adder. **04**

========== Best of Luck ==========

P.T.O.