	Utech
Name:	
Roll No.:	To the man by Exemple of State of
Invigilator's Signature :	

CS/M.Tech(ECE)/SEM-1/MVLSI-103/2012-13 2012

DIGITAL IC DESIGN

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A (Objective Type Questions)

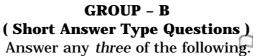
1. Answer any five of following:

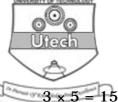
- $5 \times 2 = 10$
- a) Draw the layout of 2 input and gate.
- b) Draw a 1 bit full adder using dynamic logic.
- c) Write the program of master slave flip-flop using VHDL.
- d) What is bootstrap capacitance?
- e) Draw the symbols of inverter, AND, OR, XOR gates in BDD.
- f) How the following Boolean function can be realized with TG.

$$F = A + BC$$

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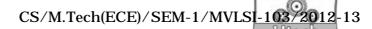
- 2. Describe the operation (Read and write) of 1bit SRAM Cell.
- 3. Write the program of parity generator using VHDL code.
- 4. What are the rules for layout ? Draw the layout for 1bit full adder.
- 5. Draw the circuit diagram of a dynamic shift register with enhancement load and explain its operation.
- 6. Design the state diagram for handshaking mechanism of a communication system.

GROUP - C (Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 7. a) How many types of VHDL programming are there?
 - b) Design a seven segment display to glow 2012 and write down its program in VHDL. 5 + (5 + 5)
- 8. a) What is logic optimization? Why is it needed?
 - b) Design a mod 10 counter using an optimized logic method and justify your chosen method.

$$(4+2)+(7+2)$$



- 9. a) What is cascading problem in dynamic CMOS logic ?
 How is this problem removed ?
 - b) Design the following function using Domino logic :

$$F1 = A' + BCD + D'$$

 $F2 = DE' + (A + C' G + HF1)'$
 $F3 = (IJK' + (F1' F2)' + AB'C)$ (3 + 3) + 9

- 10. a) Draw the layout for 2bit full adder.
 - b) Descibe read and write operations of a DRAM cell.

$$9 + (3 + 3)$$

- 11. a) Design the ROBDD of 4 bit full adder.
 - b) Explain with illustrations Moore's and Mealy machines.

$$9 + (3 + 3)$$

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