

Examination May-2014

**DIGITAL CIRCUIT AND LOGIC DESIGN (CS-205)**

Paper ID-A0453

**Time : 03 Hours****Maximum Marks: 60****Instruction to Candidates:**

- 1) Section A is compulsory.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

**Section A****(10 \* 2 = 20)**

Q1)

- a) Differentiate between synchronous and asynchronous sequential circuits.
- b) How do Multiplexer differs from Encoder?
- c) Convert:  $(154.514)_{10} = ( )_8$ .
- d) Subtract -24 from 65 using 2's complement.
- e) What is meant by resolution of an D/A convertor?
- f) Realize AND gate using NOR gates only.
- g) What is custom and semi-custom design?
- h) Outline two major applications of multi-vibrators?
- i) A preset able counter has sixteen flip-flops. If the preset number is 125, what is the modulus?
- j) What is the minimum voltage value that is considered as high stage input for TTL logic family?

**Section B****(4 \* 5 = 20)****Q2) Draw the logic symbol and construct the truth table for each of the following gates:**

- a. Three input NAND gate
- b. Two input OR gate
- c. Three input EX-NOR gate

- Q3) What is a Decoder? Compare a decoder and a Demultiplexer with suitable block diagrams.
- Q4) Differentiate between static MOS and Dynamic MOS RAM. Explain the working of a static MOS RAM cell with the help of a circuit diagram.
- Q5) State and prove De-Morgan's Theorem for two variables.
- Q6) Why interfacing is required for digital ICs? List out the major considerations while interfacing TTL gate and CMOS gate.

### Section C

(2 \* 10 = 20)

- Q7) Write out the minimized Boolean Algebra Expression for each of the Karnaugh maps below. Also, Construct Truth tables for each of the maps.

cd \ ab	00	01	11	10
00	1		1	1
01	1			1
11				
10			1	

cd \ ab	00	01	11	10
00	1	1		
01				
11	1			1
10	1	1		1

cd \ ab	00	01	11	10
00	1			1
01				
11				
10	1			1

- Q8) Discuss the various semiconductor memories with their corresponding applications.
- Q9) Write short notes on:
- (a) VLSI Design
  - (b) Bus Structures