

**MCA-02**

MCA Examination June - 2015

**Digital Logic****MCA-02***Time : Three Hours]**[Max. Marks : 80*

**Note:** The Question paper is divided into three sections A, B and C. Write Answers as per given instructions.

**Section-A**

(Very Short Answer Questions)

(Marks:  $8 \times 2 = 16$ )

**Note :** Answer all questions. As per the nature of the question delimit answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

1.
  - (i) What do you mean by latch?
  - (ii) What is the full form of ASCII?
  - (iii) Define Base or Radix of a number system.
  - (iv) Explain any two properties of Boolean algebra.
  - (v) What is a comparator?
  - (vi) Define the term triggering.
  - (vii) What is register?
  - (viii) Define minterm and maxterm.

**Section-B**

(Short Answer Questions)

(Marks:  $4 \times 8 = 32$ )

MCA-02 / 200 / 2

(1)

**Note:** Answer any four questions. Each Answer should not exceed 200 words. Each question carries 8 marks.

2. State and prove De Morgan's Theorem.
3. Difference between combinational and sequential circuits.
4. Explain the working of tri state TTL NAND GATE.
5. Draw the logic diagram of an XOR gate using NAND gates.
6. Compare Synchronous and Asynchronous Counters.
7. Simplify the Bollen Expression using K-map :  
 $F=A'B'C'+B'CD'+A'BCD'+ABC'$
8. Write short notes on :
  - (a) The principle of Duality
  - (b) Sum of Product and Product of Sum
9. Discuss the method of conversion from binary to Gray code and vice-versa with example.

### Section-C

(Long Answer Questions)

(Marks:  $2 \times 16 = 32$ )

**Note :** Answer any two questions. You have to delimit your each answer maximum upto 500 words. Each question carries 16 marks.

10. Implement the following function using 16:1 multiplexer f(A,B,C,D) =  $\Sigma m(0,1,3,4,6,8,10,11,12,15)$ .
11. What do you understand by race round condition? How it's overcome in master-slave J-K flip-flop?
12. What do you mean by magnitude comparator? Draw and explain block diagram and function table of it.
13. What is Random Access Memory? Give the detail classification of Random Access Memory.

—x—

(2)