Roll No. .....

Subject Code—6800

M.C.A. (Second Year) EXAMINATION

(5 Years Integrated Course (D.E.)

(Main Batch 2009)

DIGITAL ELECTRONICS

MCA-203

Time : 3 Hours *Maximum Marks : 70*

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) Realise AND gate and OR gates with the help of NAND gates only.

   (b) Realise EX-OR gate with the help of four NAND gates only.

   (c) State and prove deMorgan's theorem.

2. (a) Explain the process of converting the following :

(i) Octal to Binary

(ii) Decimal to Octal

(iii) Hexadecimal to Binary.

(b) Explain the process for signed number addition and subtraction.

(c) What are error codes ? Explain.

3. (a) What are Min Terms and Max Terms ?

(b) Draw and explain the circuit for Full Adder.

(c) What is Don't Case Condition ?

4. (a) Design a Gray to Binary Code converter.

(b) Realize using NAND gates only :

$$f(A, B, C, D) = \Sigma (1, 2, 3, 5, 9, 11, 13) + d (4, 8, 12)$$

5. (a) Convert S.R. flip flop to J.K. flip flop using design methodology.

(b) What is Race Around Condition ? How can it be rectified ?

6. (a) Explain how Universal Shift Register works.

   (b) Explain the working of Bidirectional Shift Register.

7. (a) Design a MOD-7 counter.

   (b) Differentiate between Ripple and Synchronous Counter.

8. Write short notes on the following :

   (a) TTL NAND Gate

   (b) Characteristics of Digital IC's.