Roll No. .....

Subject Code—6746-X

P.G.D.C.A./M.C.A. EXAMINATION

(MCA 3 Years)

(First Semester)

(Re-appear Batch of 2009)

MS-03

DIGITAL ELECTRONICS

Time : 3 *Hours* *Maximum Marks :* 70

Note : Attempt any *Five* questions out of given eight.

1. (a) What are basic and universal gates ? Realise all the basic gates with switch and lamp logic.

   (b) State and prove De Morgan's law. Implement the same using NAND gates only.

2. (a) Realise 16 : 1 multiplexer using 4, 4 : 1 multiplexers.

(b) Differentiate between demultiplexer and decoder and multiplexer and encoder.

3. (a) Draw circuit for BCD adder.

(b) What is race around condition and how is it removed ?

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

(b) Draw and explain the working of TTL NAND gate.

5. (a) Realise NAND gate with the help of MOS logic.

(b) Draw and explain tristate buffer.

(c) What is toggling ? How can it be removed ?

6. (a) Differentiate between synchronous and asynchronous counters.

(b) Explain the working of Bidirectional Shift Register.

7. (a) Realise with the help of NAND gates only :

$f(A, B, C, D) = \sum(1, 3, 5, 7, 9, 11, 13, 15) + d(0, 6, 8)$

(b) Explain the concept of RAM and ROM Cells and their organisation.

8. Write short notes on the following :

(a) A/D Converter (any *one*)

(b) D/A converter (any *one*).