Roll No. .....

BM/CS/EI–303(N)

B. E. (Third Semester) EXAMINATION, June, 2010

(New Scheme)

(Common for BM, CS & EI Engg. Branch)

DIGITAL CIRCUITS AND SYSTEMS

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

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

1. (a) Convert the following :

   (i) $(B65\,F)_{16} = (\ )_{10}$

   (ii) $(153 \cdot 25)_{10} = (\ )_2$

   (iii) $(10110001101011)_2 = (\ )_8$

   (iv) $(153)_{10} = (\ )_8$

   (b) State and prove De Morgan's theorem.

2. (a) Simplify the following Boolean function with K-map :
   $F(W, X, Y, Z) = \Sigma\ (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

   (b) Simplify the following using Quine and McCluskey's method :
   $F(W, X, Y, Z) = \Sigma\ (0, 1, 2, 8, 10, 11, 14, 15)$

P. T. O.

3. (a) Design a full adder with the help of truth table. Explain the working of full adder by giving expressions for sum and carry in full adder.

   (b) Design a full subtractor using two half subtractor and an OR gate.

4. (a) Design a BCD adder and also give the rules of BCD addition.

   (b) Explain the working of Look-ahead carry generator.

5. (a) Explain the working of monostable multivibrators with the help of waveforms and circuit diagram.

   (b) Give a comparison of the following logic families : DTL, RTL and TTL.

6. (a) Design a 3 to 8 line decoder.

   (b) Explain the working of multiplexer and draw the detailed circuit of 4 to 1 line multiplexer.

7. (a) Design a 4 bit up-down binary counter.

   (b) Draw the circuit diagram of analog to digital converter and explain its working.

8. Write short notes on any *two* of the following :

   (i) Sample and hold circuit

   (ii) V-F converter

   (iii) Shift register

   (iv) Code converter

   (v) Schmitt trigger circuit