Roll No .....

EC - 403

B.E. IV Semester Examination, December 2014

Digital Electronics

Time : Three Hours ***Maximum Marks : 70***

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each questions are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Convert the following: i) $(3906)_{10} = (\quad)_{BCD}$ ii) $(370)_8 = (\quad)_{16}$
   b) State Demorgan's theorems.
   c) Write gray code and BCD code for $(18)_{10}$.
   d) What do you mean by Karnaugh's map? Reduce the following function using K-map technique.
   $F(A.B.C.D.) = \Sigma m(0, 7, 8, 9, 10, 12) + \Sigma d\ (2, 5, 13)$

   OR

   Simplify the following Boolean function by using a quine Mccluskey method.
   $F(A.B.C.D.) = \Sigma m\ (0, 2, 3, 6, 7, 8, 10, 12, 13)$.

2. a) What is meant by a combinational circuit?
   b) What are multiplexer and demultiplexer circuit?
   c) Explain working of full adder with block diagram.
   d) A combinational circuit is defined by the following two functions
   $F_1\ (x, y) = \Sigma\ (0, 3)$ $F_2(x, y) = \Sigma\ (1, 2, 3)$
   Implement the combinational circuits by means of the decoder and external gates.

   OR

   Draw the block diagram of BCD adder and explain its working.

3. a) What is meant by race around condition in flip-flop?
   b) What is a shift Registers? Mention some application of shift registers.
   c) Differentiate between synchronous and asynchronous counters.
   d) Explain the operation of Bistable multivibrator with the help of wave forms and its application.

   OR

   Explain design procedure for sequential circuit with suitable example.

4. a) Explain PLA in short.
   b) What are the different types of read only memories?
   c) What are the advantages of dynamic RAM over static RAM?
   d) Comparison between PROM, PLA and PAL.

   OR

   A memory is organized as i) 6K*8 and ii) 256K*4
   Calculate the number of bits stored at each location, the number of location required and total number of bit stored.

5. a) What is logic families?
   b) What is meant by open collector output of TTL gates?
   c) Define the following term i) Fan-in ii) Fan-out iii) Propagation delay
   d) Describe the basic operation of CMOS inverter circuit.

   OR

   Compare the characteristics of RTL, DTL, TTL, ECL, IIL.

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