Roll No .....

EX - 403

B.E. IV Semester

Examination, June 2014

Digital Electronics Logic Design - I

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 question 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.

Unit - I

1. a) Determine the decimal numbers represented by the following binary numbers.
   i) 1100.1011 ii) 1001.0101 2
   b) Convert the following octal number into equivalent decimal numbers.
   i) 237 ii) 0.75 2
   c) Explain basic theorems of Boolean Algebra. 3
   d) Given the logic equation
   $f = ABC + B\bar{C}D + \bar{A}BC$
   i) Make a truth table ii) Simplify using k-map
   iii) Realized using NAND gates. 7

   OR

   i) Why ASCII code is a 7 bit code.
   ii) Explain different logic gates with their graphical symbol, algebric function and truth table. 7

Unit - II

2. a) What is meant by a combinational circuit? 2

   b) Draw the circuit diagram for half adder? 2
   c) Explain working of full subtractor with block diagram. 3
   d) Draw the block diagram of BCD adder and explain its working. 7

   OR

   What is multiplexers? Design 4 to 1 line multiplexer with logic diagram and function table. 7

Unit - III

3. a) What is a flip-flop? How many flip-flops are required for storing n bit of information. 2
   b) What is meant by race around condition in flip-flop. 2
   c) What are the various methods used for triggering of flip-flops. 3
   d) Draw the circuit diagram of J-K flip flop and explain its working. What are limitation of JK flip flop. 7

   OR

   Explain design procedure for sequential circuit with suitable example. 7

Unit - IV

4. a) What is a shift register? Mention some application of shift register. 2
   b) Differentiate between synchronous and asynchronous counters. 2
   c) Draw the state diagram of a 3 bit binary counter. 3
   d) Explain the working of Johnson counter with suitable block diagram. 7

   OR

   Explain the operation of a 5 stage twisted ring counter. 7

Unit - V

5. a) What are the different types of read only memories. 2
   b) Explain PLA in short. 2
   c) What are the advantages of dynamic RAM over static RAM. 3
   d) List different methods of A/D conversion? Also explain successive approximation method in detail. 7

   OR

   Explain the following (any two) 7
   i) D/A converters, ii) PAL iii) RAM

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