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EE-504

B.E. V Semester

Examination, June 2016

Digital Electronics and Logic Design

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 FFF in Hex to binary octal and decimal numbers.
   b) Determine the decimal representation of a negative integer whose 8-bit two's complement code is 10010110.
   c) Where do we use ASCII, Excess-3and Grey codes?
   d) Perform the following operations:
      i) Subtract using 9's and 10's complement 34-14
      ii) Decimal number 102.5 to BCD and binary form.

OR

Hamming codes are a family of (n, k) block error-correcting code. Compute the hamming code for the given data bits 01101001.

2. a) Prove that AB + A'C + BC = AB + A'C
   b) Mention the important characteristics of digital IC's?
   c) Draw the logic circuit for the expression F = x'y'z + x'yz + xy'.

   d) Implement the expression Y(A, B, C) = ΠM(0, 2, 4, 5, 6) using only NOR-NOR logic.

OR

Draw and discuss the circuit of open collector TTT Not gate.

3. a) What is programmable logic array? How it differs from ROM?
   b) Convert the given expression in canonical SOP form Y = AC + AB + BC.
   c) Differentiate between the roles of MUX and DEMUX.
   d) Design an 8421 to gray code converter.

OR

Simplify the following Boolean functions by using K'Map in SOP and F (w, x, y, z) = m (1, 3, 4, 6, 9, 11, 12, 14)

4. a) Define race around condition.
   b) The t_{pd} for each flip-flop is 50ns. Determine the maximum operating frequency for MOD - 32 ripple counter.
   c) What is universal shift register?
   d) Realize D and T flip flops using Jk flip flops.

OR

Design a counter with the following repeated binary sequence : 0, 1, 2, 3, 4, 5, 6. use JK Flip-flop.

5. a) Define address and word.
   b) List the various types of A/D converters.
   c) What is meant by memory expansion? Mention its limit.
   d) Draw the circuit of a static MOS RAM cell and explain its operations of Read and Write.

OR

Draw the circuit of R-2R, 4 Bit D/A converter and discuss its conversion process.

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