Roll No .....

## **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-3 and 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 errorcorrecting 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?
  - 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)

- a) Define race around condition.
  - The t<sub>pd</sub> 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.

- 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.