

Roll No .....

**CS/EI - 303**

**B.E. III Semester**

Examination, June 2015

**Digital Circuit and System**

*Time : Three Hours*

*Maximum Marks : 70*

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- 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.

1. a) Convert the number  $(210.25)_{10}$  to base 2, 8.  
b) Convert 10111011 in binary into its equivalent gray code.  
c) Explain the difference between a weighted and non - weighted code with example.  
d) Given the logic equation.

$$F = \overline{A}BD + A\overline{B}C\overline{D} + \overline{A}BD + ABC\overline{D}$$

- i) Make a truth table.  
ii) Simplify using k - map.

[2]

OR

Simplify the following Boolean function by using Quine Mccluskey method.

$$F(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$$

2. a) What is logic gates?
- b) Draw the circuit diagram for half adder?
- c) Implement EX-OR gate using NOR gates.
- d) Explain the working of look ahead carry generator.

OR

Implement a full subtractor using two half subtractors and an OR gate.

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3. a) What do you understand by logic families?
- b) What is flip - flop? How many flip -flops are required for storing n bit of information?
- c) Distinguish between PMOS and NMOS logic circuit.
- d) Explain the operation of monostable multivibrator with the help of waveforms.

OR

Draw schmitt trigger circuit and explain with waveform.

[3]

4. a) What is shift register? Mention some application of shift register.
- b) Give broad classification of semiconductor memories.
- c) Write short note on encoder.
- d) Implement the function

$$F(A, B, C, D) = \sum (0, 1, 3, 4, 7, 8, 10, 13) \text{ Using multiplexer.}$$

OR

Design a MOD - 12 binary counter using J-K flip-flop.

5. a) What are the applications of analog to digital converter?
- b) How can we describe the resolution of a digital to analog converter?
- c) Explain the transfer characteristics and various performance parameters of DAC.
- d) Explain voltage to frequency converter with help of block diagram and waveforms.

OR

Explain successive approximation techniques for analog to digital conversion.

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