Roll No .....

EI/CS - 303

B.E. III Semester Examination, December 2014

Digital Circuits and Systems

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) Convert the following as directed i) $(101111.101)_2 = (\quad)_{10}$ ii) $(10110101)_2 = (\quad)_{gray.}$
   b) Subtract $(1010)_2$ from $(1000)_2$ using 1's and 2's complement method.
   c) Write briefly about error detecting and error correcting codes.
   d) Plot the following expressions in k-map and then minimize them
      i) $ABCD + A\overline{B}\overline{C}\overline{D} + A\overline{B}C + AB$ ii) $Y = \Sigma_m (7, 9, 10, 11, 12, 13, 14, 15)$

      OR

      Find the minimal sum of products for the Boolean expression $t = \Sigma (1, 2, 3, 7, 8, 9, 10, 11, 14, 15)$ using the quine McCluskey method.

Unit - II

2. a) What are universal gates? Explain with example.
   b) Design a half adder.
   c) Design a full subtractor using logic gates.
   d) Design and explain the working of BCD adder.

      OR

      Design and explain the working of look ahead carry generator.

Unit - III

3. a) Compare RTL and DTL logic families.
   b) Explain the working of R-S flip flop.
   c) With the help of circuit diagram and timing waveforms explain the working of monostable multivibrator.
   d) With the help of circuit diagram explain the working of Schmitt trigger.

      OR

      Discuss about the interfacing between TTL to MOS.

Unit - IV

4. a) Differentiate between multiplexer and encoder.
   b) Discuss briefly about series shift register.
   c) State and differentiate between ROM, PROM, EPROM, and EEPROM.
   d) Explain the working of four bit synchronous counter.

      OR

      Design and explain the working of binary to gray and gray to binary code converter.

Unit - V

5. a) What is the need for A/D converter?
   b) Distinguish single slope and double slope A/D converter.
   c) Explain a 4 bit R-2R ladder type D/A converter in detail.
   d) With a neat diagram explain successive approximation type A/D converter in detail.

      OR

      With the help of circuit diagram explain the working of V-F converters.

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