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Roll No ....

EC-3002 (CBGS)

B.E. III Semester

Examination, December 2017

Choice Based Grading System (CBGS)

Digital Circuits and System

Time : Three Hours

Maximum Marks : 70

Note: i)   Attempt any five questions.
  ii)   All questions carry equal marks.

1. a) What is universal gate? Implement AND, OR and NOT gates using NAND gates and NOR gates.

   b) Convert $(47)_{10}$ to
     i)   Binary
     ii) Octal
     iii) Hexadecimal

2. a) Explain the following classification on binary codes.
     Weighted codes
     Non-weighted codes
     Reflective codes
     Alphanumeric codes

   b) Write De-Morgan's theorem. Find the complement of the functions
     $F_1 = x'yz' + x'y'z$ and $F_2 = x(y'z' + yz)$. By applying De-Morgan's theorem.

3. a) Design a full adder circuit and write its truth table. Implement it with logic gates.

   b) Define multiplexers and draw a 4×1 multiplexer. How many selection lines are there?

4. a) Implement a full adder circuit with a (3 to 8 line) decoder and two OR gates.

   b) Simplify the Boolean function using K map.
     $F(ABCD) = $ sum of $(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

5. a) Differentiate combinational and sequential circuits. Give suitable examples for each class.

   b) What do you mean by Flip-Flops? Define D flip-flop with diagrams and tables.

6. a) Differentiate the followings:
     i)   Synchronous and asynchronous counters
     ii) Dynamic and static RAM

   b) What do you mean by shift registers? Design a shift left register of 4 bits.

7. a) Differentiate TTL and DTL logic families. Define fanout.

   b) Define the terms PROM, EEPROM, EAPROM.

8. Write short notes on any two:
   a) PLA
   b) ECL family
   c) Ring counter
   d) Exclusive OR gate

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