Code: 9A04306

R09

B.Tech II Year I Semester (R09) Supplementary Examinations, May 2013
DIGITAL LOGIC DESIGN
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1. (a) Convert the following decimal numbers into binary, octal and hexadecimal.
   (i) 255   (ii) 1023   (iii) 65,535   (iv) 4097
   (b) Convert the following binary numbers to gray code.
   (i) 10101100   (ii) 1110011   (iii) 10010010

2. (a) Prove using De Morgan's theorems that XoR and XNoR are complements to each other.
   (b) Prove that if a and b are switching variables then prove that $a + b = a \oplus b \oplus ab$.

3. (a) Simplify the following Boolean functions:
   $$f(a, b, c, d) = \sum m(2,3,6,8,10,14,15)$$
   (b) Simplify the Boolean function
   $$f(a, b, c, d) = \sum m(4,5,7,12,14,15) + \sum d(3,8,10)$$

4. (a) Realize a full adder using NAND gates.
   (b) Realize an half-adder using 2-input NAND gates.

5. (a) Realize an SR latch circuit using (i) NoR gates and (ii) NAND gates. Give truth table.
   (b) Convert a D flip flop to JK flip flop and to T flip flop.

6. (a) Design a 3-bit synchronous up counter using JK flip flops.
   (b) Construct a 2-bit serial input serial out shift register using T Flip-Flops.

7. (a) Implement a full-subtractor using ROM.
   (b) Design a BCD to excess -3 code converter using PLA Give the PLA programming table.

8. With examples discuss about.
   (a) Hazards.
   (b) Races in sequential circuits.

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