Code: R7220404

R07

B.Tech II Year II Semester (R07) Supplementary Examinations, April/May 2013
SWITCHING THEORY & LOGIC DESIGN
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1   (a)   Solve for x:
             (i) $(48)_{10} = (120)_x$
             (ii) $(32)_{16} + (47)_8 + (14)_5 = (x)_6$
    (b)   What are the weighted and non-weighted codes? Explain with an example.

2   (a)   Derive the Boolean expression for two inputs EX-OR gate to realize with two input
             NAND gates without using complimented variables and draw the circuit.
    (b)   Simplify the following expressions and implement them with NAND gate circuits:
             (i) $F = A\overline{B} + ABD + AB\overline{D} + \overline{A}\overline{C}\overline{D} + \overline{A}B\overline{C}$
             (ii) $G = BD + BC\overline{D} + A\overline{B}\overline{C}D$

3   (a)   Simplify the Boolean expression using K-map: $F = \overline{A} + AB + AB\overline{D} + A\overline{B}\overline{D} + C$
    (b)   Obtain the simplified expression using K-map: $F = ABD + \overline{A}\overline{C}D + \overline{A}B + \overline{A}C\overline{D} + A\overline{B}D$

4   (a)   Realize the function: $F(A, B, C, D) = \overline{A}B + \overline{B}\overline{C} + AD$ using 8X1 MUX.
    (b)   What are the encoders and explain 1X4 encoder with logic diagram and functional
             table.

5   (a)   Give the comparison between PAL and PLA.
    (b)   Tabulate the PLA programming table for the Boolean functions listed below:
             (i) $A(x, y, z) = \xi(1, 2, 46)$
             (ii) $B(x, y, z) = \xi(0, 1, 6, 7)$

6   (a)   Give the transition table for RS Flip-Flop.
    (b)   Give the design of 4-bit ring counter and explain with the waveforms. Also give the
             applications of the ring counter.

7   (a)   What are the Moore and Mealy machines? Compare them.
    (b)   What are the capabilities and limitations of finite state machines?

8   (a)   Differentiate between ASM chart and a conventional flow chart.
    (b)   Explain in detail the ASM technique of designing a sequential circuit.

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