

R07

Code: R7220404

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

- 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 complemented variables and draw the circuit.
 (b) Simplify the following expressions and implement them with NAND gate circuits:
 - (i) $F = \overline{A}\overline{B} + \overline{A}BD + A\overline{B}\overline{D} + \overline{A}\overline{C}\overline{D} + \overline{A}B\overline{C}$
 - (ii) $G = BD + BC\overline{D} + \overline{A}\overline{B}\overline{C}\overline{D}$
- 3 (a) Simplify the Boolean expression using K-map: $F = \overline{A} + AB + \overline{A}B\overline{D} + \overline{A}\overline{B}\overline{D} + C$
 (b) Obtain the simplified expression using K-map: $F = ABD + \overline{A}\overline{C}\overline{D} + \overline{A}B + \overline{A}\overline{C}\overline{D} + \overline{A}\overline{B}\overline{D}$
- 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) $A(x, y, z) = \xi(1, 2, 4, 6)$
 - (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.
