EGR 270 Due date: See Due Dates Table
Fundamentals of Computer Engineering
File: N270H4

Homework Assignment #4

Reading Assignment:

Chapter 3 in the textbook Logic and Computer Design Fundamentals, 5th Edition by Mano

Problem Assignment:

1) Chapter 3 problems: 1, 2, 3, 4, 6, 8, 9, 10, 20
   Hint for 3-3: It is best to list the inputs in normal counting order to make it easy to fill out Kmaps.
   Hint for 3-6: The light should turn on when an odd number of switches are in the ON position.
2) Design a driver circuit for a common-anode 7-segment display that operates as follows:
   - The display should show 0-5 for the corresponding BCD inputs
   - The display should be blank for inputs 6 – 15
   - Recall that a LOW output is required to light a segment on a common-anode display
   - Show the truth table, the Kmaps used to determine the 7 output expressions (minimal SOP), and the logic diagram.
3) See page 2.

Selected Answers:

3-1) F = XZ + XY + YZ
3-3) B3 = G3, B2 = G3⊕G2 + G3G1, etc.
3-4) a) W = X1X2X3 + X4X5X6 + ……
     b) W = X5(X1X9 + X2X8 + …) + …
3-6) Z = X1⊕X2⊕X3 (if odd parity is used)
3-8) S0 = C, S1 = 0, S2 = A'BC' + ABC', S3 = A'BC + AB'C, etc
3-9) S0 = B'C'D+B'CD'+AB'+AC'D'+A'BCD, etc
3-20) Algebraically show that F = XY + X'Y'
2) a = A + BC + BD' + B'C'D
   b = A + BC + BD
   c = A + BC + CD'
   etc

(continued)

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EGR 270 HW #4 (continued) – ***Turn in this worksheet as part of the assignment***

3) Given the following input waveforms ABCD for problem 3-10, sketch the outputs WXYZ using the grid provided below. This sheet can be printed out, filled in, and turned in with the assignment.