

COE/EE 243
Homework Assignment #2
Due Friday Jan. 7 by 5:00pm

Show your work on all of the problems below. If you want to see sample problems with solutions go to <http://www.ddpp.com/student/student.html>

1. Problem 4.6, part in text by Wakerly. State which theorems you are using.

2. Find the complement and the dual of the following expression

A $F(V, W, X, Y, Z) = X + Y \cdot (Z' + V \cdot W')$

B $G(A, B, C, D, E, F, G) = (A'B + 0)(C \cdot D + E') + F(G' + 1) + D$

3. Rewrite the following expressions in sum of products form.

A $F = W + X \cdot (Y' + Z)$

B $G = (A' + B + C \cdot D) \cdot (B' + C + D' \cdot E')$

4. Rewrite the expressions from problem 3. in product of sums form.

5. Find the truth table for each of the logic functions given in problem 3..

6. Express the logic functions of problems 3. as a list of minterms and maxterms using appropriate notation from class.

7. Sketch a logic circuit diagram for the two logic functions given in problem 3..

8. Express the following in standard sum of products form and in standard product of sums form (also referred to as finding the canonical sum and canonical product).

A $F = \sum_{ABC}(2, 4, 5, 7)$

B $G = \prod_{MNP}(0, 1, 2, 6, 7)$

C $G = \prod_{ABCD}(1, 2, 5, 6)$

9. Find the truth tables for the logic functions of problem 8.

10. Do the following:

A Sketch the logic circuit diagram for the functions in parts **A** and **C** of problem 8.

B Repeat using a circuit made up only of NAND gates.