

EE 2720

Homework #4, Spring 05

Due Friday March 18, 2005

at 9:30 am in my office

(Room EE 245)

Homework # 4

Note: Please STAPLE your homework.

Problem 1: Prove that theorem (T10) is a special case of theorem (T11). Look at handout # 5 for theorems (T10) and (T11).

Problem 2: Do Drill Problem 4-6 of your textbook

Problem 3: Multiply out
 $(A+B+C') \cdot (A'+B'+D) \cdot (A'+C+D') \cdot (A+C'+D)$

Hint: Use the theorems (T8), (T8') (look in handout # 5 for (T8), (T8')) and the theorem of equation (1) provided below:

$$(X+Y) \cdot (X'+Z) = X \cdot Z + X' \cdot Y \quad (1)$$

The theorem of eq. (1) above was stated and proved in handout # 6. Start by applying (T8') first and then theorem of eq. (1) and (T8). It is easy. What would happen if you were to multiply out using only theorem (T8)?

Problem 4: Factor

$$W \cdot X \cdot Y' + W' \cdot X' \cdot Z + W \cdot Y' \cdot Z + W' \cdot Y \cdot Z'$$

Hint: Use the theorems (T8), (T8') (look in handout # 5 for (T8), (T8')) and the theorem of equation (1) provided below:

$$(X+Y) \cdot (X'+Z) = X \cdot Z + X' \cdot Y \quad (1)$$

The theorem of eq. (1) above was stated and proved in handout # 6. Start by applying (T8) first and then theorem of eq. (1) and (T8'). With the hint I gave you it is not that difficult. I only got 4 sum terms.

EE 2720

Homework #4 cont.

(2)

Problem 4 cont.: Try to get only 4 sum terms if you can.

Problem 5: Do Drill Problem 4.9 of your textbook.

Problem 6: Write the canonical product for the following logic function:

$$F = (a + b) \cdot (a + c) \cdot (b + c)$$

You are not allowed to provide the canonical sum first and then convert it into canonical product. Hint: $X \cdot X' = 0$ and $X + 0 = X$. Now the problem is not really difficult.