EE 2720, Fall 06

HW# 4

Due Friday Nov. 3 at 9:30 in my office (EE, room 245)

Friendly

Alex

EG 2720, [redacted] HW #4

Note: Please staple your homework

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

Pr. 2: Use the theorems of switching algebra to simplify the following:

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

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

(c) $F = M \cdot N \cdot O + Q' \cdot P' \cdot N' + P \cdot R \cdot M + Q' \cdot O \cdot M \cdot P' + M \cdot R$

Pr. 3: Multiply out

$(A+B+C') \cdot (A'+B'+D) \cdot (A'+C+D') \cdot (A+C'+D)$

Hint: Use theorems (T8), (T8'); Look in handout #5 for (T8), (T8')) and the theorem of eq. (1) provided below:

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

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 (T8)?

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Pr. 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 eq. (1) provided below:

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

Start by applying (T8) first and then the-orem of eq. (1) and (T8'). With the hint I gave you it is not that difficult. I only got 4 sum terms. Try to get 4 sum terms.

Problem 5: Write the canonical sum and product for each of the following logic functions:

(a) $F = \Sigma_{X,Y}(1,2)$

(b) $F = \Pi_{A,B}(0,1,2)$

(c) $F = \Sigma_{A,B,C}(2,4,6,7)$

(d) $F = \Pi_{M,N,P}(0,1,3,6,7)$

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

(f) $F = A' \cdot B + B' \cdot C + A$

this is X

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Pr. 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 difficult

Enjoy your HW

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