Switching Circuits & Logic Design, Fall 2003

Quiz # 1 (10/31/2003)

Problem 1:

In this problem, we consider the problem that two Boolean functions are given as follows:

(a) F(U,V,W,X,Y,Z) = UVWZ + UWYZ + UWXZ

(b) F(A,B,C,D,E,F) = (B+C+E+F)(A+C+E+F)(C+D+E+F)

Please plot the circuit using only one AND gate and one OR gate to realize **(a)** (10 points) and **(b)** (10 points).

Problem 2:

(a) Please simplify Z=B'D'+C'D'+A'BC+ACD'+AB'CD algebraically and show its minimum SOP. State the theorem you use to eliminate terms and/or literals in each step. (10 points)

(b) Please factor Z, and show its minimum POS. (10 points)

Problem 3:

(a) Please draw the Karnaugh map of F= Π M(1,3,5,6,9,15,13) D(4,12). (10 points)

(b) Please simplify F and show the minimum SOP of F. (10 points)