Logic Design – Homework 4

(1) Draw the logic diagram for the following Boolean expressions:
(a) XYZ' + XY' + X'Z
(b) X + X'(X'+Y) + (Y'+Z)

(2) Prove the identity of each of the following Boolean equations using algebraic manipulation.
(a) X'Y' + X'Y + XY = X'+Y
(b) A'B + B'C' + AB + B'C = 1
(c) Y + X'Z + XY' = X +Y + Z

(3) Simplify the following expressions by using Boolean algebra.
(a) F= (X(Y'+V+X'))'+((X+Z'+W')(Y+V+W'))'
(b) F = X+Y(Z+(X+Z)')
(c) F= WX(Z+YZ)+X(W+WYZ)

(4) Using DeMorgan's theorem, express the function **F=A'BC + AC' + A'B**
(a) with only OR and complement operations
(b) with only AND and complement operations

(5) Express the following functions in sum of minterms and product of maxterms forms.
(a) F(X,Y,Z)= (X+YZ)(Z+YX)
(b) F (XYZ)= X'+X(X+Y')(Y'Z')