HW2

1. Prove the identity of each of the following Boolean equations, using algebraic manipulation:

   (a) $\bar{A}B + \bar{B}\bar{C} + AB + \bar{B}C = 1$

   (b) $Y + \bar{X}Z + X\bar{Y} = X + Y + Z$

2. Simplify the following Boolean expressions to expressions containing a minimum number of literals:

   (a) $\overline{(A + B + C)} \cdot \overline{ABC}$

   (b) $AB\bar{C} + AC$

3. Using DeMorgan's theorem, express the function

   $F = \bar{A}BC + A\bar{C} + \bar{A}B$

   (a) with only OR and complement operations.

   (b) with only AND and complement operations.

4. Obtain the truth table of the following functions, and express each function in sum-of-minterms and product-of-maxterms form:

   (a) $(X + YZ)(Z + YX)$

   (b) $W\bar{X}Y + W\bar{X}Z + WX\bar{Z} + XY$

5. For the Boolean functions E and F, as given in the following truth table:

X	Y	Z	E	F
0	0	0	1	0
0	0	1	0	1
0	1	0	1	0
0	1	1	0	1
1	0	0	1	1
1	0	1	0	0
1	1	0	0	1
1	1	1	1	0

   (a) Express E and F in sum-of-minterms and product-of-maxterms algebraic form

   (b) Draw the logic diagram of E and F with sum-of-minterm