Logic Design - Homework 5

(1) Answer the following questions for the truth tables given below for the functions Y1 and Y2.

(a) Express the functions Y1 and Y2 by using sigma (Σ) notation.
(b) Express the functions Y1 and Y2 by using pi (Π) notation.
(c) Express the functions Y1 and Y2 in sum of minterms canonical form.
(d) Express the functions Y1 and Y2 in product of maxterms canonical form.
(e) Express the functions Y1 and Y2 with the minimal Boolean equation in sum of products form.
(f) Express the functions Y1 and Y2 with the minimal Boolean equation in product of sums form.
(g) Minimize the Boolean equations for the functions Y1 and Y2 by using K-maps.

A	B	C	Y1
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

A	B	C	D	Y2
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0

(2) Find the minimal Boolean equations for the functions F1 and F2 given below by using K-maps. Remember to take advantage of the don't care entries.

F1 (A,B,C,D) = ∑ (8, 11, 12, 13, 15), d (A,B,C,D) = ∑ (0, 1, 2, 5, 7, 10, 14)

F2 (W,X,Y,Z) = ∑ (1, 8, 11, 13, 15), d (W,X,Y,Z) = ∑ (2, 3, 5, 6, 7, 14)