

# Problem Set 2

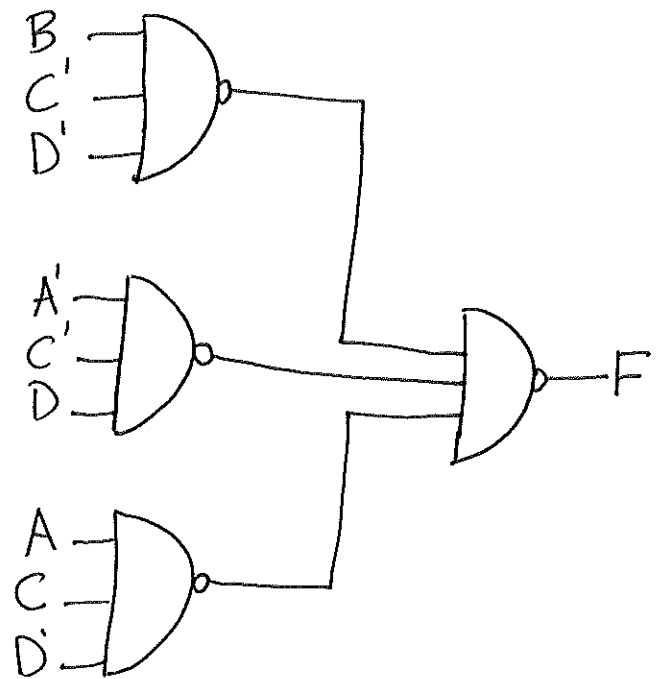
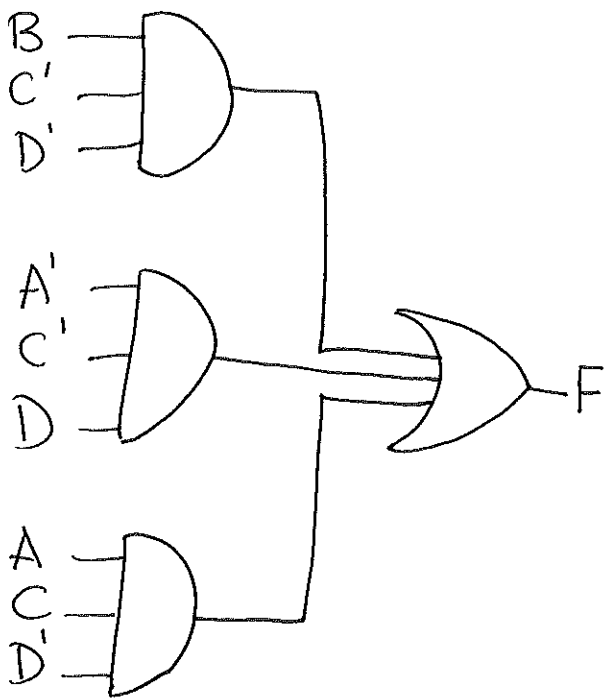
## - Solutions -

ENCS 234  
Fall 2015

Problem 1:  $F(A, B, C, D) = \sum(1, 4, 5, 10, 12, 14)$

	CD				
AB		00	01	11	10
00			1		
01		1	1		
11		1			1
10					1

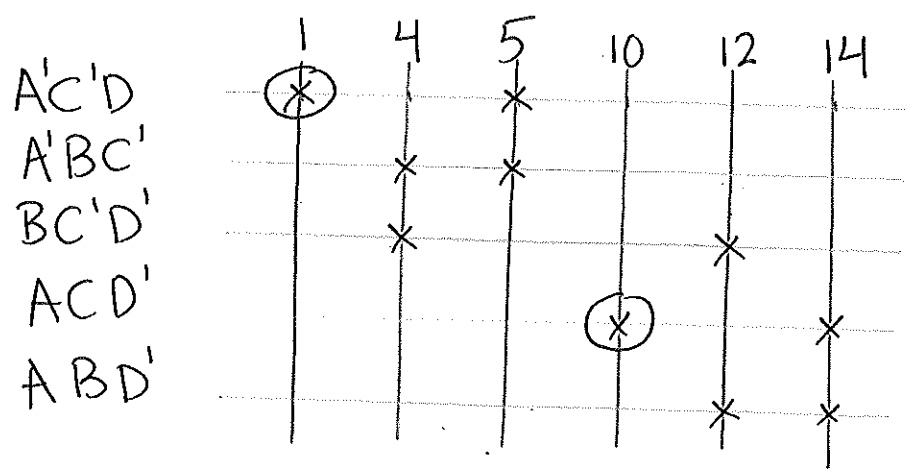
$$F = BC'D' + A'C'D + ACD'$$



Problem 2:  $F(A, B, C, D) = \sum(1, 4, 5, 10, 12, 14)$   
 $= \sum(0001, 0100, 0101, 1010, 1100, 1110)$   
 index:      1          1          2          2          2          3

First List			
Index	minterms	A	B C D
1	1	0	0 0 1 ✓
	4	0	1 0 0 ✓
2	5	0	1 0 1 ✓
	10	1	0 1 0 ✓
	12	1	1 0 0 ✓
3	14	1	1 1 0 ✓

Second List			
minterms	A	B C D	
1, 5	0	- 0 1	$A'C'D$
4, 5	0	1 0 -	$A'BC'$
4, 12	-	1 0 0	$BC'D'$
10, 14	1	- 1 0	$ACD'$
12, 14	1	1 - 0	$ABD'$



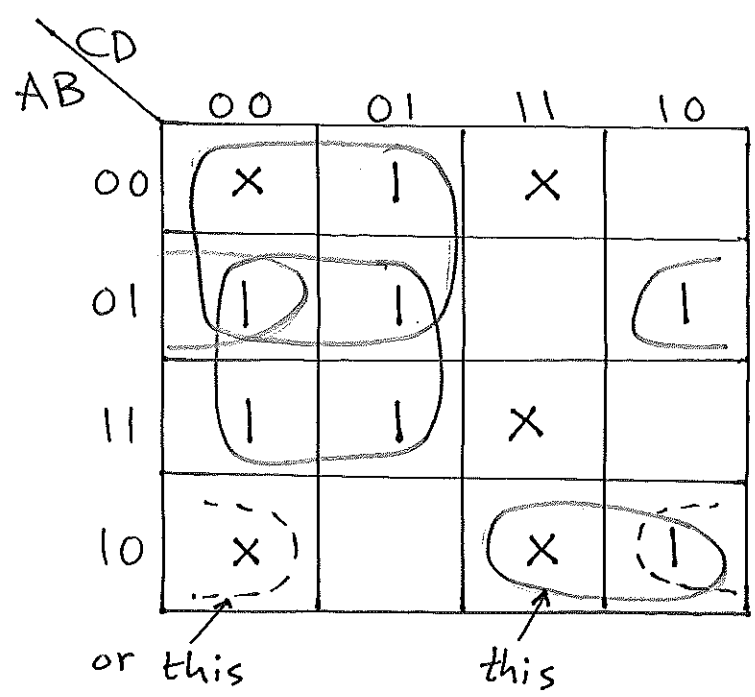
Essential Prime Implicants are:  $A'C'D$ ,  $ACD'$

and they cover the minterms: 1, 5, 10, 14

The remaining minterms are covered by:  $BC'D'$  (4, 12)

The only minimal solution is  $F = A'C'D + ACD' + BC'D'$

Problem 3:  $F = \sum (1, 4, 5, 6, 10, 12, 13)$   
 $d = \sum (0, 3, 8, 11, 15)$



$F = A'C' + BC' + A'BD' + AB'C$   
 or  $F = A'C' + BC' + A'BD' + AB'D'$

Problem 4:

