

EC262 Problem Set 5 (Solutions)

Due: Monday 10 September 2012

Complete the following problems from the textbook *Digital Design with an Introduction to the Verilog HDL*, Mano and Ciletti, Fifth Edition.

Chapter 3

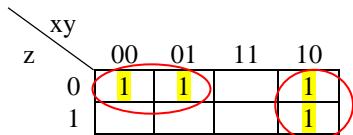
Problems: 1, 3.

<i>ABC</i>	<i>Minterm</i>	<i>Number</i>
0 0 0	$A'B'C'$	0
0 0 1	$A'B'C$	1
0 1 0	$A'BC'$	2
0 1 1	$A'BC$	3
1 0 0	$AB'C'$	4
1 0 1	$AB'C$	5
1 1 0	ABC'	6
1 1 1	ABC	7

From Alan Marcovitz, *Introduction to Logic Design*, 3rd ed, McGraw Hill, 2010

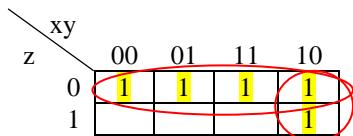
Problem 1: Simplify the following Boolean functions using 3-var K-maps.

a. $F(x,y,z) = \Sigma(0,2,4,5)$



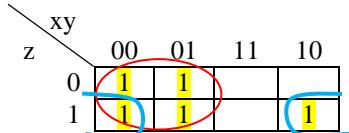
$$F(x,y,z) = x'z' + xy'$$

b. $F(x,y,z) = \Sigma(0,2,4,5, 6)$



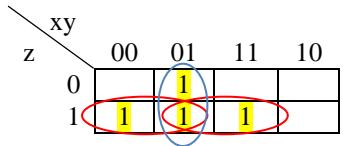
$$F(x,y,z) = z' + xy'$$

c. $F(x,y,z) = \Sigma(0,1,2,3,5)$



$$F(x,y,z) = x' + y'z$$

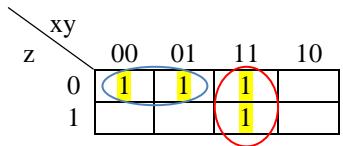
d. $F(x,y,z) = \Sigma(1,2,3,7)$



$$F(x,y,z) = x'z + yz + x'y$$

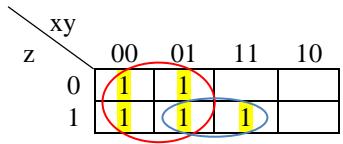
Problem 1: Simplify the following Boolean expressions using 3-var K-maps.

a. $xy + x'y'z' + x'yz'$



$$F = xy + x'z'$$

b. $x'y' + yz + x'yz'$



$$F = x' + yz$$

c. $F(x,y,z) = x'yz + yz' + y'z'$

	xy			
z	00	01	11	10
0	1	1	1	1
1		1		

$$F = z' + x'y$$

d. $F(x,y,z) = x'yz + xy'z' + xy'z$

	xy			
z	00	01	11	10
0				1
1		1		1

$$F = x'yz + xy'$$