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CSCI 3130

Homework 4

Due: Feb. 16, 10:00 PM

1. (3 points each) Simplify the following Boolean expressions using algebraic manipulation.

a.  $F(A,B,C) = AC' + ABC' + AC$   
 $= A(C' + C) + ABC'$   
 $= A + ABC'$

b.  $F(X,Y,Z) = X'Y'Z' + X + Y + Z$   
 $= Y'Z' + X + Y + Z$   
 $= Z' + X + Y + Z$   
 $= X + Y + 1$   
 $= X + 1$   
 $= 1$

2. (3 points each) For each of the following truth tables, use a Karnaugh map to get a simplified expression in the requested format.

a. [Sum of Products]  $F(A,B,C,D) = \sum m(0,3,4,6,10,11)$

		$C'D'$	$C'D$	$CD'$	$CD$
$A'B'$	1	0	1	0	
$A'B$	1	0	0	1	
$AB$	0	0	0	0	
$AB'$	0	0	1	1	

Labels:  $A$  (rows),  $B$  (columns),  $C$  (bottom),  $D$  (right)

[SOP] =  $A'C'D' + A'BD' + B'CD + AB'C$   
 $F(A,B,C,D)$