CSE 320 Fall 2014 ***Homework #1 Quiz, Version 1***

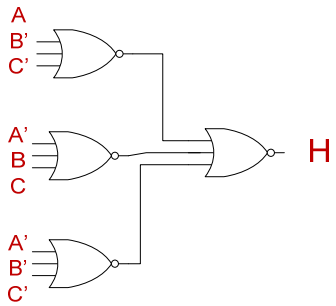
Name:_____SOLUTION_____ID:_____

No calculators, notes, or textbooks allowed. Show all your work for full credit.
***Time limit:** 15 mins*

Problem 1:

$$H(A,B,C) = \Pi M(3,4,7)$$

[4 points] a) Draw the 2-level NOR-NOR network for H. DO NOT SIMPLIFY.



[2 points] b) Write the **minterm** Boolean expression for H in Sum of Products (SOP) form.

H = A'B'C' + A'B'C + A'BC' + AB'C + ABC'

[4 points] c) Simplify the expression from Part b) using Boolean algebra (Hint: There are 3 terms and 6 literals).

H = A'B'C' + A'B'C + A'BC' + AB'C + ABC'
H = A'B'(C'+C) + (A+A')B'C + (A'+A)BC'
H = A'B' + B'C + BC'

(More on back)

Problem 2:

F(a,b,c,d) = ((bcd)’(c’d+a) + ((a’c’d)’+ c’d’)’)’

[2 points] a) How many literals are in F? _____**11**_____ terms?_____**7 OR 5**_____

[4 points] b) Simplify F using DeMorgan’s law. You do not need to fully simplify the expression. Only remove all NAND expressions.

((bcd)’(c’d+a) + ((a’c’d)’+ c’d’)’)’
((bcd)’(c’d+a))’((a’c’d)’+ c’d’)
((bcd)+(c’d+a)’)((a’c’d)’+ c’d’)
((bcd)+((c’d)’a’))((a+c+d’)+ c’d’)
((bcd)+((c+d’)a’))((a+c+d’)+ c’d’)

CSE 320 Fall 2014 *Homework #1 Quiz, Version 2*

Name:_____ SOLUTION_____ID:_____

No calculators, notes, or textbooks allowed. Show all your work for full credit.
***Time limit:** 15 mins*

Problem 1:

G(w,x,y,z) = (wx(y'z')' + w'xy + x'(zw+zy')')'

[2 points] a) How many literals are in G? _____**12**_____ terms?_____**7 or 6**_____

[4 points] b) Simplify G using DeMorgan's law. You do not need to fully simplify the expression. Only remove all NAND expressions.

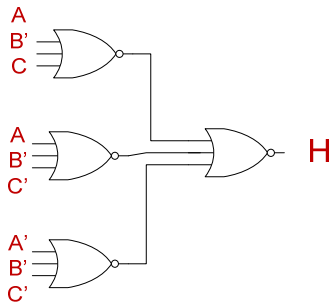
(wx(y+z) + w'xy + x'(zw+zy')')'
(wxy + wxz + w'xy + x'(zw+zy')')'
(wxy)' (wxz)' (w'xy)' (x(zw+zy'))
(w'+x'+y') (w'+x'+z') (w+x'+y') (xzw + xzy')

(More on back)

Problem 2:

$$H(A,B,C) = \Pi M(2,3,7)$$

[3 points] a) Draw the 2-level NOR-NOR network for H. DO NOT SIMPLIFY.



[2 points] b) Write the **minterm** Boolean expression for H in Sum of Products (SOP) form.

H = A'B'C' + A'B'C + AB'C' + AB'C + ABC'

[4 points] c) Simplify the expression from Part b) using Boolean algebra (Hint: There are 2 terms and 3 literals).

H = A'B'C' + A'B'C + AB'C' + AB'C + ABC'
H = A'B' (C+C') + AB'(C+C') + AC'(B'+B)
H = A'B' + AB' + AC'
H = (A' + A)B' + AC'
H = B' + AC'