ESET 219 Homework 3

Name:

Section:

1. Simplify the following Boolean expressions
   a. $\overline{\overline{X}\overline{Y}}\overline{XY}$

   (XY')'(Y+X)'
   X'+Y'(Y'X')
   X'Y'+X'Y'=X'Y'

   b. $X'YX + XZ$

   0+XZ=XZ

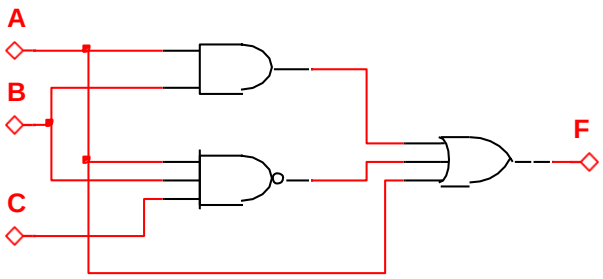
   c. $\bar{A}\bar{B}\bar{C} + \overline{\bar{A}\bar{B}\bar{C}} + \bar{A}\bar{B}\bar{C}D$

   A'B'C'+(A'B'C)+A'B'C'D=A'B'

   d. $(\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}D + \bar{A}\bar{B})C$

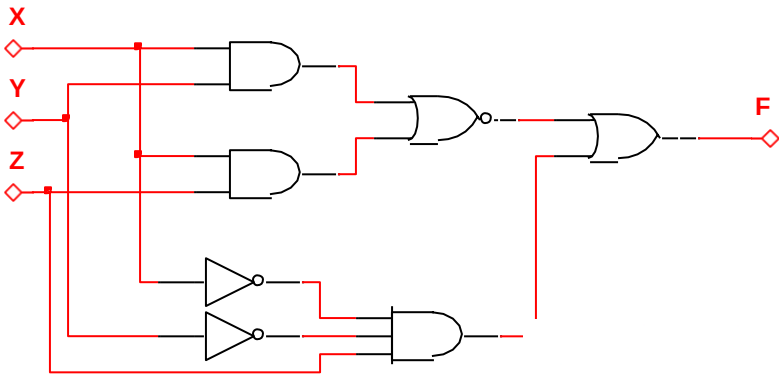
   B'C

2. For each given schematic
    a. Write the Boolean equation for the output F.
    b. Use Boolean algebra to simplify F. Draw the simplified circuit schematic



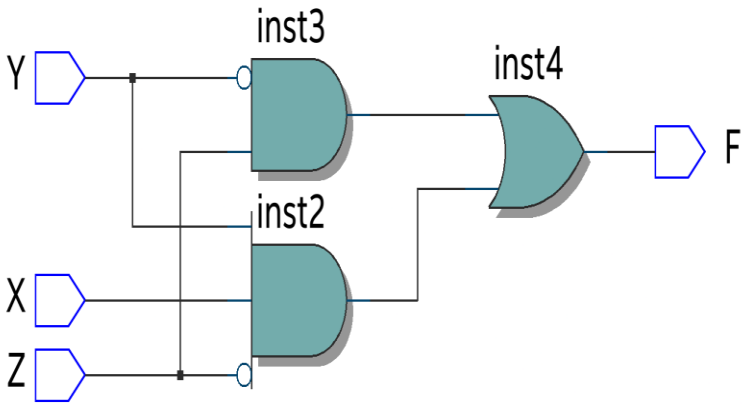
A+(ABC)'+AB=F

A+A'+B'+C'+AB
1+AB+B'+C'
1=F



(XYXZ)+(X'Y'Z)=F

XY(XZ)'+XZ(XY)'+X'Y'Z
XY(X'+Z')+XZ(X'+Y')+X'Y'Z
XYZ'+XZY'+X'Y'Z
Y'Z(X'+X)+XYZ'
XYZ'+Y'Z=F



3. Given the following truth table
    a. What are all the minterms?
    b. What are all the maxterms?
    c. Write F as a SOP equation (unsimplified)
    d. Use Boolean algebra to simplify F from part c. (must show work for credit)

A	B	C	F		
0	0	0	0	maxterm	A'B'C'
0	0	1	1	minterm	A'B'C
0	1	0	0	maxterm	A'BC'
0	1	1	1	minterm	A'BC
1	0	0	0	maxterm	AB'C'
1	0	1	0	maxterm	AB'C
1	1	0	1	minterm	ABC'
1	1	1	1	minterm	ABC

F=(A'B'C)+(A'BC)+(ABC')+(ABC)

A'C(B'+B)+AB(C'+C)
A'C+AB=F