Name _____ GT#_____

ECE2030b HW-2 Due Wed. Sept.18, 2002 --- ANSWERS

Question 1 – Truth Table.

Given the Boolean expression: Out = AB + ABC + A'B'

Hint – simplify first _____AB + A'B'_____

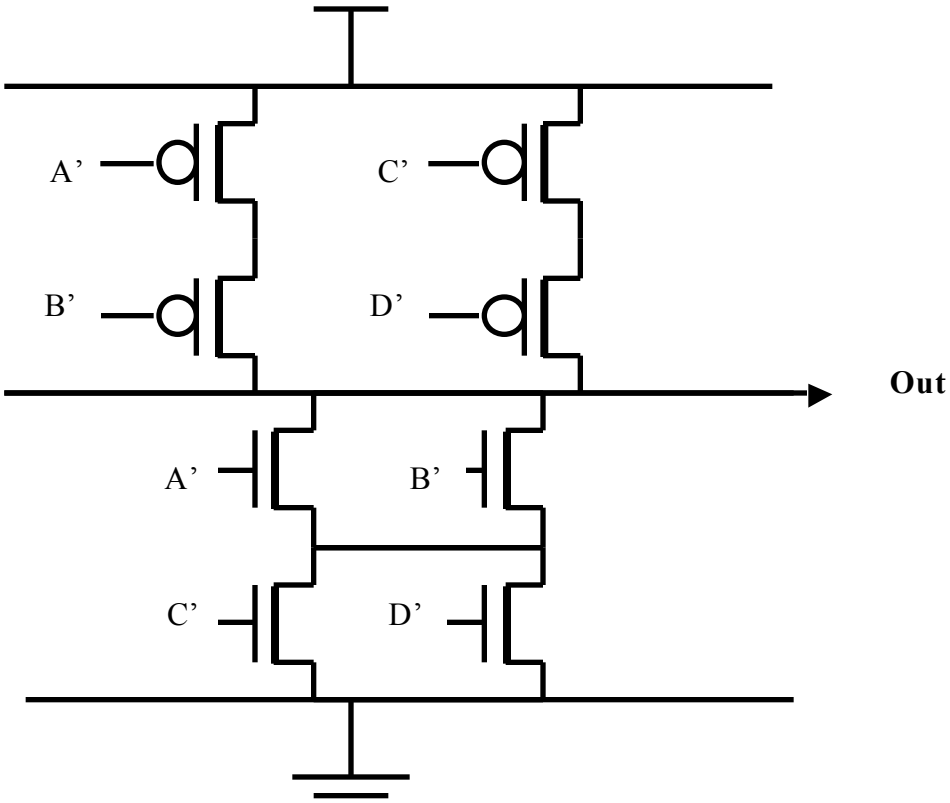
Complete the truth table.

A	B	C	Out
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

Name _____

Question 2 – CMOS Logic

Draw the CMOS transistor diagram for AB + CD. Assume A, A', B, B', C, C',D' and D' signals are available.



Question 3 – Logic Identities Simplify the follow Boolean expressions:

A. X(X+Y) ___X___

B. X + Y + XZ ___X + Y___

C. (X' + Y')' ___XY___

D. X + XY ___X___

E. XY + YZ + X'Z ___XY + X'Z (if YZ =1 then Y=1 and Z=1 & XY or X'Z =1)___

Name _____

Question 4 – Minterm and Maxterm Indices

For the truth tables below, express the minterm sum of products, and the maxterm product of sums:

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

sum of products ___A'BC' + AB'C + ABC_____

product of sums ____(A'+B'+ C') (A'+B'+ C) (A'+B+ C) (A+B'+ C') (A+B+ C')____

Draw a Karnaugh Map for the truth table in Question 4. Circle the Prime Implicants with a solid line. Label the Essential prime Implicants with a dashed line. **F = AC + A'BC'**

A \ BC	00	01	11	10
0	0	0	0	1
1	0	1	1	0

AC

Question 5 – Karnaugh Map For the Karnaugh map below, circle the Prime Implicants and label the Essential Prime Implicants with "EPI" [all are "Essential" Prime Implicants except A'BC and A'CD].

AB \ CD	00	01	11	10
00	0	1	1	0
01	1	0	1	1
11	0	0	0	1
10	0	1	1	0

Write the reduced logic expression: ____A'D + A'BD' + BCD' + (A'BC or A'CD)____

maxterm indices (decimal) ____0, 2, 5, 7, 8, 10, 12, 13, 15_____