

ECE 2030b, Intro. To Computer Eng., HW-2 (was 2001 QUIZ 1)

Due Sept. 13, 2002

**Question 1 – Truth Table.**Given the Boolean expression:  $\text{Out} = AB + ABC + A'B'$ 

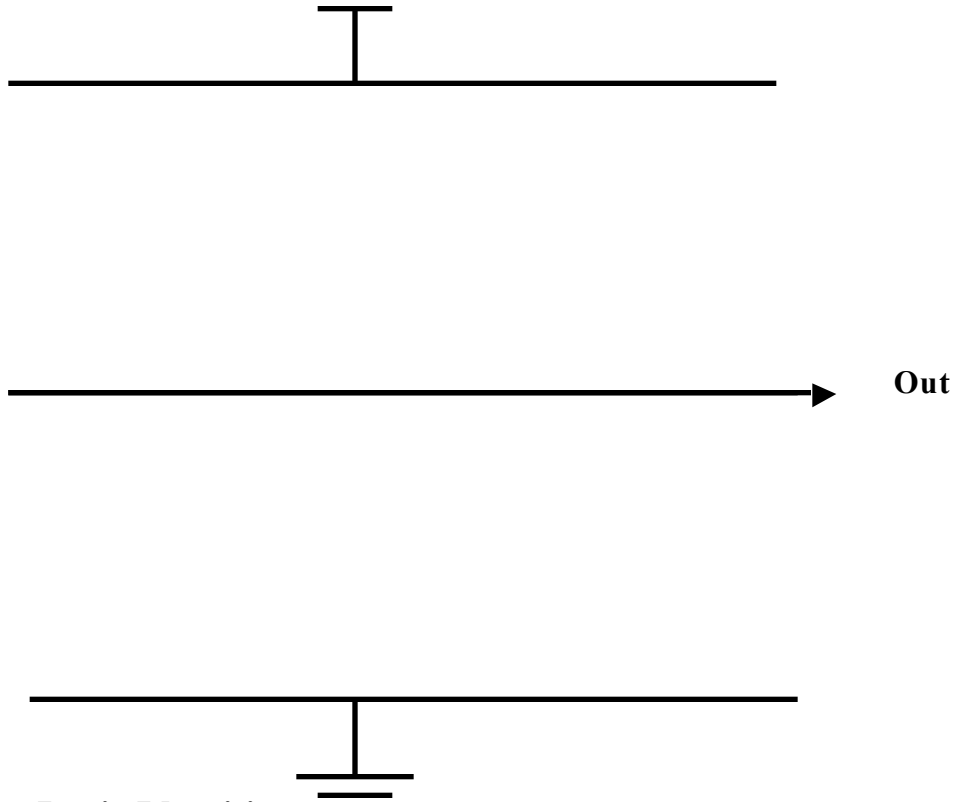
Hint – simplify first \_\_\_\_\_

Complete the truth table.

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

**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.  $X(X+Y)$  \_\_\_\_\_

B.  $X + Y + XZ$  \_\_\_\_\_

C.  $(X' + Y)'$  \_\_\_\_\_

D.  $X + XY$  \_\_\_\_\_

E.  $XY + YZ + X'Z$  \_\_\_\_\_

**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 \_\_\_\_\_

product of sums \_\_\_\_\_

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.

A \ BC				

**Question 5 – Karnaugh Map** For the Karnaugh map below, circle the Prime Implicants and label the Essential Prime Implicants with “EPI”.

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

Write the reduced logic expression: \_\_\_\_\_

maxterm indices (decimal) \_\_\_\_\_