Name _____ GT#_____

ECE 2030h, Intro. To Computer Eng., QUIZ 1

Quiz No. 1: Sept. 13, 2001
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RULES.

i This quiz is closed book.

ii. Non-programmable calculators may be used.

iii Answer all questions and show all work to receive full credit.

iv All questions have the same weight. (20 Points). All sub-questions within a question are weighted equally.

v Please do not ask the proctors any questions during the exam about exam questions. Part of the test is understanding the question as written, without supplemental information. If you feel additional data is needed to solve the problem, make (and state) an assumption and then work the problem.

Question 1 – Truth Table.

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

Hint – simplify first _____AB + A'B'_____

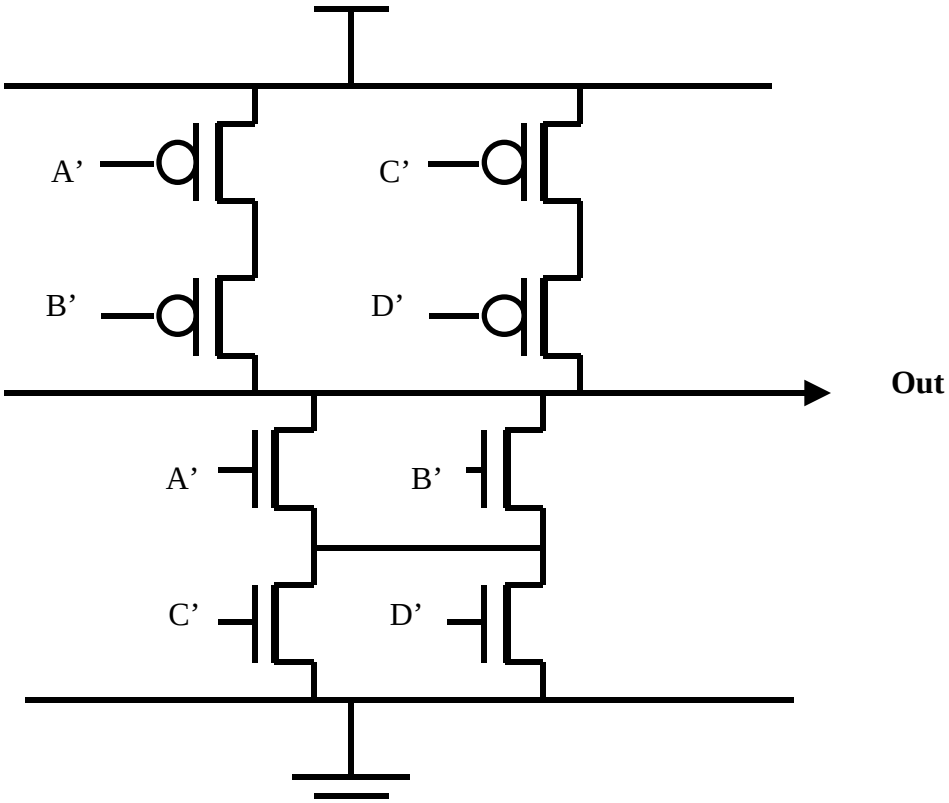
Complete the truth table.

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_____