

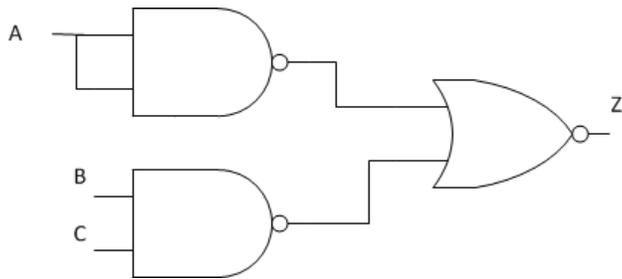
Homework 3 CS/ECE 252: Sec 1 & 2 [Due at lecture on Fri, Feb 21]

Primary contact for this hw: Muralidharan Sivalingam [murali10 at cs dot wisc dot edu]

Instructions: You must do this homework alone. Please hand in ONE copy of the homework listing your section number, full name (as appear in Learn@UW) and UW ID. You must staple all pages of your homework together to receive full credit.

Problem 1 (6 points)

For the following circuit ,



- (a) (2 Points) Give the equation for output Z in terms of inputs A, B and C.
- (b) (4 Points) Fill in the truth table for Z.

Problem 2 (2 points)

Given the logic equation $Z = \text{NOT}(B) \text{ AND } ((\text{NOT}(A) \text{ AND } \text{NOT}(C)) \text{ OR } C)$

Draw the gate-level circuit for Z using only 2-input NOR gates (Hint: DeMorgan's Law).

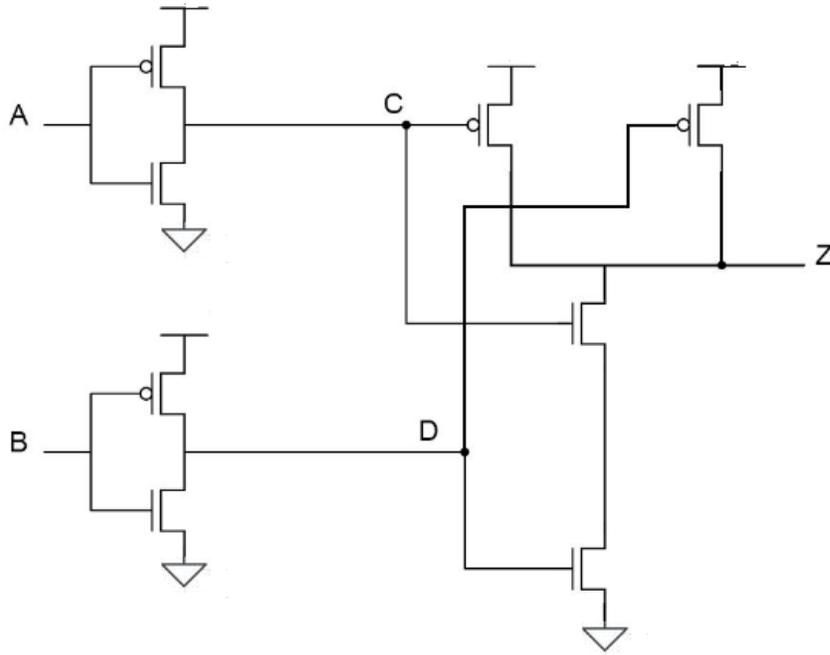
Problem 3 (9 points)

Given the logic equation $Z = \text{NOT}(A \text{ OR } B) \text{ OR } \text{NOT}(C)$

- a) (4 points) Fill out the truth table for Z.
- b) (3 points) Draw the gate-level circuit for Z using only 2-input NAND or NOR gates (Hint: DeMorgan's Law).
- c) (2 points) Draw the transistor-level equivalent of the circuit

Problem 4 (6 points)

Given the following transistor level circuit :



a) (4 points) Fill out the truth table for Z

A	B	C	D	Z
0	0			
0	1			
1	0			
1	1			

b) (2 points) Give the equation for Z in terms of A and B

Problem 5 (5 points)

Imagine a logic circuit that performs the following function. It has three inputs A, B, and C. The output Z is 1 only if C = 0 and one among A and B is 0 (not both).

a. (3 points) Fill out the truth table for Z

b. (2 points) Write the logic expression for Z in terms of A, B and C.

Problem 6 (2 points)

The circuit below has a major flaw. Can you identify it? Hint: Evaluate the circuit for all sets of inputs.

