Embedded Real-Time Systems (AME 3623)
Homework 1

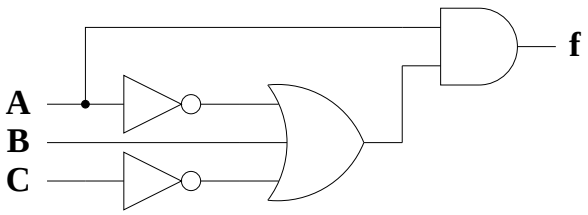
January 27, 2007

This homework assignment is due on Tuesday, February 6th at 5:00pm. Your work may be handed in electronically (use the **Homework 1** digital dropbox on D2L) or in hardcopy form (in person or in office).

This assignment must be done individually: do not share/discuss your answers with others or look at the answers of others.

Question 1

Consider the following circuit.



(10 pts) What is the corresponding truth table?

Question 2

Consider the following function:

A	B	C	f
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

1. (10pts) Show the algebraic expression for the "minterm" form of the circuit (set of 3-term ANDs that are then ORed together).

2. (10pts) Show the corresponding circuit

3. (10pts) Reduce this algebraic expression to a minimal form (note that there may be more than one correct answer). Show each step, showing the name of the rule that you use.

4. (10pts) Show the corresponding circuit

Question 3

Consider the following function:

A	B	C	f
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

1. (10pts) Show the algebraic expression for the "minterm" form of the circuit.

2. (10pts) Reduce this algebraic expression to a minimal form. Show each step, showing the name of the rule that you use.

3. (10pts) Show the reduced circuit.

Question 4

Suppose you need a circuit to perform an inversion (i.e., implement the NOT operator), but that you only have NOR gates.

(10 pts) How is this circuit wired (give a circuit diagram)?

Question 5

How much time did you spend on this homework assignment?