**Computer Science 240**
Basic Logic
Assignment for Lab 2

Due: at beginning of Lab, submit hardcopy with solutions

1. Write a Boolean function for F given the following truth table, using a sum-of-products form, and **do not simplify** your expression.

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

2. Write a boolean function for F produced by the following transistor circuit (HINT: you should try to identify subcircuits which look like circuits you saw in lecture and lab for basic gates, working your way from left to right):
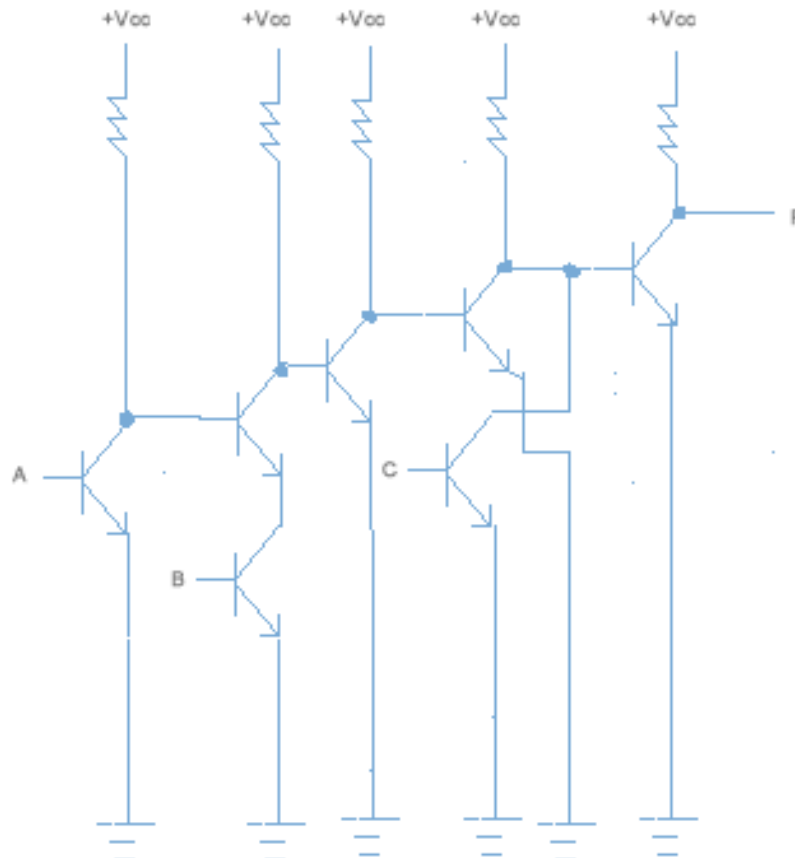
2. Draw a circuit which implements the following function G, using the logic gate symbols for AND, OR, and NOT.

Do not simplify G before drawing the circuit.

You may use 1, 2, or 3-input gates of type AND, OR, and NOT.

$$G = A(BC + B' + C') + B(AB + A'B)$$

3. Give the truth table for G. In the truth table, include the outputs of each of the gates in your circuit:

A	B	C	G
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

4. Use the identities of Boolean algebra to show that G is equivalent to F = A + B.   Show all your work, and list the identity used for each step.

G = A(BC + B' + C') + B(AB + A'B)   F = A + B