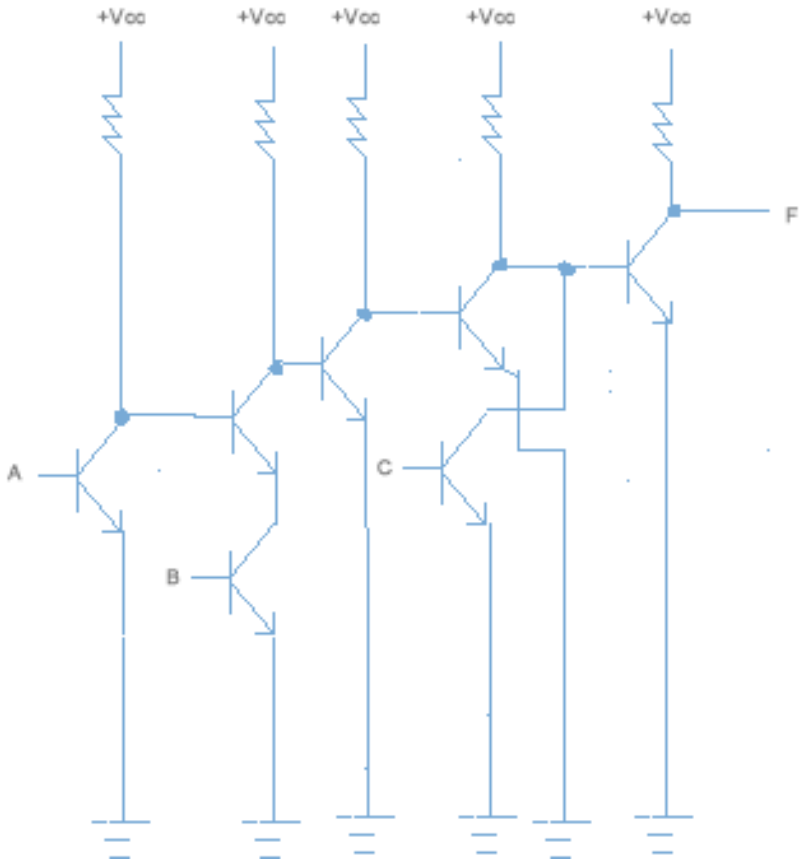
Computer Science 240
Basic Logic
Assignment for Lab 2

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	BC	BC+B'+C'	A(BC+B'+C')	AB	A'B	AB+A'B	B(AB+A'B)	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