

**Computer Science 240**  
Assignment for Lab 6

Refer to the Lab 6 notes and your lecture notes to complete the lab assignment.

1. Write a Boolean function for F using the sum-of-products form:

<u>A</u>	<u>B</u>	<u>C</u>	<u>F</u>
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. Draw a transistor circuit (use transistors, **not** logic gate symbols) to implement  $F = A'B + C$

3. Draw a circuit which implements the function G, using logic gate symbols (**not** transistors) 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.

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

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

A	B	C	BC	(BC+B'+C')	A(BC+B'+C')	AB	A'B	B(AB+A'B)	A(BC+B'+C')+B(AB+A'B)
0	0	0							
0	0	1							
0	1	0							
0	1	1							
1	0	0							
1	0	1							
1	1	0							
1	1	1							

5. 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.

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

$$F = A + B$$