

ET 540 – Introduction to Digital Computing Theory
HOMEWORK # 3 - Boolean Algebra and DeMorgan's Theorem

Student's Name _____

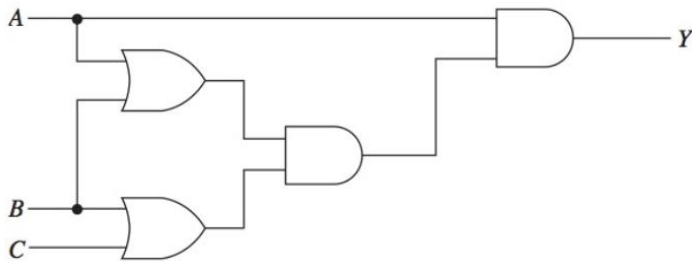
Instructions:

- DUE DATE: Monday, 10/1/18
- Show all work to receive full credit
- Student's Name _____

Boolean Analysis of Logic Circuits

Find the output and use Boolean algebra to simplify the output. Also sketch the simplified circuit.

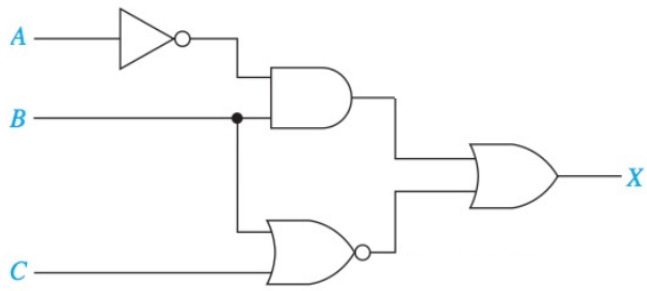
1.



- a. (5 pts) Output Y _____
- b. (10 pts) Simplified output Y _____
- c. (3 pts) Draw the simplified circuit

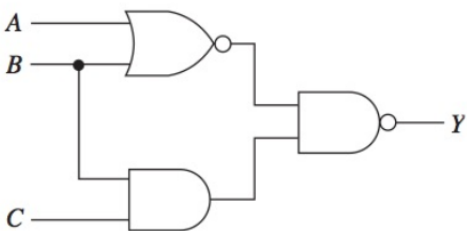
Find the output X and use Boolean algebra and DeMorgan's theorem to simplify the output. Also sketch the simplified circuit.

2.



- (6 pts) Output X _____
- (12 pts) Simplified output X _____
- (3 pts) Draw the simplified circuit

3.



- (6 pts) Output X _____
- (12 pts) Simplified output X _____
- (3 pts) Draw the simplified circuit

4. Simplify the following output using Boolean algebra and/or DeMorgan's techniques (12 pts a-b, 13 pts c-d)

a. $X = AB + (\bar{A} + \bar{B})C + AB$

b. $Z = \bar{A}B + \bar{A}B\bar{C} + \bar{A}BCD + \bar{A}B\bar{C}\bar{D}E$

c. $W = \overline{\overline{A} + B} \cdot BC + \overline{B}C$

d. $Y = \overline{(A + \overline{B})(\overline{C} + D)}$