***CSC 1301 – Spring 2020***

***Homework #1***

**Due 02/04/2020 11:59PM**

***Submission Requirements***

*You must turn work at the SPECIFIED TIME so you can receive credit for Homework!*

*Homework 1* ***must be submitted on icollege*** *by the due date and time. Late homework will be subject to a penalty, as stated in the course grading policy. No email or hard copies of homework will be accepted.*

*You may discuss the assignments with other students in the class, but (as stated in the academic honesty policy) your written answers* ***must be your own****, and you must list the names of other students you discussed the assignment with.*

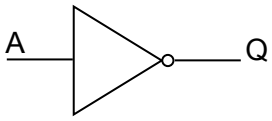
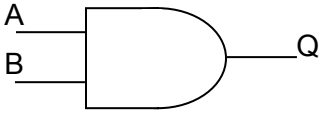
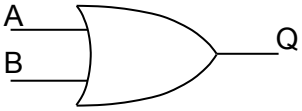
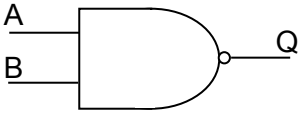
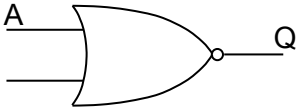
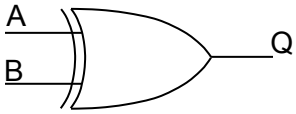
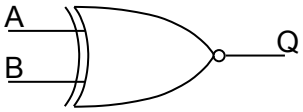
**How to Submit**

Log into **iCollege** (iCollege), select the class to view its drop box folders, select the correct folder for the given assignment and upload the file there.

You will get a confirmation email. Please save the conformation email in the event something goes wrong, for example work was submitted to the wrong folder etc…,

**Feel free to hand draw the gates then use any Scanner app via mobile device such as CamScanner, Tiny Scanner just to name a few. These are a just a small scanner app that turns mobile device into a portable document scanner and scan everything as images or PDFs. Save file as PDF then upload to icollege.**

The following table should remind you of the work we did in class

| Gate | Symbol | Boolean Equation |
|---|---|---|
| NOT |  | $Q = \overline{A}$ |
| AND |  | $Q = A.B$ |
| OR |  | $Q = A + B$ |
| NAND |  | $Q = \overline{A.B}$ |
| NOR |  | $Q = \overline{A + B}$ |
| EXOR |  | $Q = A \oplus B$ **or** $Q = \overline{A}.B + A.\overline{B}$ |
| EXNOR |  | $Q = \overline{A \oplus B}$ **or** $Q = \overline{A}.\overline{B} + A.B$ |

***Gates question 1 – 7 = [44 pts - 7 points each]***

1. Draw an AND gate and list all the possible input values that will cause it to produce a value of 1.

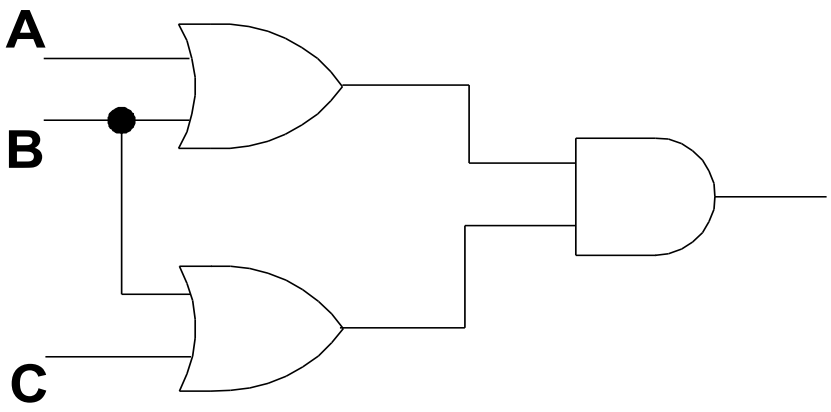
2. Draw an OR gate and list all the possible input values that will cause it to produce a value of 1.

3. Draw an XOR gate and list all the possible input values that will cause it to produce a value of 1.

4. Draw a NOT gate and list all the possible input values that will cause it to produce a value of 1

5. Draw and label the symbol for a TWO-input NOR gate, then show its behavior with a truth table.

6. Show the behavior of the following circuit with a truth table:




| A | B | C |
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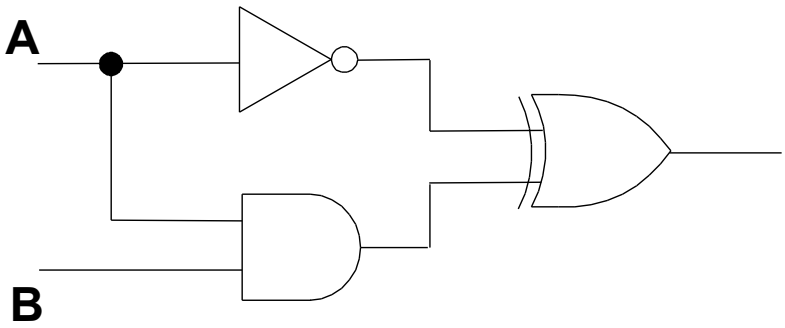
7. Show the behavior of the following circuit with a truth table:




| A | B | Y |
|---|---|---|
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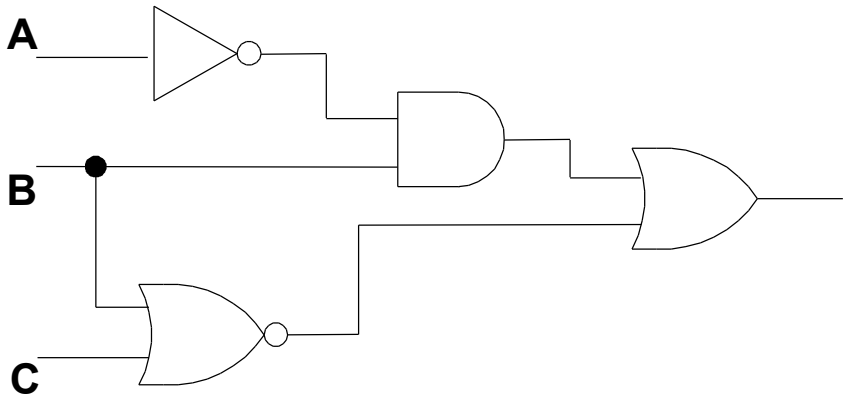
**Questions 8 – 13 = [56 pts – 9.33 points each]**

8. Complete the truth table for the following system. Hint****A'B + (B+C)'

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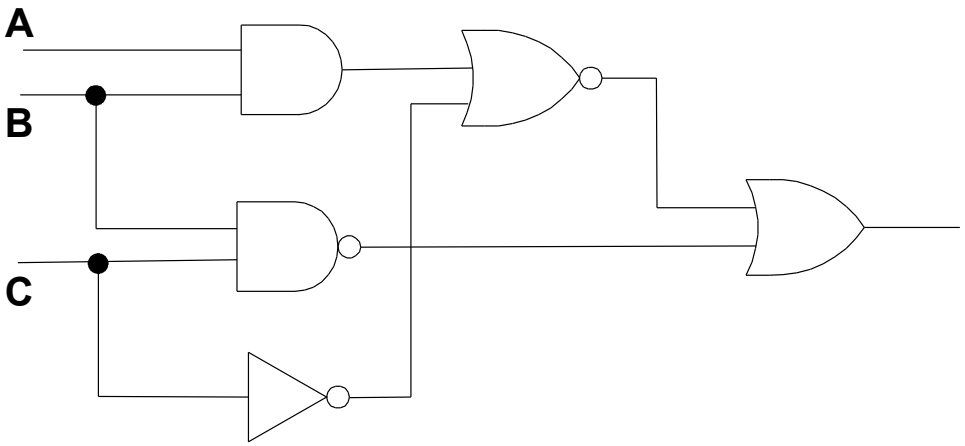
9. Complete the truth table for the following system




| A | B | C | AB | (BC)’ | C’ | (AB+C’)’ | (BC)’ + (AB+C’)’ |
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10. Draw and label the symbol for a TWO-input NAND gate, then show its behavior with a truth table.

11. Draw a circuit diagram corresponding to the following Boolean expression:
(A + B)(B + C)

12. Draw a circuit diagram corresponding to the following Boolean expression:
(AB)’ + (CD)’

13. Draw a circuit diagram corresponding to the following Boolean expression:
(AB + C)D