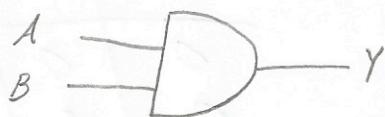


Gates question 1 – 7 = [44 pts - 7 points each]

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



A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

Input: $A=1, B=1$ Output: $Y=1$

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



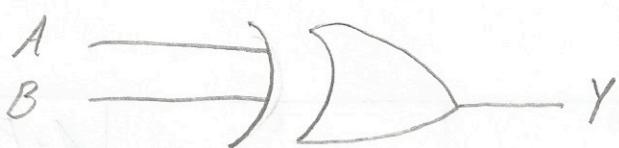
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

Input: $A=0, B=1$ Output: $Y=1$

Input: $A=1, B=0$ Output: $Y=1$

Input: $A=1, B=1$ Output: $Y=1$

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



A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

Input: $A=0, B=1$ Output: $Y=1$

Input: $A=1, B=0$ Output: $Y=1$

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

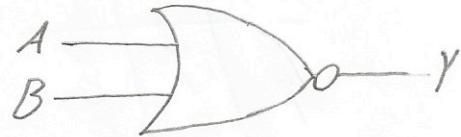


A	Y
0	1
1	0

Input: $A=0$ Output: $Y=1$

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

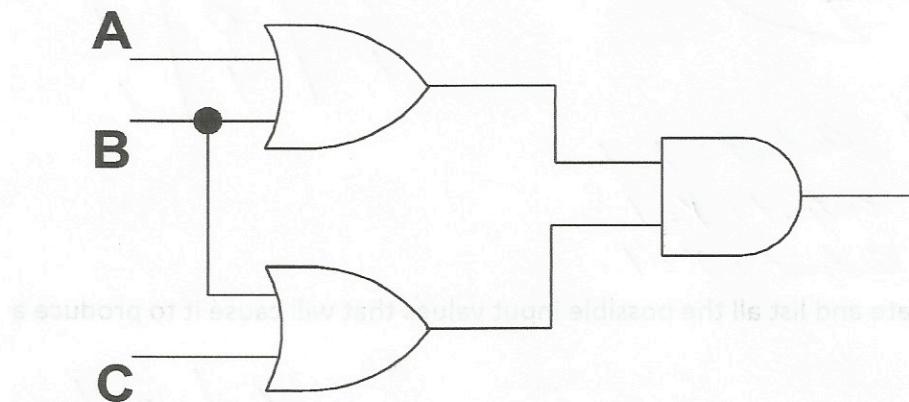
2-input
NOR gate



$$Y = \overline{A + B}$$

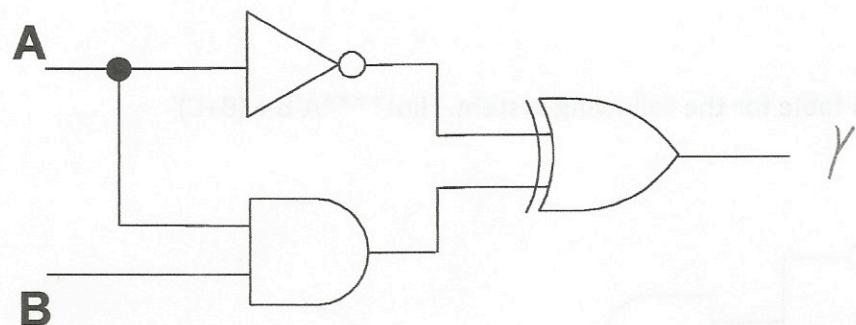
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

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



A	B	C	$A+B$	$B+C$	$(A+B)(B+C)$
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	1	1	1
0	1	1	1	1	1
1	0	0	1	0	0
1	0	1	1	1	1
1	1	0	1	1	1
1	1	1	1	1	1

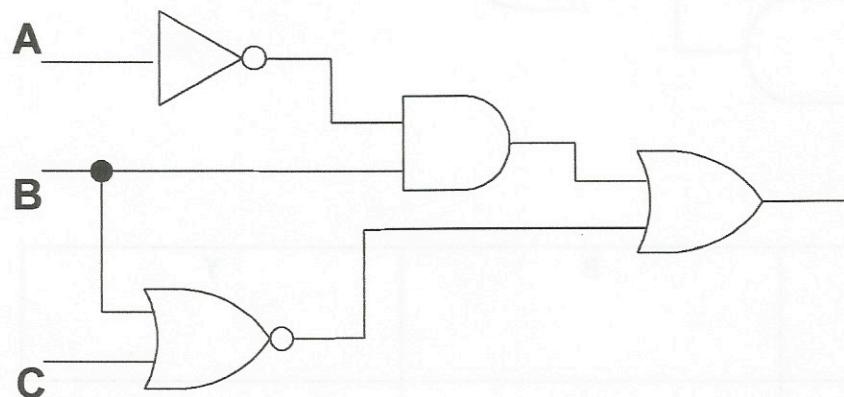
7. Show the behavior of the following circuit with a truth table:



A	B	Y
0	0	1
0	1	1
1	0	0
1	1	1

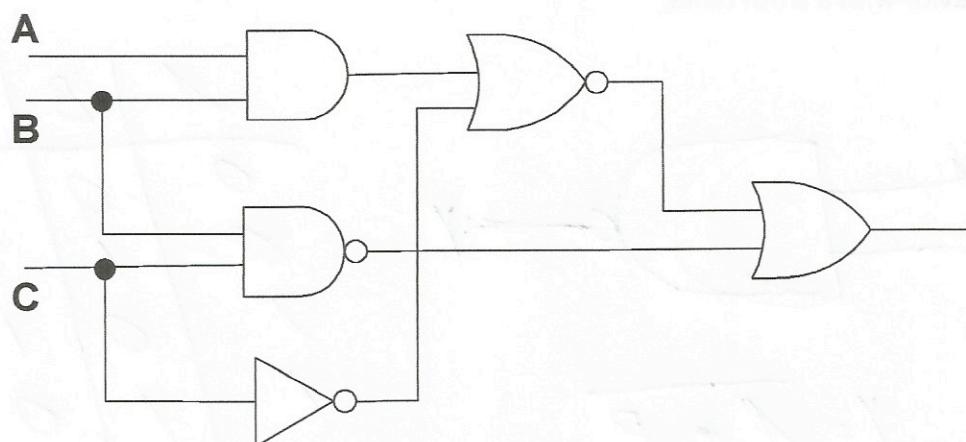
Questions 8 – 13 = [56 pts – 9.33 points each]

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



A	B	C	A'	$A'B$	$(B+C)'$	$A'B+(B+C)'$
0	0	0	1	0	1	1
0	0	1	1	0	0	0
0	1	0	1	1	0	1
0	1	1	1	1	0	1
1	0	0	0	0	1	1
1	0	1	0	0	0	0
1	1	0	0	0	0	0
1	1	1	0	0	0	0

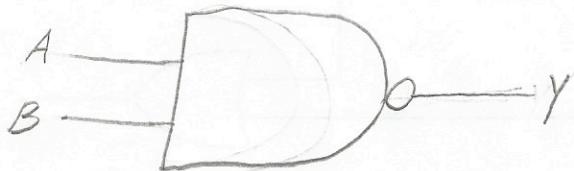
9. Complete the truth table for the following system



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

10. Draw and label the symbol for a TWO-input NAND gate, then show its behavior with a truth table.

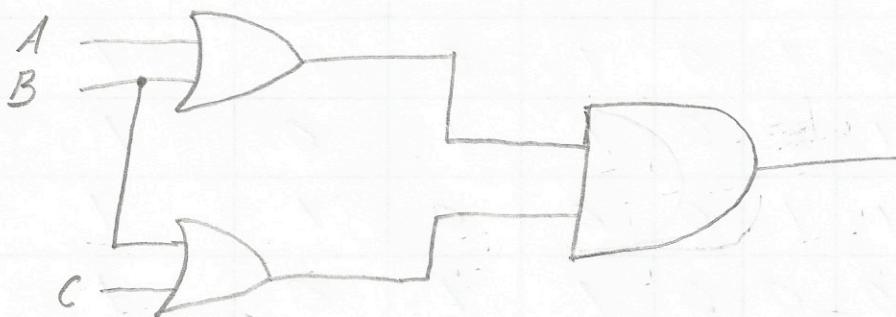
2-input
NAND
gate



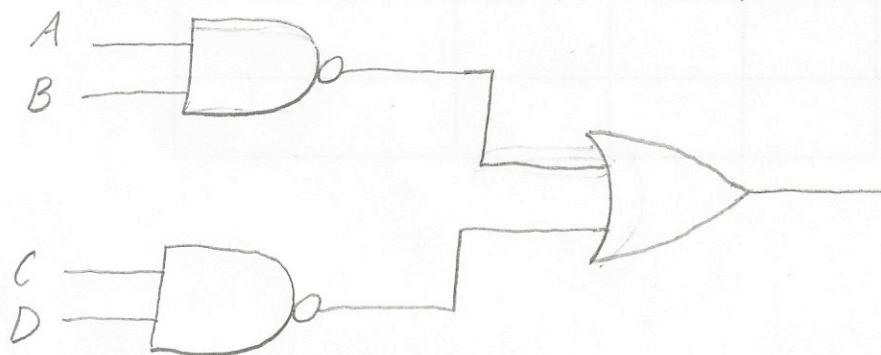
$$Y = \overline{A \cdot B}$$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

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:
 $(AB + C)D$

