

Name: Student ID:

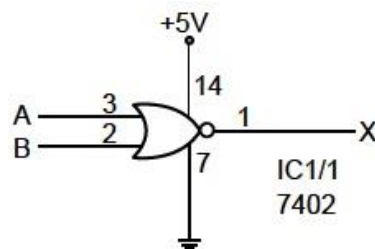
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Laboratory 7

NOR Gate and NAND Gate

1. NOR-Gate:

- 1.1 Connect a logic circuit as shown in the figure below. Use the logic switches to supply input signals as specified. Connect the output signals to the logic monitor and record the results for each input pairs.

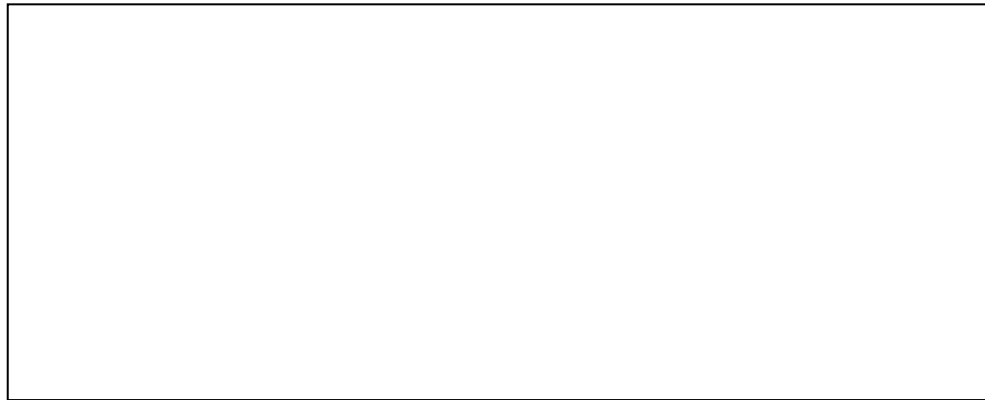


| A | B | X |
|---|---|---|
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

- 1.2 Draw an equivalent circuit of *NOR* gate using basic gates (*AND*, *OR* and *NOT* gates)

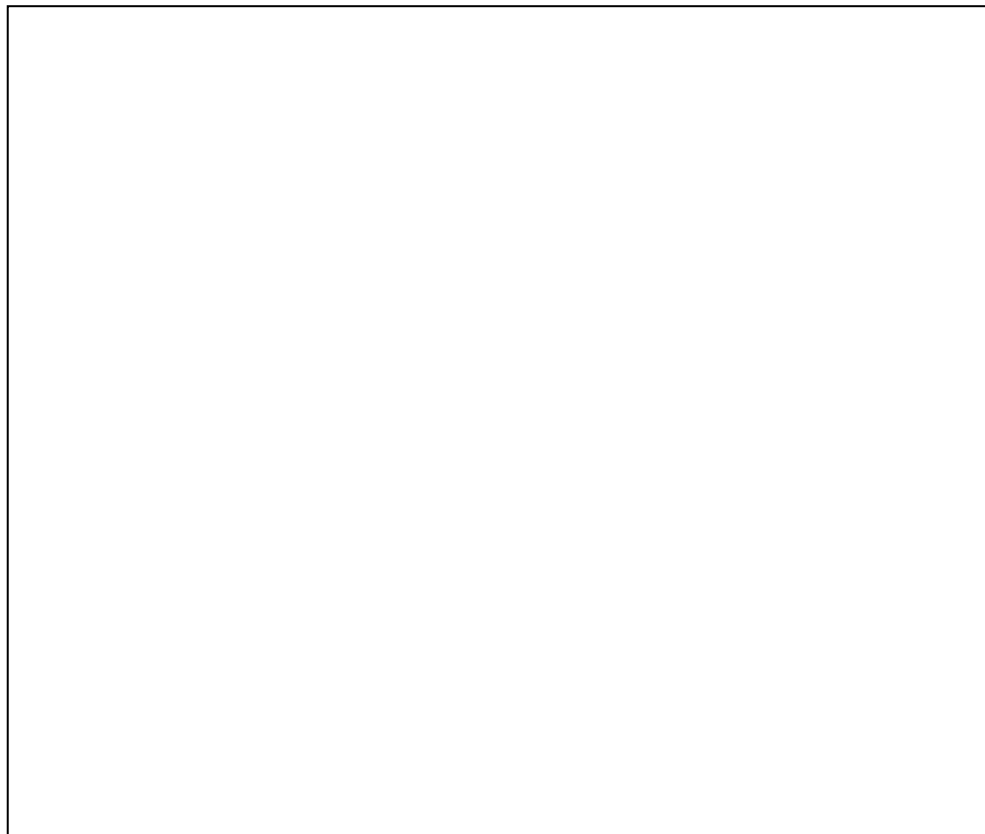
Instructor's signature

1.3 Draw and construct a *NOT* gate using only *NOR* gate. Prove your answer using Boolean algebra.



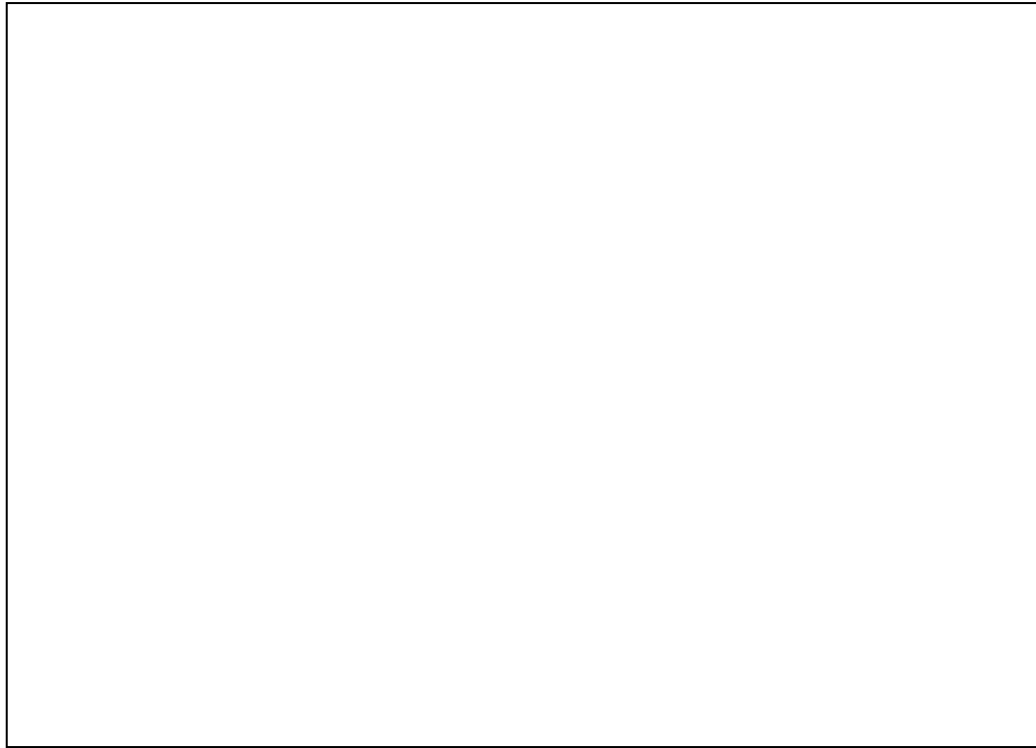
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1.4 Draw and construct an *AND* gate using only *NOR* gate. Prove your answer using Boolean algebra.



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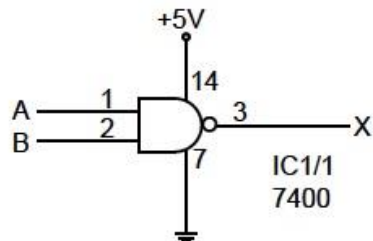
1.5 Draw and construct an *OR* gate using only *NOR* gate. Prove your answer using Boolean algebra.



Instructor's signature

2. NAND-Gate:

2.1 Connect a logic circuit as shown in the figure below. Use the logic switches to supply input signals as specified. Connect the output signals to the logic monitor and record the results for each input pairs.

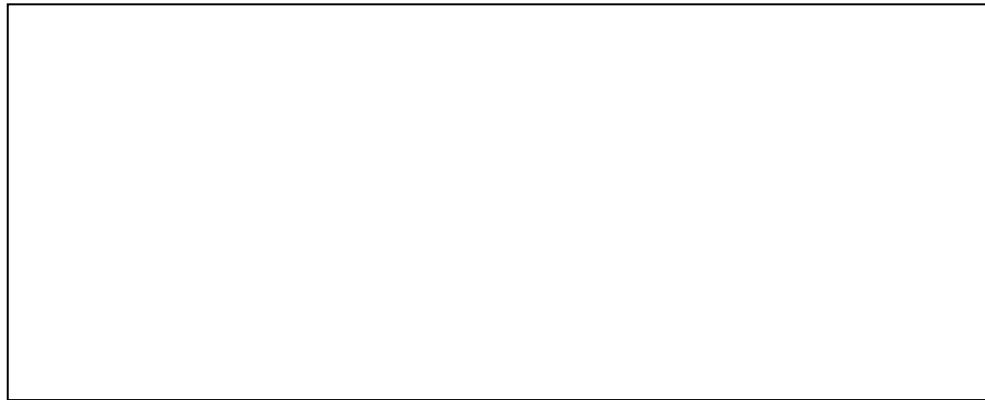


| A | B | X |
|---|---|---|
| 0 | 0 | |
| 0 | 1 | |
| 1 | 0 | |
| 1 | 1 | |

2.2 Draw an equivalent circuit of *NAND* gate using basic gate (*AND*, *OR* and *NOT* gates)

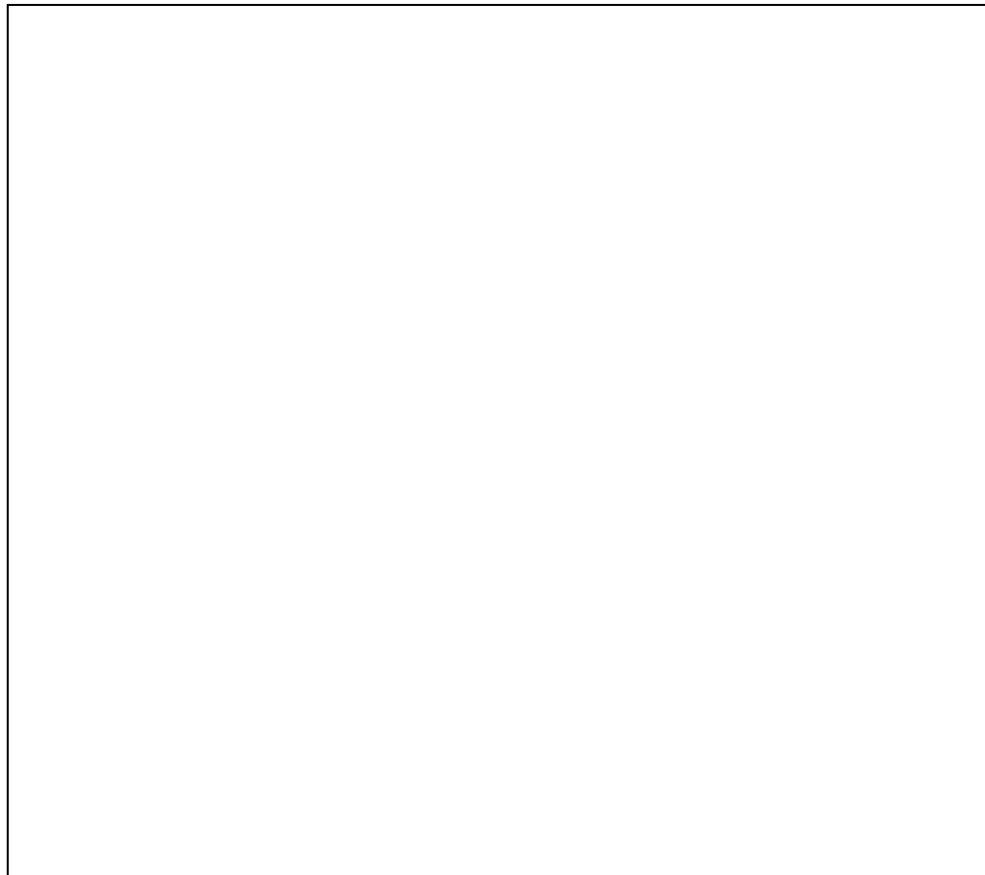
Instructor's signature

2.3 Draw and construct a *NOT* gate using only *NAND* gate. Prove your answer using Boolean algebra.



Instructor's signature

2.4 Draw and construct an *AND* gate using only *NAND* gate. Prove your answer using Boolean algebra.



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2.5 Draw and construct an *OR* gate using only *NAND* gate. Prove your answer using Boolean algebra.

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3. Assignments

3.1 Build a *NOR* gate using only *NAND* gates.

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3.2 Build a *NAND* gate using only *NOR* gates

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3.3 Build *XOR* gate using only *NAND* gates

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3.4 Build half adder circuit using NAND and NOR gates

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Logic Diagram of frequently used gates