**Applications of Boolean algebra**

**Objective:**

* To investigate the rules of Boolean algebra.
* To gain experience working with practical circuits
* To simplify a complex function using Boolean algebra

**Required Components and Equipments:**

* Logic State
* 4 NAND Gate
* Logic Probe(big)

**Experimental Setup (You must draw the IC configurations)**



**Results:**

Truth table:

|  |  |  |
| --- | --- | --- |
| **A** | **B** | **A⊕B** |
| **0** | **0** | **0** |
| **0** | **1** | **1** |
| **1** | **0** | **1** |
| **1** | **1** | **0** |

**Discussions:**

After launching into Proteus 8 I went to P(Parts), Searched for simulator primitives. From simulator primitives I added the NAND gate. I also added logic state and logic probe(big) from parts. After that, I placed two logic states in my IC(A, B) to pass my inputs and connected (A, B) in a NAND gate(gate1). Than connected A and gate1 with another NAND gate(gate2). After that I connected B and gate1 with another NAND gate(gate3). Finally, I added gate2 and gate3 with my final NAND gate(gate4). Lastly, I connected a logic prob(big) with the last NAND gate(gate4) to see my expected output.

Boolean Equation for the output: ( (A(AB)')' ((AB)'B)' ) '

Simplify the Boolean equation:



The circuit’s function is identical to an XOR Gate. Like the XOR gate, it gives 0 when both of the inputs are the same,1 otherwise.