CSE260 Lab Report

Experiment Name: Application of Boolean algebra

Submitted by

Name: Tahsin Ashrafee Susmit

ID: 20301088

Section: 09

Date: 10/07/21

Captain

Date :.....

Name of the experiment: Application of Boolean algebra

Objective:

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

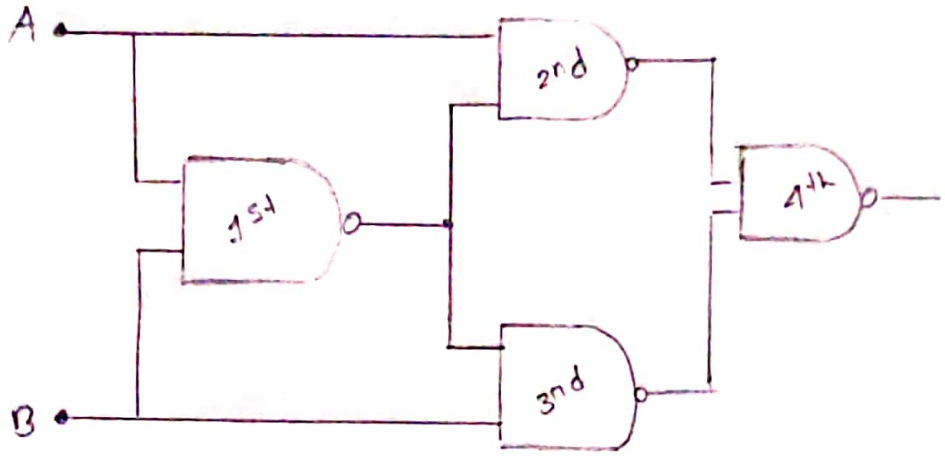
Required Components and Equipments:

1. AT 700 portable Analog / Digital Laboratory
2. 7400 x 1

In proteus we need:

1. Logic Probe
2. Logic state
3. NAND
4. XOR

Experimental Setup :



Result :

Truth Table :

A	B	Output
0	0	0
0	1	1
1	0	1
1	1	0

The Bodean equation for the output

(I) For 1st gate - $(A \cdot B)'$

(II) For 2nd gate - $(A \cdot (A \cdot B)')'$

(III) For 3rd gate - $(B \cdot (A \cdot B)')'$

(IV) For 4th gate - $((A \cdot (A \cdot B)')' \cdot (B \cdot (A \cdot B)')')'$

Simplify the equation :

$$((A \cdot (A \cdot B)')' \cdot (B \cdot (A \cdot B)')')'$$

$$= (A \cdot (A \cdot B)')'' + (B \cdot (A \cdot B)')''$$

$$= A \cdot (A' + B') + B \cdot (A' + B')$$

$$= A \cdot A' + AB' + BA' + BB'$$

$$= AB' + BA'$$

The circuits function is identical to XOR gate.

Discussion:

Two inputs A and B are connected to 1st NAND gate and also simultionously connected to 2nd and 3rd NAND gates including one output from the 1st NAND gate. Next, the output of 3rd and 2th NAND gates are connected with the 4th NAND gate. If odd number of input "one" is given output returns as "one". It acts like XOR gate.