CSE 260 LAB REPORT

Experiment Name: Applications of Boolean Algebra

Submitted By

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2010402

Section: 11

Date: 19-03-2021

Name of Experiment: Applications of Boolean Algebra

Objective:

i) To investigate the rules of Boolean Algebra

ii) Gain Experience working with practical circuits.

iii) Simplify a complex function using Boolean Algebra.

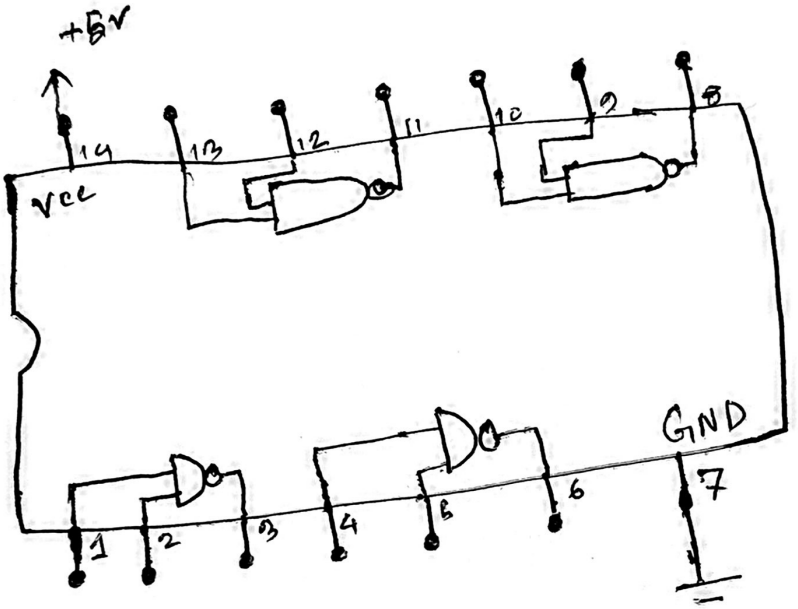
Required Components & Equipments:

1. AT-700 Portable Analog/Digital Laboratory

2. 7400X1

Experimental Setup:

NAND Gate Based Logic IC:



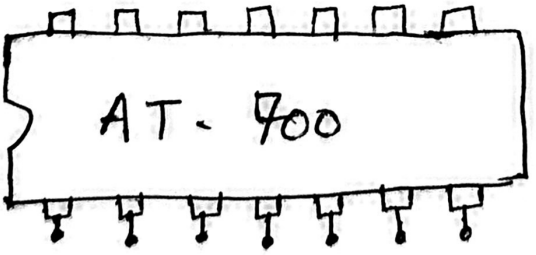
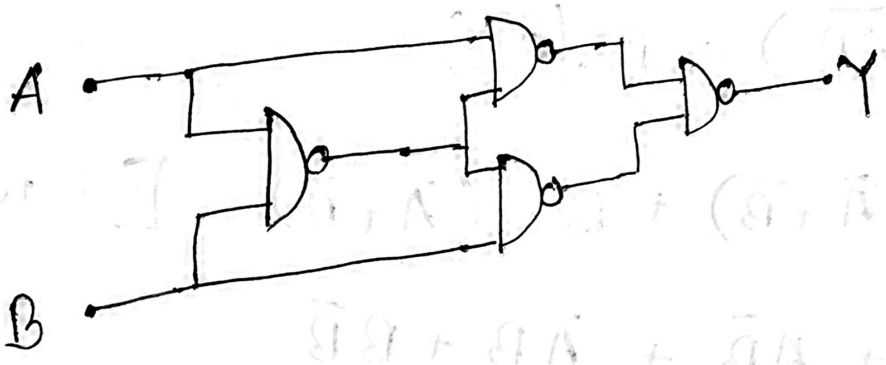


Diagram of the circuit:



Results (Truth table) and Discussion:

Truth table:

A	B	$\bar{A}$	$\bar{B}$	$\overline{(\overline{A \cdot \overline{(AB)}}) \cdot (\overline{B \cdot \overline{(AB)}})}$
0	0	1	1	0
0	1	1	0	1
1	0	0	1	1
1	1	0	0	0

During the experiment, I noticed 4 Nand gates in the IC. Each of it has 2 inputs. The final equation was: $\overline{(\overline{A \cdot \overline{(AB)}}) \cdot (\overline{B \cdot \overline{(AB)}})}$

Simplification:

$$\overline{\left(\overline{(A \cdot \overline{AB})} \cdot \overline{(B \cdot \overline{AB})}\right)}$$

$$= \overline{\overline{(A \cdot \overline{AB})}} + \overline{\overline{(B \cdot \overline{AB})}} \quad [\text{Demorgans theorem}]$$

$$= A \cdot (\overline{AB}) + B \cdot (\overline{AB}) \quad [\because]$$

$$= A \cdot (\bar{A} + \bar{B}) + B \cdot (\bar{A} + \bar{B})$$

$$= A\bar{A} + A\bar{B} + \bar{A}B + B\bar{B}$$

$$= 0 + A\bar{B} + \bar{A}B + 0$$

$$= \bar{A}B + A\bar{B}$$

∴ We can see that the circuits function is identical to X-OR gate.