Experiment-2

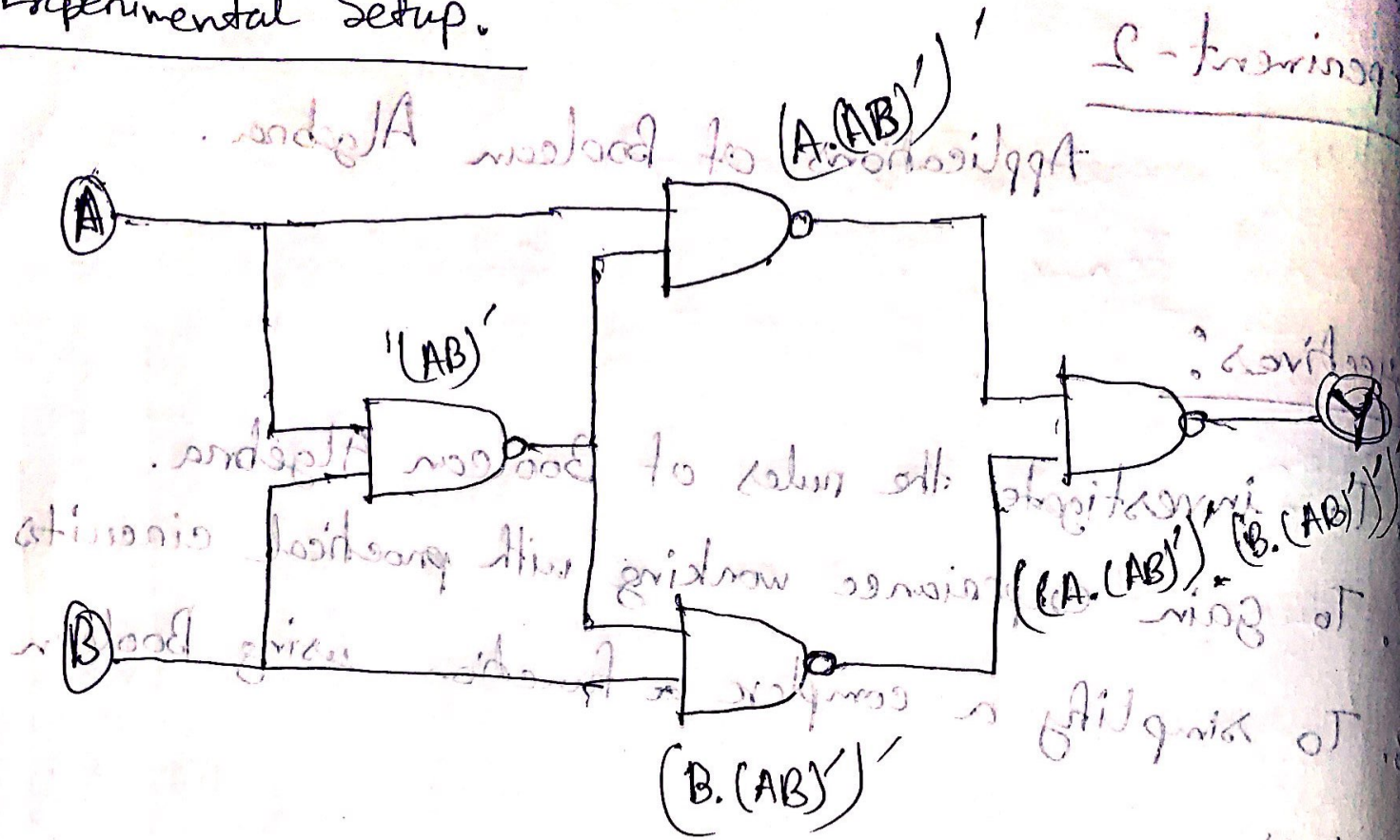## Applications of Boolean Algebra.

Objectives:

1. To investigate the rules of Boolean Algebra.

2. To gain experiance wonking with practical circuits

3. To simplify a complex a function using Boolean algebra

Required components:

→ NAND gate

→ LOGICSTATE

→ LOGICPROBE

→ LED - BLUE

Truth Table:

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

Experimental Setup:

Circuit diagram labels: A, B, (AB)', (A.(AB))', (B.(AB))', ((A.(AB))'.(B.(AB))'), Y

Truth Table:

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

~~NAND~~

Result:

The output Boolean equation is:

$$Y = ((A \cdot (AB)')' \cdot (B \cdot (AB)')')'$$

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

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

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

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

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

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

$$= A \oplus B$$

Discussion:

The output of this gate works similarly as XOR gate.