CSE260 LAB Report

Experiment name:- Applications of Boolean Algebra.

Submitted by

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Section : 10

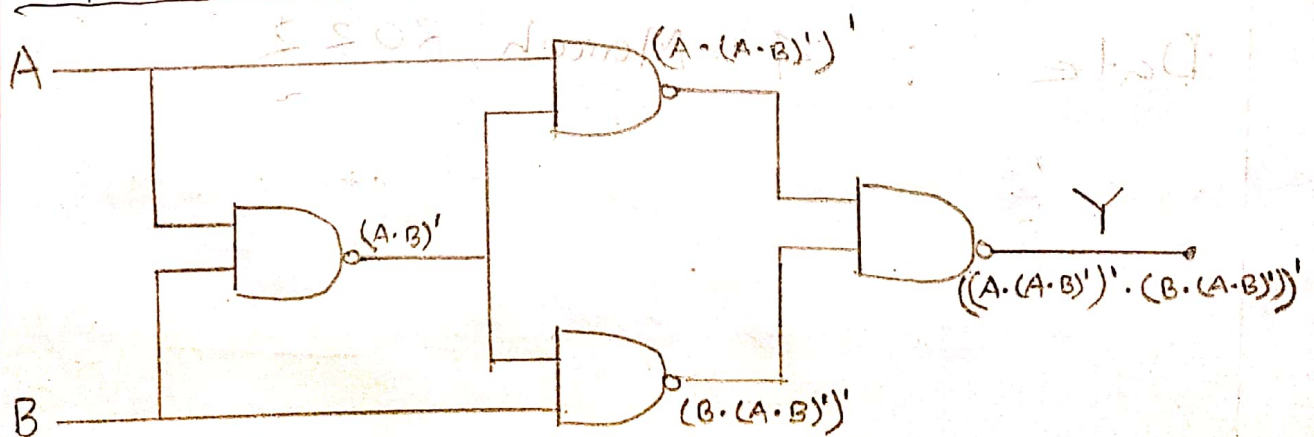Date : 4 March, 2022.

Objectives:-

① To investigate the rules of Boolean algebra.

⑪ To gain experience working with practical circuits.

⑪⑪ To simplify a complex function using Boolean Algebra.

Required Components and Equipments:-

Breadboard, wires, power source, AT-700 Portable Analog/Digital Laboratory, IC-7400, etc.

Experimental setup:-

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

$(A \cdot B)'$

Y

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

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

⊕ Constructing this figure on the breadboard of AT-700 with IC-7400 (s). Each IC's pin 14 is connected to +5V position of DC power supply and pin 7 is connected to GND position of AT-700. Now, connecting the inputs to Data switches and outputs to any position of LED Display, we should find out all the possible combinations and write them down in input-output tabular form (Truth Table).

Results and Discussions:-

Input		Output
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

∴ Boolean Equation for the output,

$$Y = \left((A \cdot (A \cdot B)')' \cdot (B \cdot (A \cdot B)')' \right)'$$

Simplifying the equation,

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

$$= (A \cdot (A \cdot B)')'' + (B \cdot (A \cdot B)')'' \qquad [\because (x \cdot z)' = x' + z']$$

$$= (A \cdot (A \cdot B)') + (B \cdot (A \cdot B)') \qquad [\because x'' = x]$$

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

$$= AA' + AB' + A'B + BB' \qquad [\because w \cdot (x + z) = wx + wz]$$

$$= 0 + AB' + A'B + 0 \qquad [\because x \cdot x' = 0]$$

$$= AB' + A'B \qquad [\because x + 0 = x]$$

$$\therefore Y = AB' + A'B = A \oplus B$$

The circuits function is identical to a single gate and that is XOR gate.