

CSE 260 LAB ASSIGNMENT 2

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SECTION: 06

LAB ASSIGNMENT 2

Super Report

(1) Name of the Experiment:
Applications of Boolean Algebra.

(2) Objective:

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

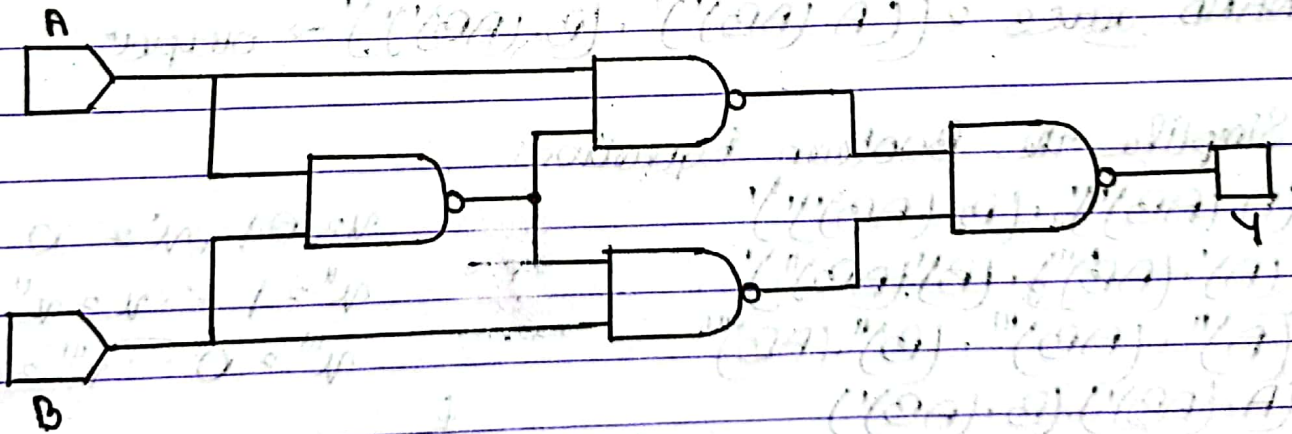
(3) Required components and equipments:

NAND

LOGIC PROBE

LOGIC STATE

(4) Experimental Setup



(5) Results (Truth Tables) and Discussions.

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

• Boolean Equation for output.

Boolean Equations:—

For the 1st NAND gate connected with A and B
 $= (A \cdot B)'$

For the 2nd NAND gate connected with A and 1st
NAND gate $= (A \cdot (AB)')'$

For the 3rd NAND gate connected with B and 1st
NAND gate $= (B \cdot (AB)')'$

For the last NAND gate connected with 2nd and 3rd
NAND gates $= ((A \cdot (AB)')') \cdot (B \cdot (AB)')')' \rightarrow \text{output}$

• Simplify the Boolean Equation

$$\begin{aligned}
 & ((A \cdot (AB)')') \cdot (B \cdot (AB)')')' \\
 &= ((A \cdot (AB)')') + (B \cdot (AB)')')' \\
 &= ((A \cdot (A' + B'))' + (B \cdot (A' + B'))')' \\
 &= ((AA' + AB)') + (A'B + BB')' \\
 &= ((0 + AB)') + (A'B + 0)' \\
 &= ((AB)') + (A'B)' \\
 &= (A' \cdot B'' + A'' \cdot B')' \\
 &= (A'B + AB)' \\
 &= (A'B)' + (AB)' \\
 &= AB' + A'B \\
 &\therefore ((A \cdot (AB)')') \cdot (B \cdot (AB)')')' = \underline{\underline{AB' + A'B}} \text{ (Ans)}
 \end{aligned}$$

$$[(x+y)' = x' + y']$$

$$[x \cdot x' = 0]$$

$$\begin{aligned}
 & \text{[if } x=1, x'=0, x''=1 \\
 & \quad x=x''=1 \\
 & \quad x'=x'''=0]
 \end{aligned}$$

• The circuit's function is identical to a single gate.
Write down the name of the gate.
XOR (Ans)