Name of the Experiment: Universal Gates and Applications of Boolean algebra.

Objective: In this experiment, we are ~~sog~~ investigating the rules of Boolean Algebra. This help us to gain expericence dealing with practical circuits and learn how to simplify complex function using Boolean algebra.

Components: AT - 700

7400 x1

Experimental setup:

Result: For diagram 1

$$A \cdot \overline{AB} \cdot B \cdot \overline{AB}$$

For diagram 2

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

Experimental setup:

Diagram - 1:

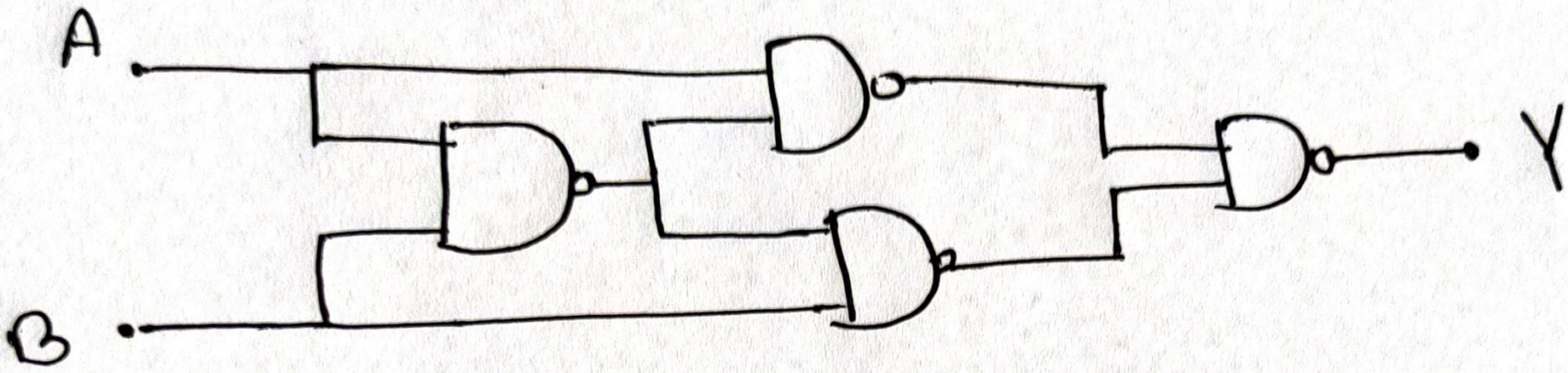
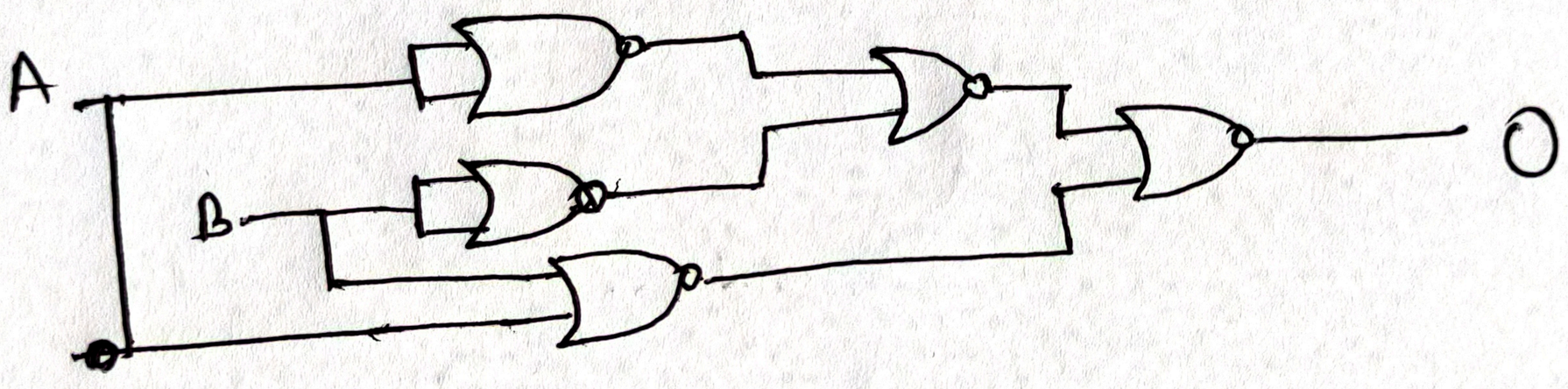


Diagram - 2:



$\not{A} + \not{B}$

$A \cdot \overline{AB} + B \cdot \overline{AB}$

$A \cdot \overline{AB} + B \cdot A\overline{B}$

$A(\overline{A} + \overline{B}) + B(\overline{A} + \overline{B})$

$A \cdot \overline{A} + A \cdot \overline{B} + B\overline{A} + B \cdot \overline{B}$

$0 + A \cdot \overline{B} + B \cdot \overline{A} + 0$

$A \cdot \overline{B} + B \cdot \overline{A}$

$\therefore$ XOR gate

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

$\not{A} \; ? \; \not{B} + \overline{A+B}$

$A \cdot B + \overline{A} \cdot \overline{B}$

XNOR

$\therefore$ ~~XNOR~~ gate.

	B	$A \cdot \overline{B} + B \cdot \overline{A}$
0	0	0
0	1	1
1	0	1
1	1	0

A	B	$\overline{A \cdot B + \overline{A} \cdot \overline{B}}$
0	0	1
1	0	0
0	1	0
1	1	1

- Implement the following function using NAND gate only: (A(AB+CD))'. Do not simplify the function. Draw the diagram only.