NAME:-

Experiment-1

Date :- 24-12-2020

ROLL NO:-

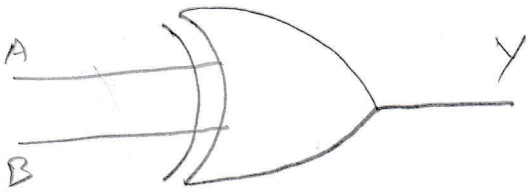
Aim :- To Verify XOR Gate Using NAND Gate.

Software used:-

1. Logisim software

Truth Table:-

Truth table for XOR Gate

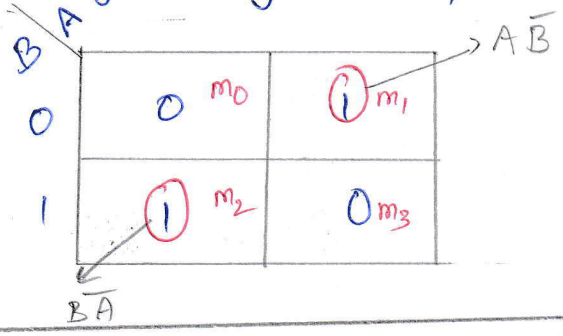


Logic Symbol

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

Boolean Expression:-

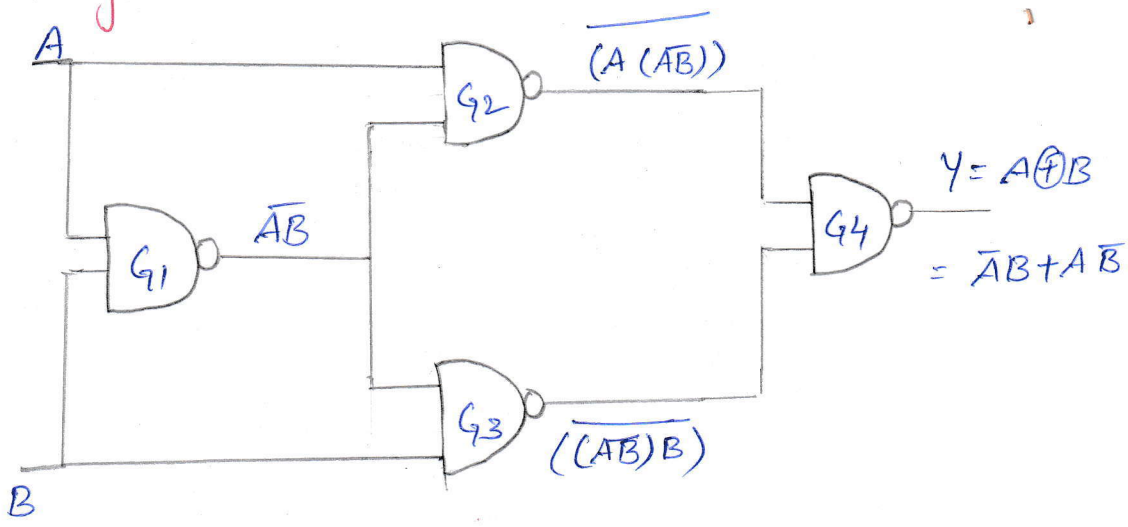
Now by using K-map for Y



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

$Y = A \oplus B$

Logic Diagram:-



Checking of the Circuit:

Case (i) If A = "0" and B = "0" then Y = "0"

by substituting in equation "y"

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

Case(ii) If A = "0" and B = "1" then Y = "1"

by substituting in equation "y"

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

Conclusion: The XOR Gate using Nand circuit is simulated in logisim and is verified with the inputs, shown in the truth table.