ECE132: Basic Electrical and Electronics Engineering Lab

Experiment 9:

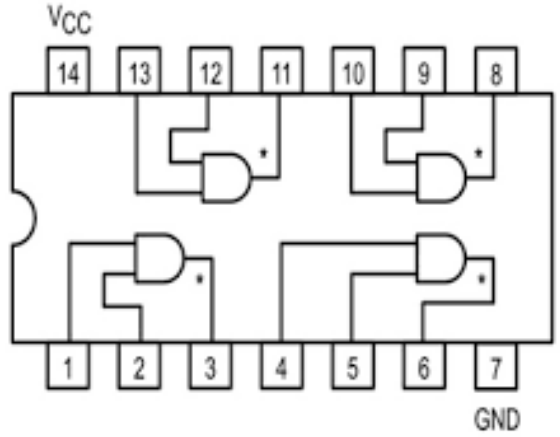
To understand Truth table of Logic gates and verifying the Boolean equations.

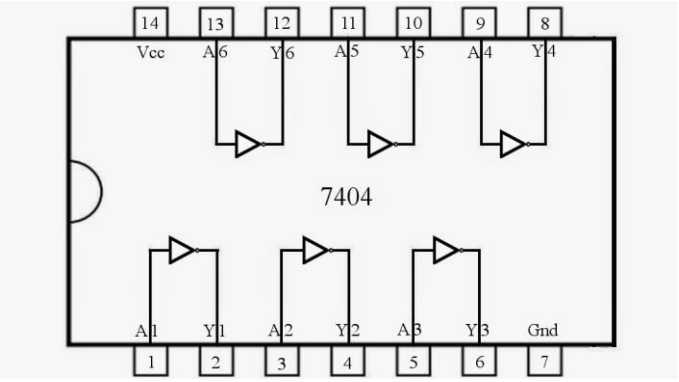
Introduction to Logic Gates

- Logic gates are the basic building blocks of any digital system. It is an electronic circuit having one or more than one input and only one output. The relationship between the input and the output is based on a certain logic. Based on this, logic gates are named as AND gate, OR gate, NOT gate etc.

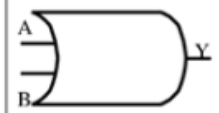
Introduction to Logic Gates

Sr. No.	Component	Specification
1	AND Gate	IC7408
2	OR Gate	IC 7432
3	NOT Gate	IC7404
4	NAND Gate	IC7400
5	NOR Gate	IC7402
6	XOR Gate	IC7486

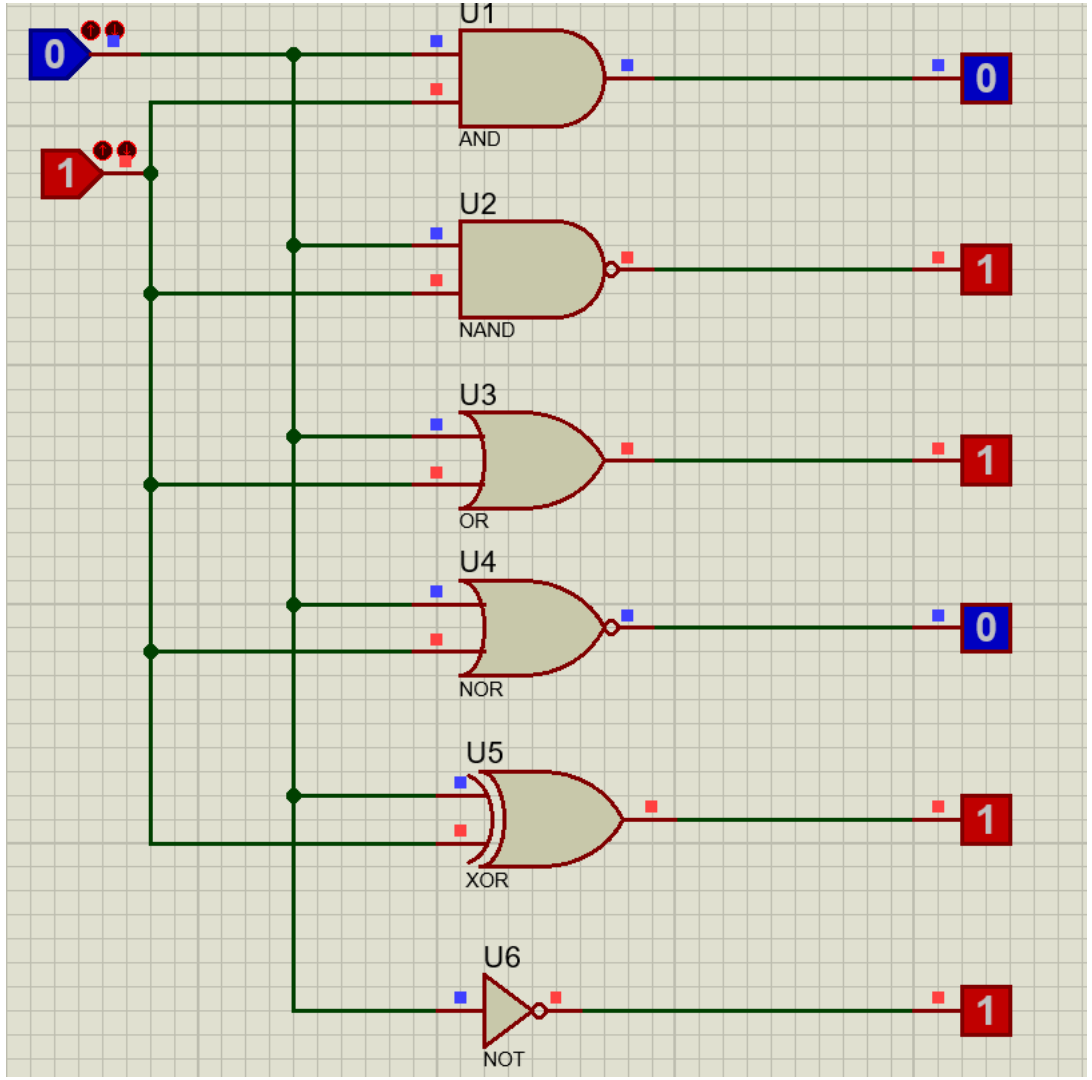




Introduction to Logic Gates

Logic	Schematic	Boolean Expression	Truth Table	English Expression
AND		$A \bullet B = Y$	A B Y 0 0 0 1 1 0 1 1	The only time the output is positive is when all the inputs are positive.
OR		$A + B = Y$	A B Y 0 0 0 1 1 0 1 1	The output will be positive when any one or all inputs are positive.
XOR		$A \oplus B = Y$	A B Y 0 0 0 1 1 0 1 1	The only time the output is positive is when the inputs are not the same.
NOT		$\bar{A} = Y$	A Y 0 1	The output is the opposite of the input.
NAND		$\overline{A \bullet B} = Y$	A B Y 0 0 0 1 1 0 1 1	The output is positive provided all the inputs are not positive.
NOR		$\overline{A + B} = Y$	A B Y 0 0 0 1 1 0 1 1	The only time the output is positive is when all the inputs are negative.

Simulation



Observation and Calculation

Truth Table

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

THANKS TO ALL