

Experiment – 2

Aim of the experiment – To implement all basic gates using universal gate.

Objective – To verify the truth table of all designed logic gates.

Apparatus required -

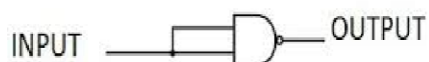
SERIAL NO.	ITEM REQUIRED	SPECIFICATION
01	Bread Board	
02	IC's- NAND gate (7400) NOR gate (7402)	Quad two input NAND gate Quad two input NOR gate
03	Connecting wires	

THEORY –

Universal gates: - A universal gate is a gate which can implement any Boolean function without need to use any other gate type.

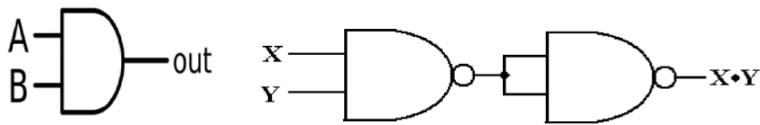
NAND & NOR gates are universal gates.

1. NOT gate: If A is the input, then output of NOT gate $Y = (A)'$
TRUTH TABLE:



INPUT	OUTPUT
A	Y
0	1
1	0

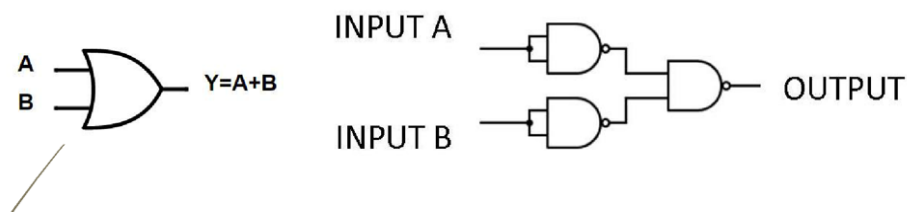
2.AND gate: If X& Y are inputs, then output is $Z = X \cdot Y = ((X \cdot Y)')'$



INPUT		OUTPUT
X	Y	$Z = X \cdot Y$
0	0	0
0	1	0
1	0	0
1	1	1

3.OR GATE- if A and B are inputs then outputs is $y = A + B$.

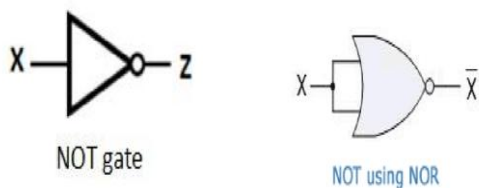
TRUTH TABLE:



INPUT		OUTPUT
A	B	$Y = A' \cdot B'$
0	0	0
0	1	1
1	0	1
1	1	1

*Implementation of basic gates using NOR gate -

1.NOT gate – If A is the input then $Y = A'$



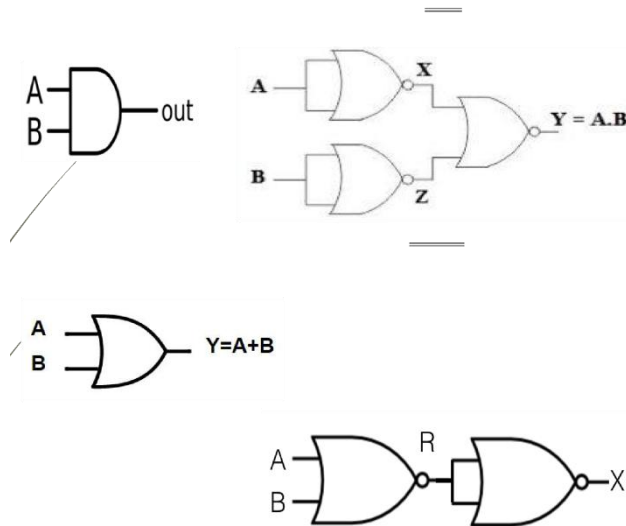
INPUT	OUTPUT
A	Y
0	1
1	0

2. AND gate- Here the output is $Y = A \cdot B$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

3. OR gate-here the output is $Y=A+B$.

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1



OBSERVATION TABLE-

Write down the truth tables in high and low format with the measured output voltages.

Conclusion-

Hence the truth table of all the basic gates were verified using universal gates.