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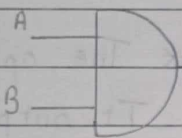
Experiment - 1 : Basic Gates

Aim To study all different types of basic gates

Apparatus TinkerCad

Components 330 Ω resistor, led, 5V power supply, breadboard, input pins, IC7408, IC7432, IC7404, IC7400, IC7402, IC7486

Description 1) AND Gate [IC7408]

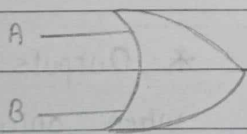


$$Y = A \cdot B$$

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

* Outputs a high signal only when both input signals are high, otherwise outputs low signal (0)

2) OR Gate : [IC7432]

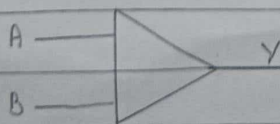


$$Y = A + B$$

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

* Outputs high signal if atleast one input signal is high, otherwise, it outputs low signal (0)

3) NOT Gate : [IC7404]

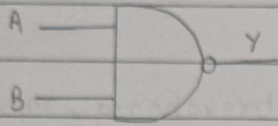


$$Y = \bar{A}$$

A	Y
0	1
1	0

* Inverts the input signal i.e high to low and vice-versa

4) NAND Gate: [IC7400]

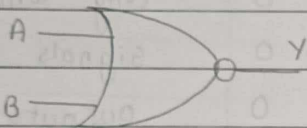


$$Y = \overline{A \cdot B}$$

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

* NAND gate is the opposite of AND gate. It outputs low signal when both input are high, otherwise, outputs high signal.

5) NOR Gate: [IC7402]

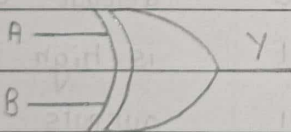


$$Y = \overline{A + B}$$

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

* The opposite of OR gate. It outputs low signal if atleast one input signal is high, otherwise its outputs high signal.

6) Exclusive - OR (XOR): [IC7486]



$$Y = A \oplus B$$

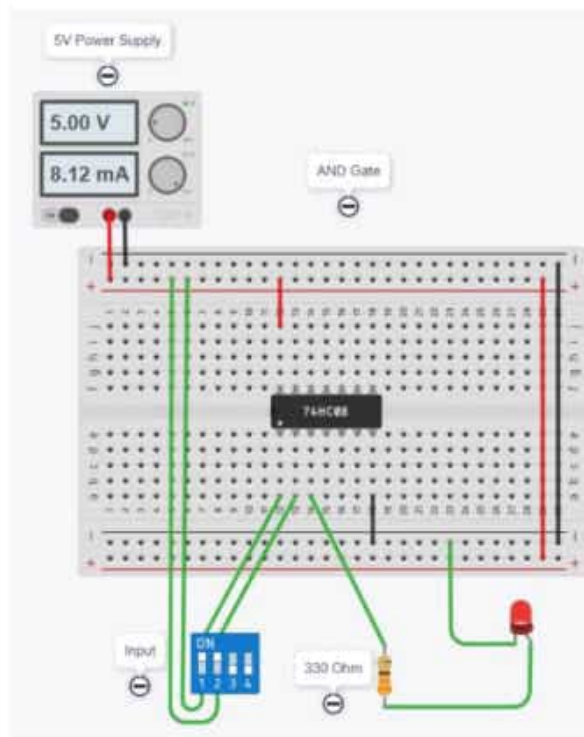
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

* Outputs high signal when only one of the inputs is high, otherwise outputs low signal.

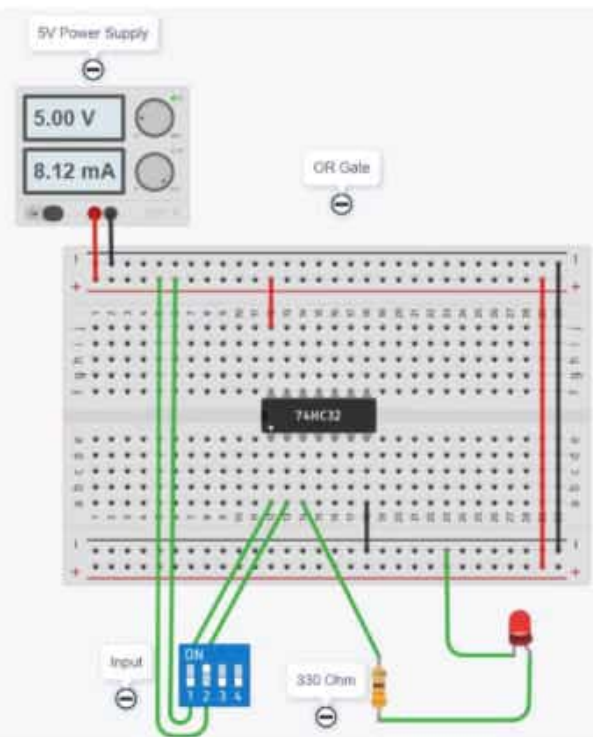
Conclusion

Implementation of all the basic gates have been successfully understood.

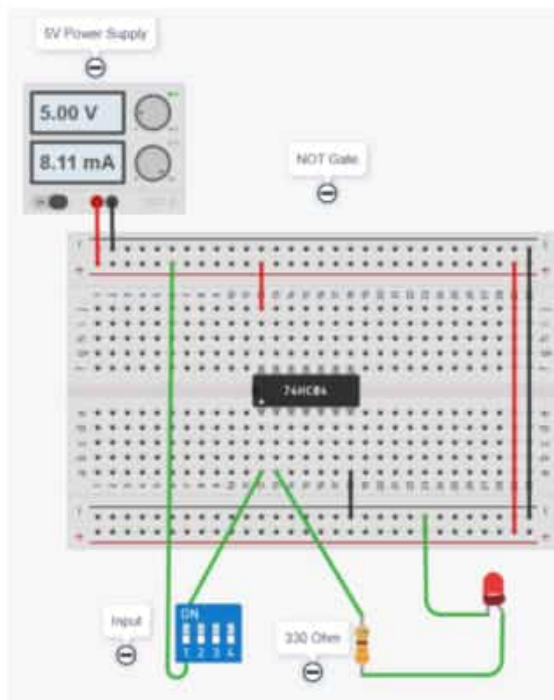
AND GATE



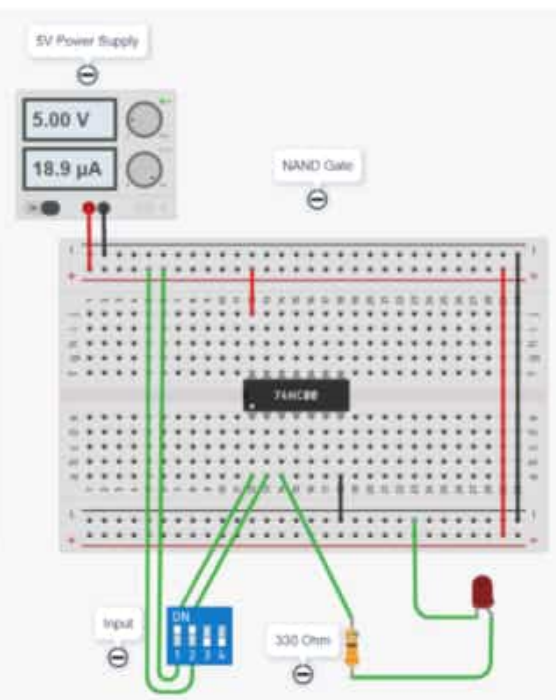
OR GATE



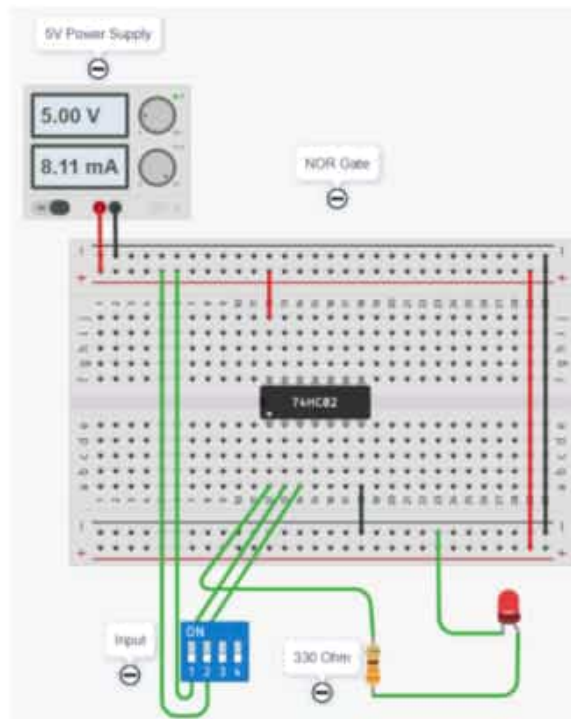
NOT GATE



NAND GATE



NOR GATE



XOR GATE

