Al-Mamoon University

College of Science

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EX (2):

OR GATE

By:

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The purpose of the experiment

Learn about the function of the OR gate by using diodes.

Gate symbol

It is as shown in the figure below:

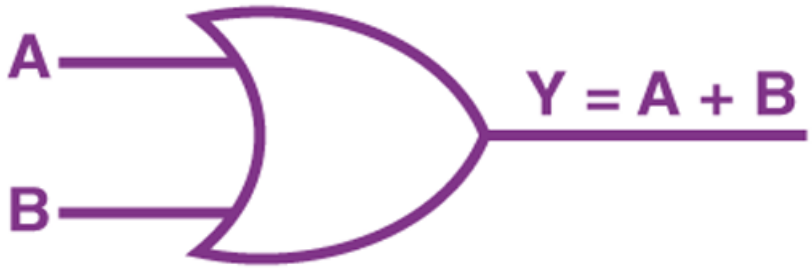

Figure 1

Number of possibilities

The number of input possibilities for the gate is determined using the following relationship:

$$\text{number of possibilities} = 2^n$$

where (n) is the number of entries.

Logical equation:

$$Y=A+B$$

Physical Principle

The logical symbol for a two-input (OR) gate is shown in Figure (1), where both A and B are considered two entrances to the gate, and Y is an exit to the gate. The electrical circuit of an (OR) gate can be represented in the figure number (2), where we notice that the lamp is in the ON state (when one or both of the switches are closed together), conversely, the lamp is in the OFF state if both keys are opened together.

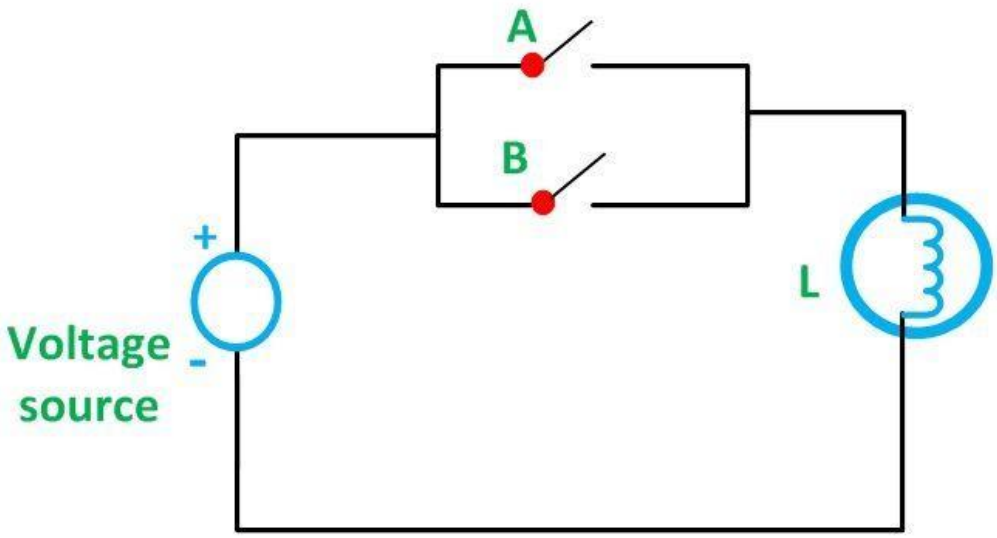

Figure 2

A two-entry (OR) gate can be described by the following truth table :

Table 1

Input		Output
A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

Devices used

- Diodes
- DC Power supply (5V)
- Resistance (1KΩ)
- LED Diode

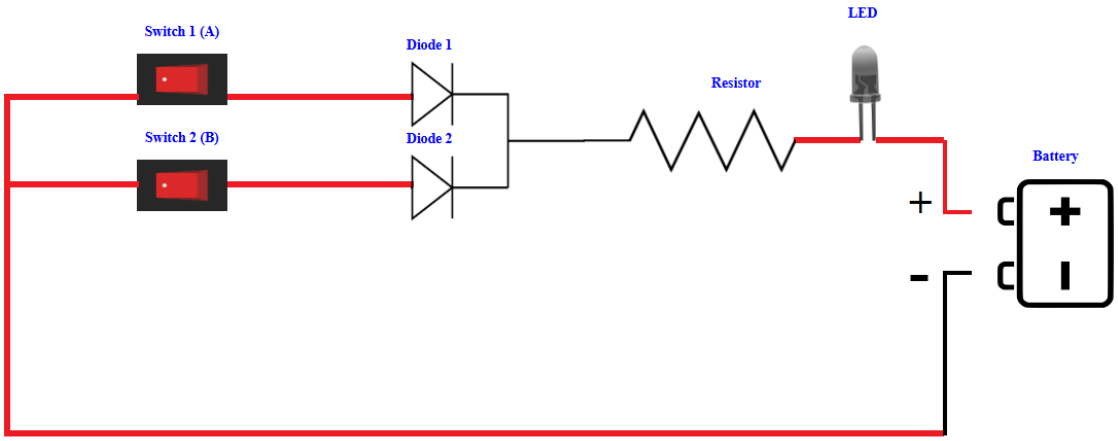

Figure 3

procedure

1) Connect the circuit in Figure (3) using diodes and a resistor (1 KΩ).
2) Attach the lamp or LED to the location in the circuit above.
3) Realize the truth table as in table (1) where if the entrance OFF means that the diode is in a state of reverse bias, and if the input is ON it means that the diode is in forward bias condition, and if the output is ON, then this means that one or both of the diodes are in the state forward bias and the output voltage is equal to +5V.

Discussion

Discuss the case of V_O when the above circuit contains four diodes D1, D2, D3 and D4.