

**TECHNOLOGICAL UNIVERSITY OF PINLON
DEPARTMENT OF ELECTRONIC ENGINEERING**

CONSTRUCTION OF DIGITAL LOGIC GATES BY RELAY

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Aim

Success in Electronics is intended for any one who wishes to gain and understanding of the basic principle of electronics as they are applied in communications, control and computer system.

Appliance

This project is intended to express the basic digital hardware components and their relation with design processes.

Construction

To supply +12V (DC) to logic gates, we use “**Full-wave Bridge Rectifier**”. Full-wave bridge rectifier uses four diodes. When the input cycle is positive, diodes D1 and D2 are forward-biased and conduct current. A voltage is developed across R1 which looks like the positive half of the cycle.

During this time, diodes D3 and D4 are reverse-biased. When the input cycle is negative, diode D3 and D4 are forward-biased and conduct current in the same direction through R1 as during the positive half cycle. During the negative cycle, D1 and D2 are reverse-biased. A full-wave rectified output voltage appears across R1.

Operation

There are three basic types of the digital logic gate.

- (1) use by relays
- (2) use by diode and
- (3) use by transistor.

Choose, using relay

AND Gate circuit

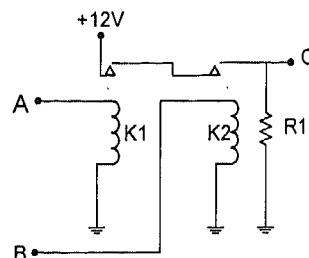


Fig: Relay AND gate

When two relays are connected in series and the plus twelve volts applied to both point A and B will cause relays K1 and K2 to energize, supplying +12V to point C, the output, via the closed K1 and K2 contacts.

AND laws

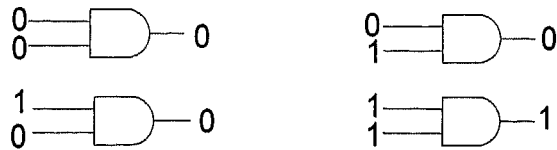


Fig: All possible logic levels for a two input **AND gate**.

OR Gate Circuit

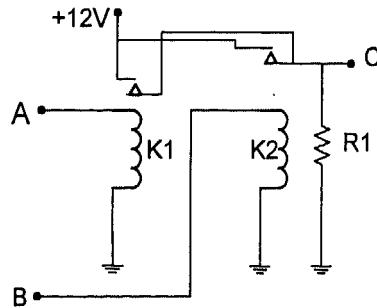


Fig : Relay **OR gate**

Two relays are connected parallel, if either A or B is +12V, one of the relays contacts (which are wired in parallel) will closed , applying +12V to point C, the output.

OR laws

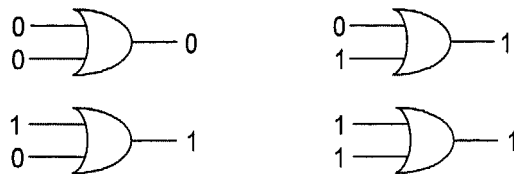


Fig :All possible logic level for a two-input **OR gate** .

NOT Gate (Inverter) Circuit

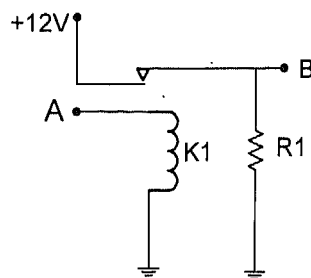


Fig :Relay **NOT gate**