

Literature:

Diode: p 166 – 172, 183-184, 197-210

Assignments:

2.1:

A logic circuit is shown in Fig. 1. The voltage drops of the diodes connected to A and B are 0.7 V and the voltage drop of the LED is 2 V.

- When A is connected to 0 V and B to 0 V, is the LED on or off? Why?
- When A is connected to 0 V and B to 5 V, is the LED on or off? Why?
- When A is connected to 5 V and B to 0 V, is the LED on or off? Why?
- When A is connected to 5 V and B to 5 V, is the LED on or off? Why?
- What logic gate is it?

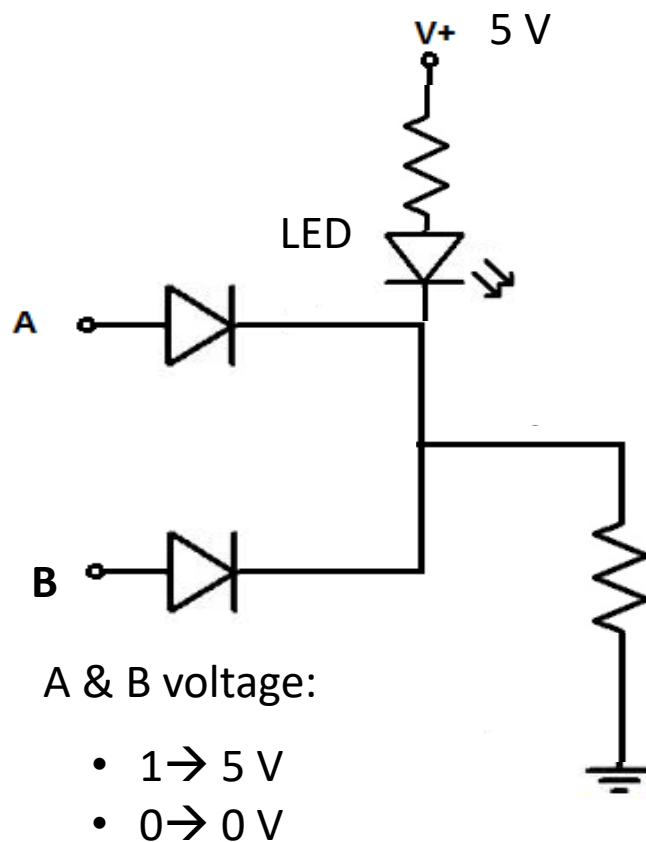


Fig. 1

2.2:

Half-wave rectifier LT spice simulation:

$V_{in} = 4\sin(2\pi 50t)$  , diode 1N4007,  $R = 1\text{ K}\Omega$ , and  $C = 0.0001\text{ F}$

plot the voltage across the resistor for the following cases:

1. Half-wave rectifier with a resistor R.
2. Half-wave rectifier with a capacitor C.
3. Half-wave rectifier with a capacitor C and a resistor R.
4. Half-wave rectifier with a capacitor C and a resistor R.

Change the capacitance of the capacitor to make the output signal smoother.

2.3:

Full-wave rectifier LT spice simulation:

$V_{in} = 4\sin(2\pi 50t)$  , diode 1N4007,  $R = 1\text{ K}\Omega$ , and  $C = 0.001\text{ F}$

plot the voltage across the resistor for the following cases:

1. Full-wave rectifier with a resistor R.
2. Full-wave rectifier with a capacitor C.
3. Full-wave rectifier with a capacitor C and a resistor R.
4. Full-wave rectifier with a capacitor C and a resistor R.

Change the capacitance of the capacitor, i.e., change the value of C, to make the output signal smoother.