

Lecture 2

niceguy

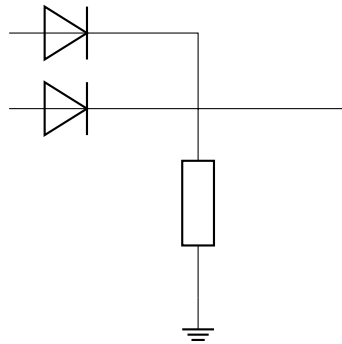
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1 Diodes

To analyse diodes, consider 2 cases:

- $V_{in} > 0$, where the diode is replaced with a short circuit in an equivalent circuit
- $V_{in} < 0$, where the diode is replaced with an open circuit

In AC currents, the above alternates every half-cycle. Remember to verify if the assumption of the current direction is correct!



Example 1.1.

Figure 1: 2 inputs on the left; 1 output on the right

We can build a truth table

If both are on, KCL fails when you consider the current through the bottom resistor. If both are off, net current goes up the bottom resistor without an escape.

Input 1	Input 2	Output
0	0	0
5	0	5
0	5	5
5	5	5

Example 1.2.

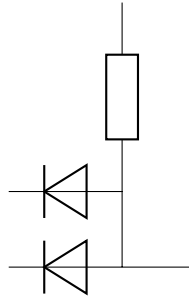


Figure 2: 2 inputs; 1 output; top voltage set at 5

Input 1	Input 2	Output
0	0	0
5	0	5
0	5	5
5	5	5

Example 1.3.

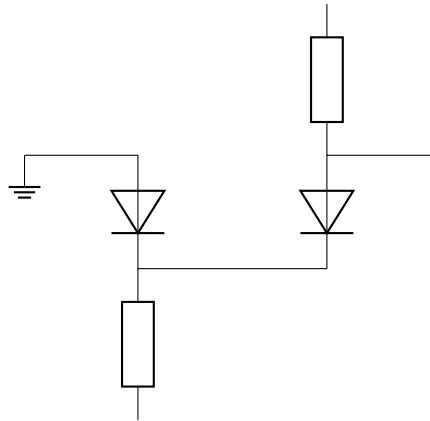


Figure 3: Bottom at -10V; top at 10V, bottom resistor at 10kΩ; top resistor at 5kΩ; 1 output on right