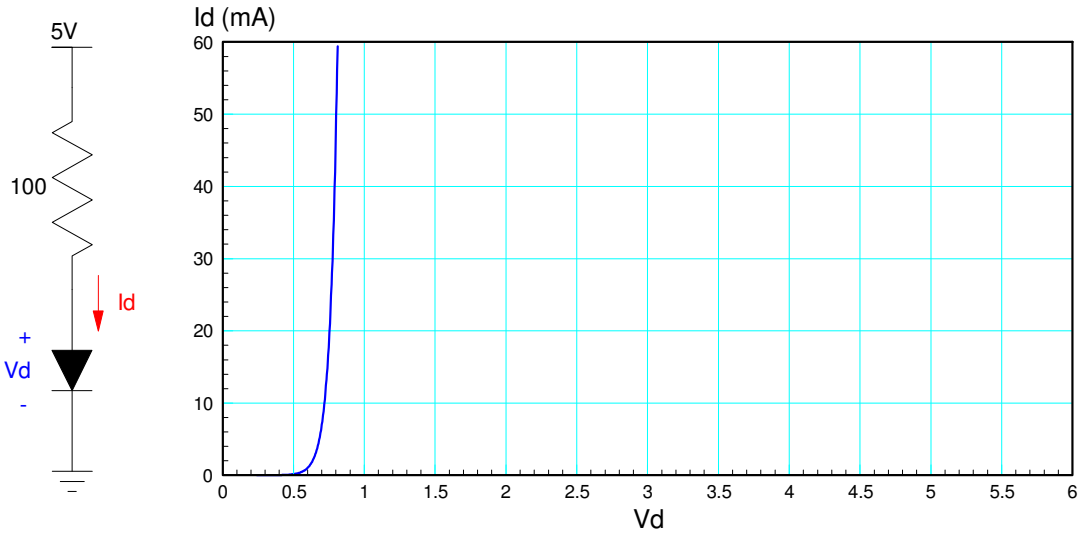
ECE 320 - Homework #3

Ideal Diodes, LEDs, AC to DC Converters. Due February 1st

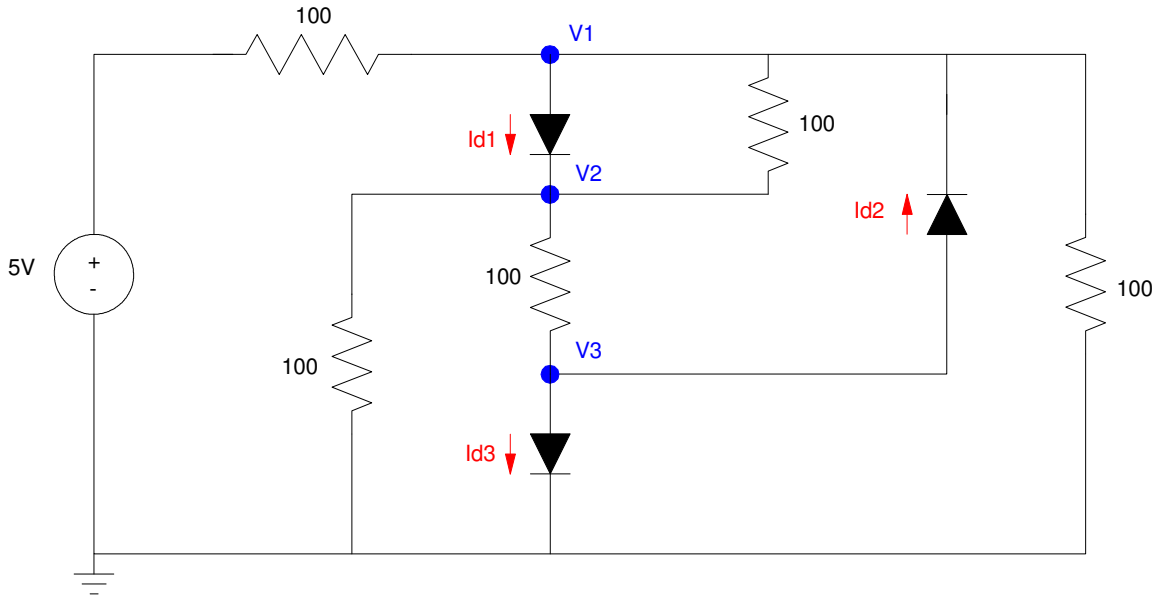
Please make the subject "ECE 320 HW#3" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

Ideal Diodes

1) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltage and the current



2) Assume ideal silicon diodes (Vf = 0.7V). Determine the voltages and currents



LEDs

The specifications for a Piranah RGB LED are

Color	Vf @ 20mA	mcd @ 20mA
red	2.0V	10,000
green	3.2V	10,000
blue	3.2V	10,000

3) Design a circuit to drive these LEDs with a 5V source to produce baby blue:

- Red = 8470 mcd (216/255)
- Green = 9647 mcd (246/255)
- Blue = 9921 mcd (253/255)

4) Design a circuit to drive these LEDs with a 5V source producing burgundy red:

- Red = 6274 mcd (160/255)
- Green = 313 mcd (8/255)
- Blue = 745 mcd (19/255)

Other colors can be obtained from

https://www.rapidtables.com/web/color/color-wheel.html

AC to DC Converters

5) Determine the votlages at V1 and V2 (DC and AC)

6) Build the circuit in CircuitLab (or similar program) and verify your calculations for problem #5

7) Determine C1 and C2 so that AC voltages are: V1 = 2Vpp and V2 = 500mVpp.

8) Build this circuit in CircuitLab (or similar program) and verify your calculations for problem #7