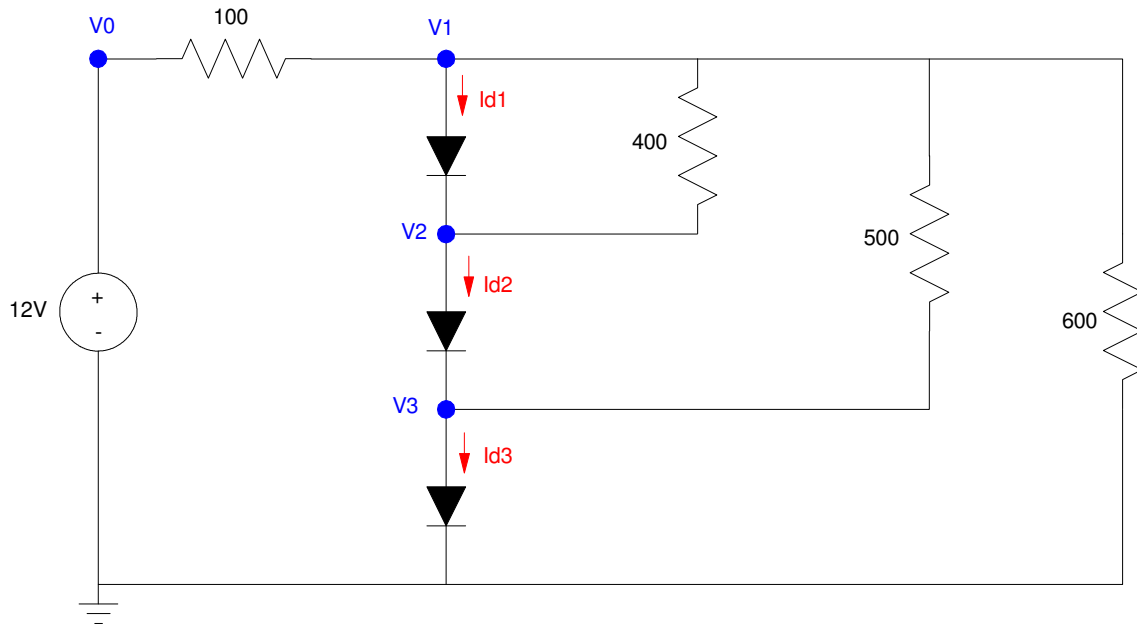


ECE 320: Handout #6

Ideal Diodes

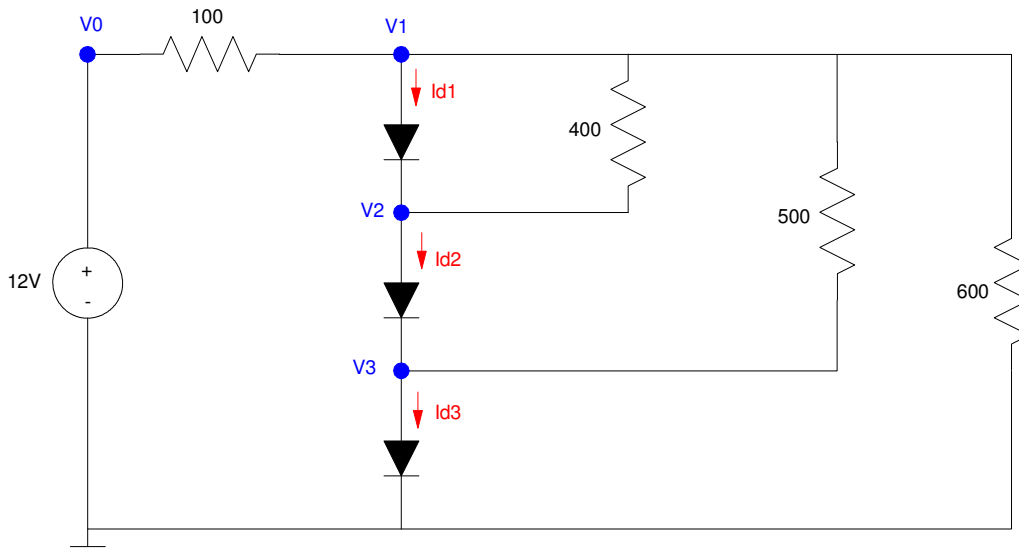
Assume ideal silicon diodes ($V_f = 0.7V$). Determine $\{V_1, V_2, V_3\}$ and $\{I_{d1}, I_{d2}, I_{d3}\}$



ECE 320: Handout

Lecture #6: Ideal Diodes

Assume ideal silicon diodes ($V_f = 0.7V$). Determine $\{V_1, V_2, V_3\}$ and $\{I_{d1}, I_{d2}, I_{d3}\}$



Assume all diodes are on

$$V_3 = 0.7V$$

$$V_2 = 1.4V$$

$$V_1 = 2.1V$$

Currents must then balance

$$\left(\frac{V_1 - 12}{100}\right) + I_{d1} + \left(\frac{V_1 - V_2}{400}\right) + \left(\frac{V_1 - V_3}{500}\right) + \left(\frac{V_1}{600}\right) = 0$$

$$-99.00mA + I_{d1} + 1.75mA + 2.80mA + 3.5mA = 0$$

$$I_{d1} = 90.95mA$$

Diode 2

$$I_{d2} = I_{d1} + \left(\frac{V_1 - V_2}{400}\right)$$

$$I_{d2} = 92.70mA$$

Diode 3

$$I_{d3} = I_{d2} + \left(\frac{V_1 - V_3}{500}\right)$$

$$I_{d3} = 95.50mA$$