COE/EE 152: Basic Electronics

1. A diode has $I_s = 10^{-17}$A, n= 1.07 and V_T = 25mV.

    a) What is the diode voltage if the diode current is 70µA.

    b) What is the diode current when V_D =0V, -0.07V, -5V

2. A diode is biased by a 0.9V dc source and its current is found to be 100µA at T = 315K. At what temperature will the diode current double

3. In the circuit shown in Figure 1.

    a) find I_1, I_2, I_3 which are the current through R_1, R_2, and R_3 respectively and the current I_{D1}, I_{D2} and I_{D3} which are the currents through the diode. Assume all diodes are modeled with constant-voltage drop model and are conducting. Cut-in /Knee voltage is 0.7V

    b) Are all the diodes in 3.a) conducting? If not, solve for the currents in 3.a) again assuming that diode is not conducting and find the reverse bias voltage across that diode

$$k = 8.617 \times 10^{-5} eVK^{-1}$$
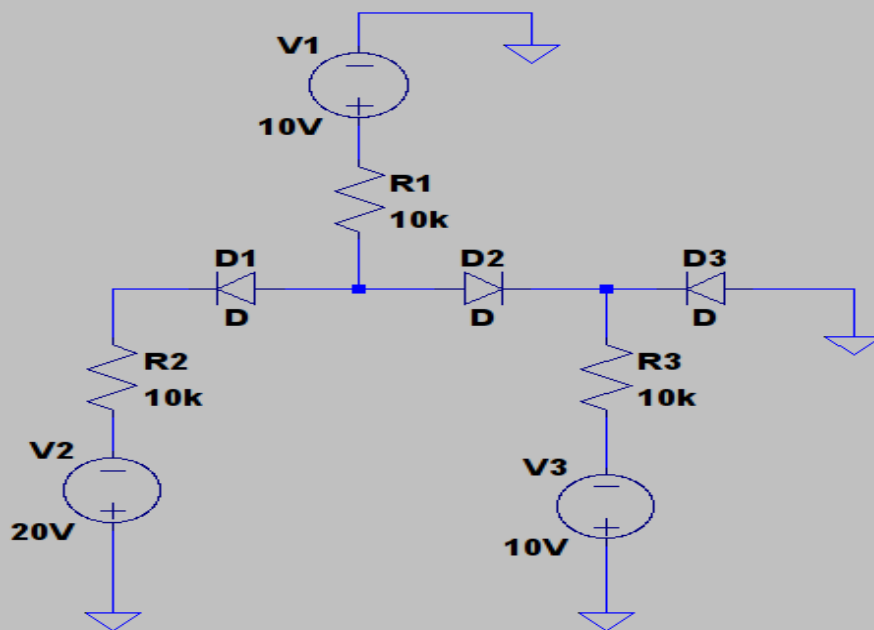$$q = 1.602 \times 10^{-19} C$$
$$n = 1.5$$

Figure 1: