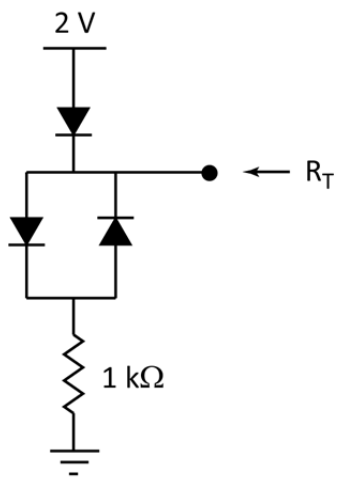ECE 65 Quiz 3

Name_____ PID_____

Question 1 (10 points)

Assuming discrete silicon diodes at 300°K, and the bias conditions shown below, find the *small signal* Thevenin resistance R_T at the indicated terminal.

Question 2 (10 points)

For this transistor, $V_T = 1$ V, $k_n'(W/L) = 1$ mA/V^2 and $\lambda = 0.05$ V^{-1}. Find the *small signal* Thevenin resistance R_T at the indicated terminal. You may neglect λ for the purpose of determining the bias, but you must include it for the small signal resistance.
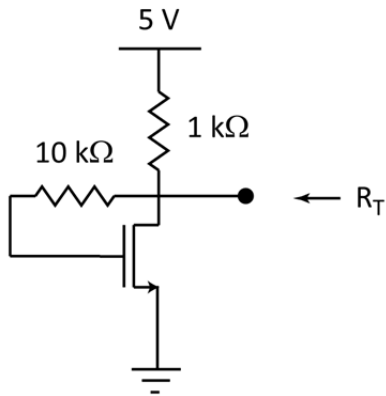
Question 3 (10 points)

Design a bias circuit for a PNP BJT using emitter degeneration with a voltage divider at the base. The supply voltage is 10 V. Design the bias circuit so that V_{EC} is 5 V and I_C=1 mA, and so that the bias is stable for variations in β over a range of 50 to 200, and for variations in V_{EB} of +/-0.1 V. Determine the values of all resistors for your design. Do not worry about choosing standard commercially available resistor values.

10 V