Prelab 8 Homework

Phys 276

Spring 2015

Prof. Anlage

1. In the Ebers-Moll model of transistor operation, write an expression for the collector current I_C in terms of the base-emitter voltage (V_{BE}) in the limit that $V_{BE} >> V_T$, where $V_T = k_B T/e$ is the thermal voltage (k_B is Boltzmann's constant and e is the electronic charge).

2. If you plot $\ln(I_C)$ vs. V_{BE} in the limit $V_{BE} >> V_T$, what is the slope of the line?

3. For the common emitter amplifier shown in Fig. VIII-4, with the values of R1 and R2 shown, what is the gain of the amplifier (V_{OUT} / V_{IN}, where V_{OUT} is measured with the oscilloscope)?