Problem numbers refer to the 6th edition of the textbook.

Problem 6.120.
A CB amplifier is operating with $R_L = 10 \, \text{k}\Omega$, $R_C = 10 \, \text{k}\Omega$, $R_{\text{sig}} = 100 \, \Omega$. At what current $I_C$ should the transistor be biased for the input resistance $R_{\text{in}}$ to be equal to that of the signal source $R_{\text{sig}}$? What is the resulting overall voltage gain? Assume $\alpha = 1$.

Problem 6.121.
For the circuit shown, let $R_{\text{sig}} \gg r_c$ and $\alpha \approx 1$ Find $v_o$.

Problem 6.123.
An emitter follower is required to deliver a 0.5 V peak sinusoid to a 2 kΩ load. If the peak amplitude of $v_{bc}$ is to be limited to 5 mV, what is the lowest value of $I_E$ at which the BJT can be biased? At this bias current, what are the maximum and minimum currents that the BJT will be conducting (at the positive and negative peaks of the output sine wave). If the resistance of the signal source is 200 kΩ, what overall voltage gain is obtained? Thus determine the required amplitude of $v_{\text{sig}}$. The transistor $\beta$ is 100.
Problem 6.147.
The amplifier shown consists of two identical common-emitter amplifiers connected in cascade. Observe that the input resistance of the second stage, $R_{in2}$, constitutes the load resistance of the first stage.

(a) For $V_{CC} = 9$ V, $R_1 = 100 \, \text{k}\Omega$, $R_2 = 47 \, \text{k}\Omega$, $R_E = 3.9 \, \text{k}\Omega$, $R_C = 6.8 \, \text{k}\Omega$, and $\beta = 100$, determine the dc collector current and dc collector voltage for each transistor.

(b) Draw the small-signal equivalent circuit of the entire amplifier (showing the two stages as individual amplifiers) and give the values of all of its components.

(c) Find $R_{in1}$ and $v_{b1}/v_{sig}$ for $R_{sig} = 5 \, \text{k}\Omega$.

(d) Find $R_{in2}$ and $v_{b2}/v_{b1}$.

(e) For $R_L = 2 \, \text{k}\Omega$ and $v_o/v_{b2}$.

(f) Find the overall voltage gain $v_o/v_{sig}$. 

![Amplifier Diagram](image-url)