

Practice Problems Module 7

EE 315

1. A CE amplifier uses an npn BJT with $\beta=100$ and $I_{CQ}=0.5$ mA. The collector resistor, R_C is $12\text{ k}\Omega$ and $R_L=12\text{ k}\Omega$. The amplifier is connected to a signal source with a signal resistance of $10\text{ k}\Omega$. Find the input resistance, R_{in} , output resistance R_o , and the gain, G_v . Assume that $V_A = 50\text{V}$. Draw and clearly label the small signal model.
2. A CB amplifier uses an npn BJT with R_C is $10\text{ k}\Omega$ and $R_L=10\text{ k}\Omega$. The signal resistance is $50\text{ }\Omega$. If α is approximated to 1, what should the collector current q-point be such that the input resistance, R_{in} , is equal to the signal resistance? What is G_v ?
3. A CC amplifier uses an npn BJT biased at a collector q-point of 2mA. The signal resistance, R_{sig} is $10\text{ k}\Omega$ and $R_L= 500\text{ }\Omega$. β is 100. Find R_{in} and G_v .