VE311 Electronic Circuits

Lab 04:

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Laboratory is focused on to understand a few of the things seen in class. Mainly, it is focused on to get the physics behind each device and how can we use them in our favor for future applications. In this practice, we are going to have fun understanding why a transistor is rather important for the nowadays technology by considering a couple of simple configurations...
In advance **ask** to the lab what sort of **npn transistors** for the practice do they have. According to the transistor, **check the data sheet and analyze it as such**.

1. For the follow diagram (Fig. 1), calculate the values for R_C and R_B according to the follow considerations; i_B= 20μA and the i_C= 40×10^{-3} A, hfe can be obtained by the data of the transistor or calculated (preferred). As a matter of fun, simulate the configuration in Spice to get the Q-point.

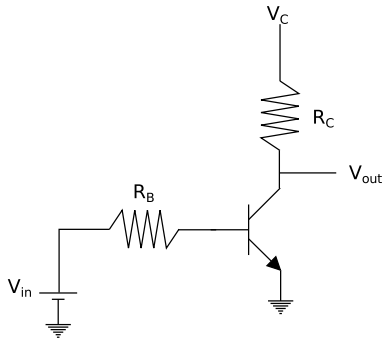

Figure 1: Basic configuration

2. For the second circuit, according to the follow parameters calculate the proper behavior for amplification: C_1= 27 μF, C_2=22 μF, R_1=3 kΩ, R_2=10 kΩ, R_3=1 kΩ, V_{in}= 159 mV, V_C=12 V. On top of that, can you let me know why the reactance for each capacitor is not considered as a key factor in the operation of this amplifier... if we consider that the frequency is 5 kHz.

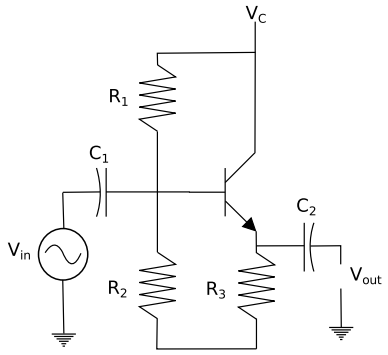

Figure 2: Basic configuration

For each one of the experiments you need to obtain images from the oscilloscope, in which you show the key variations of the experiment. Support your images with appropriate explanation as well as numerical analysis and simulations by using SPICE. Each group must submit a report. Be aware of your safety and your team mates.