ÇANKAYA ÜNİVERSİTESİ
ELEKTRİK - ELEKTRONİK MÜHENDİSLİĞİ BÖLÜMÜ

LAB-1

Name Surname	**Number**
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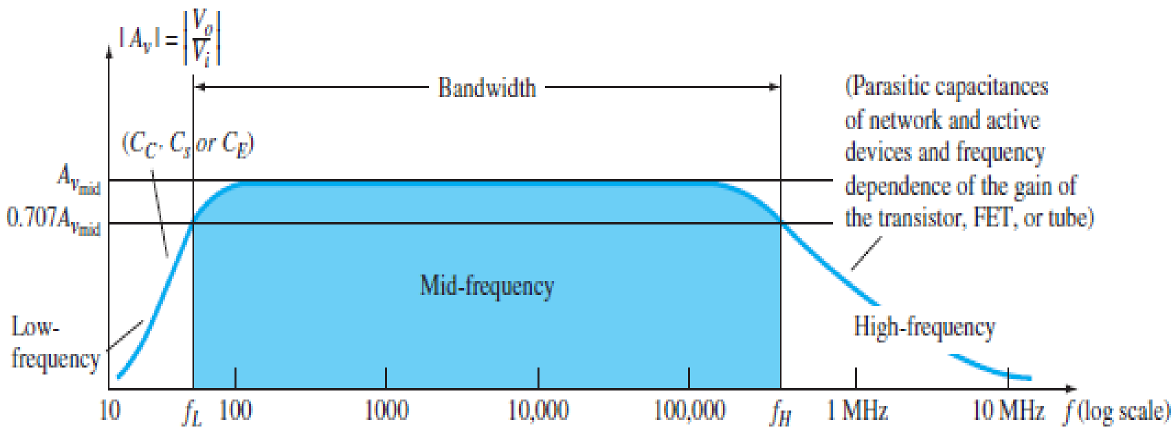
Objective: Obtain the common emitter amplifier frequency response, draw the bode plots.

Important Note: Check that your cables are working properly before starting each experiment.

Theory:

Note that the horizontal scale is a logarithmic scale to permit a plot extending from the low- to the high-frequency regions. For each plot, a low-, a high-, and a mid-frequency region has been defined. In addition, the primary reasons for the drop in gain at low and high frequencies have also been indicated within the parentheses.



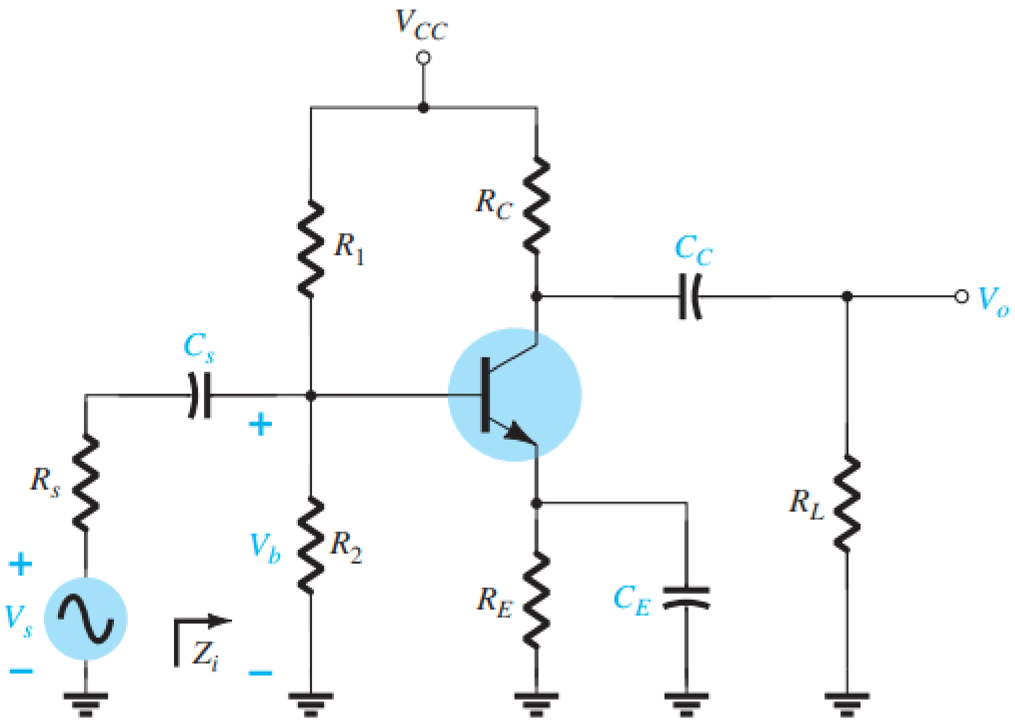
There is a band of frequencies in which the magnitude of the gain is either equal or relatively close to the midband value. To fix the frequency boundaries of relatively high gain, **$0.707A_{Vmid}$ which corresponds -3 dB below the midband gain** was chosen to be the gain at the cutoff levels. The corresponding frequencies f_1 and f 2 are generally called the corner, cutoff, band, break, or half-power frequencies. The multiplier 0.707 was chosen because at this level the output power is half the midband power output.

The bandwidth (or passband) of each system is determined by f_H and f_L, that is,

$$\text{bandwidth (BW)} = f_H - f_L$$

Lab work:

1. Implement the following common emmiter amplifier. Then, measure the gain (Vout/Vin) for the frequencies in the table. (C_S = 10 uF, C_E = 22uF, C_C = 1uF, R_1 = 39kΩ, R_2 = 10kΩ, R_E = 2.2kΩ, R_C = 3.9kΩ, R_L = 220kΩ, R_S = 1kΩ β = 100, V_{CC} = 20V) (pp = peak to peak voltage, A_V = Voltage gain) (you can use 20*log(A_V) for gain in dB)



Frequency (Hz)	Gain $A_V(Vout_{pp}/Vin_{pp})$	Gain (dB) 20*log(A_V)
5		
10		
20		
50		
100		
150		
1k		
10k		
20k		
30k		
40k		
50k		
100k		
150k		
200k		
1M		