Electronics II, Exam-1, Spring 2019

Department of Communication Engineering, National Central University

March 29, 2019, Prof. Dah-Chung Chang (E1-311)

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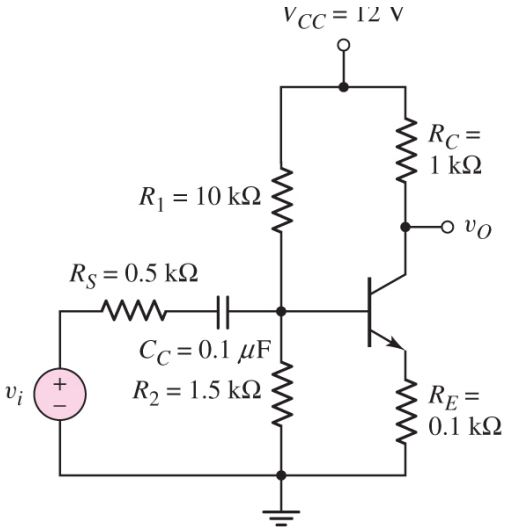
1. (total 35 points: 20 points, 15 points)

The transistor parameters are $\beta = 100, V_{BE(\text{on})} = 0.7V, V_A = \infty$.

(a) Determine the lower corner 3dB frequency. (20%)

(b) Determine the midband small-signal voltage gain. (15%)



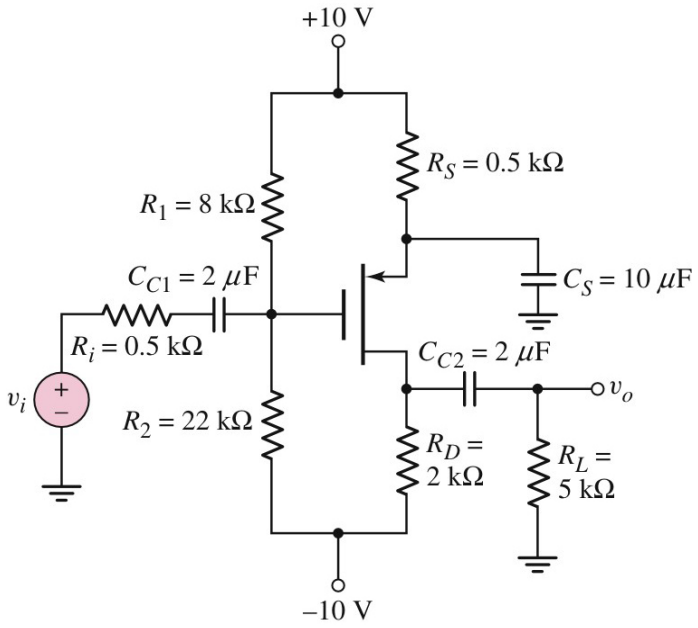
2. (total 35 points: 20 points, 15 points)

The transistor parameters are $V_{TP} = -2V, K_p = 1mA/V^2, \lambda = 0, C_{gs} = 15pF,$ and $C_{gd} = 3pF$.

(a) Determine the upper 3dB frequency. (20%)

(b) Find the midband voltage gain. (15%)

(Assume that the signal frequency is sufficiently high such that the outside capacitors connected to the transistor can be treated as short circuits).



3. (total 30 points: 15 points, 15 points)

The transistor parameters are $\beta = 100$, $V_{EB}(on) = 0.7V$, and $V_A = \infty$. Assume that a load capacitance $C_L = 15pF$ is connected in parallel with R_L. Determine

(a) upper 3 dB frequency

(b) small-signal midband voltage gain.