Note: The scientific calculator is allowed in all Electronics II exams.
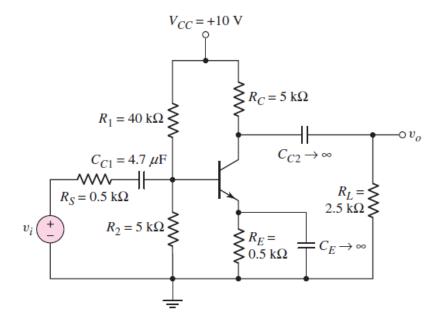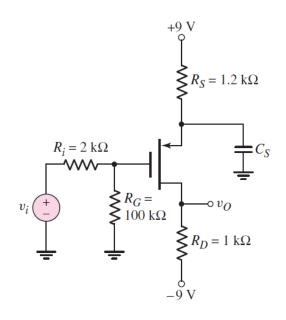
1. (40%) The transistor parameters are $\beta = 120, V_{BE}(on) = 0.7\text{V}, V_A = \infty, C_\mu = 3\text{pF}$, and $f_T = 250\text{MHz}$.

    (a) Determine the lower 3dB frequency. (15%)
    (b) Determine the upper 3dB frequency. (15%)
    (c) Find the midband voltage gain. (10%)

2. (25%) The transistor parameters are $V_{TP} = -2\text{V}, K_p = 2mA/V^2, \lambda = 0.01V^{-1}, C_{gs} = 10pF$, and $C_{gd} = 1pF$.

    (a) Determine the upper 3dB frequency. (15%)
    (b) Find the midband voltage gain. (10%)

3. (35%) The transistor parameters are $\beta = 100, V_{BE}(on) = 0.7V, V_A = \infty, C_\pi = 24\,pF$, and $C_\mu = 3\,pF$.

(a) Determine the upper 3dB frequencies corresponding to the input and output portions of the equivalent circuit. (20%)

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