Hwk 9 - EECE 352

Winter 2009

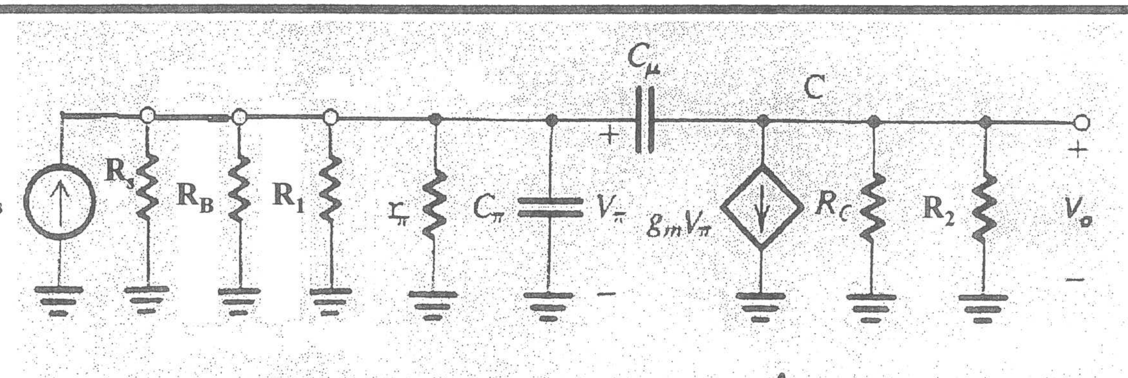
due Feb. 23 in class

Use the Gray-Searles procedure to show that for C_μ, the frequency of the high-frequency pole is given by

$$\omega_{C_\mu} = \frac{1}{R_{xC_\mu} C_\mu}$$

where R_{xC_μ} is given below.

Original High Frequency Poles (Gray-Searles procedure)



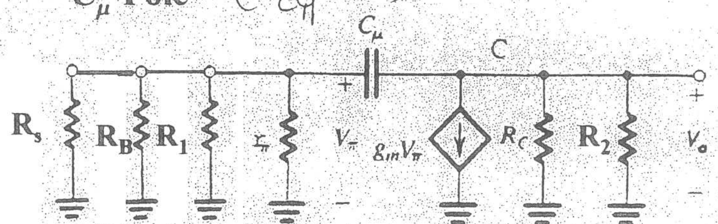
C_π Pole ($Z_{C_\mu} = \infty$)

$$R_{xC\pi} = \left(R_s \| R_B \| R_1 \| r_\pi\right) = 10K \| 9K \| 8K \| 0.8K = 0.68K$$

$$\omega_{C\pi} = \frac{1}{R_{xC\pi} C_\pi} = \frac{1}{0.68K(7pF)} = 2.1x10^8 \, rad/s$$

See analysis for $C_{\mu 2}$ high frequency pole for Series-Shunt feedback amplifier example. →

C_μ Pole ($Z_{C_\pi} = \infty$)



$$R_{xC\mu} = \left(R_C \| R_2\right) + \left[1 + g_m \left(R_C \| R_2\right)\right]\left[R_s \| R_B \| R_1 \| r_\pi\right]$$

$$= \left(1.5K \| 8K\right) + \left[1 + 98mA/V\left(1.5K \| 8K\right)\right]\left[10K \| 9K \| 8K \| 0.8K\right] = 86K$$

$$\omega_{C\mu} = \frac{1}{R_{xC\mu} C_\mu} = \frac{1}{86K(0.5pF)} = 2.3x10^7 \, rad/s$$