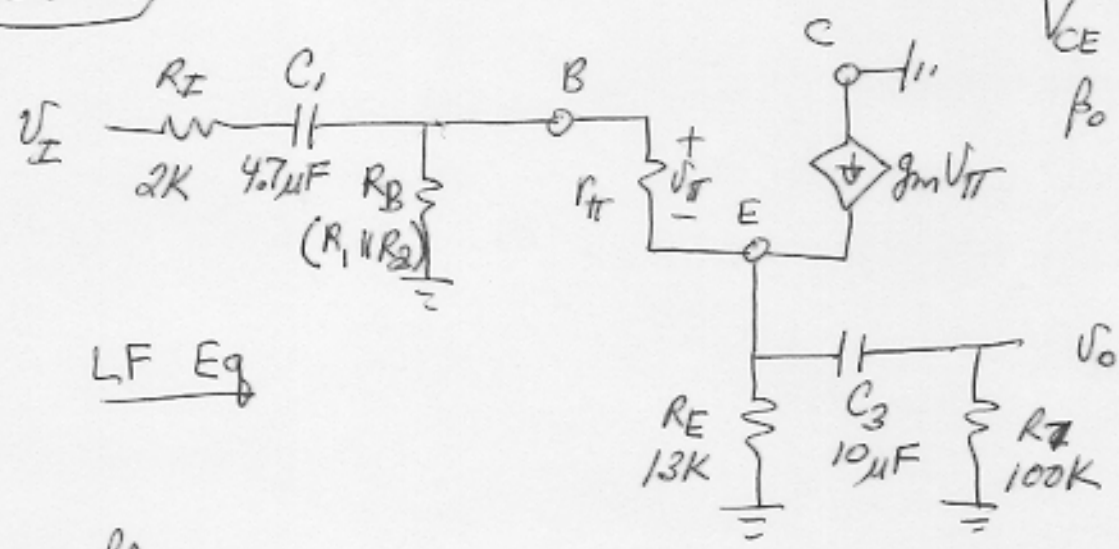
Jaeger 3rd ed

16.22

$I_C = 0.25\,mA$

$V_{CE} = 12\,V$

$\beta_o = 100$

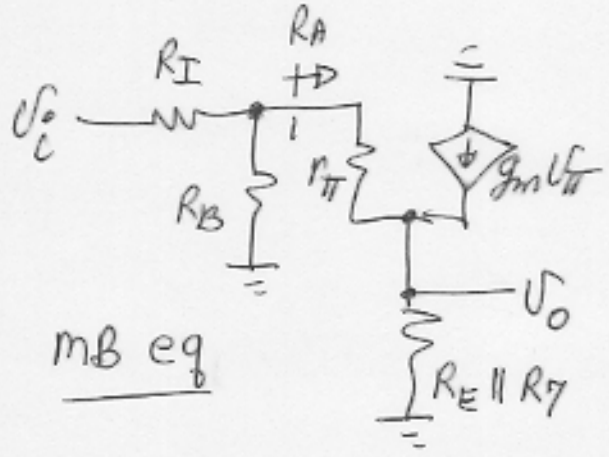


$R_1 = 100K$

$R_2 = 300K$

LF Eq

(a)



mB eq

$$g_m = \frac{I_C}{V_T} = 10\,mS$$

$$r_\pi = \frac{\beta_o}{g_m} = 10K\,\Omega$$

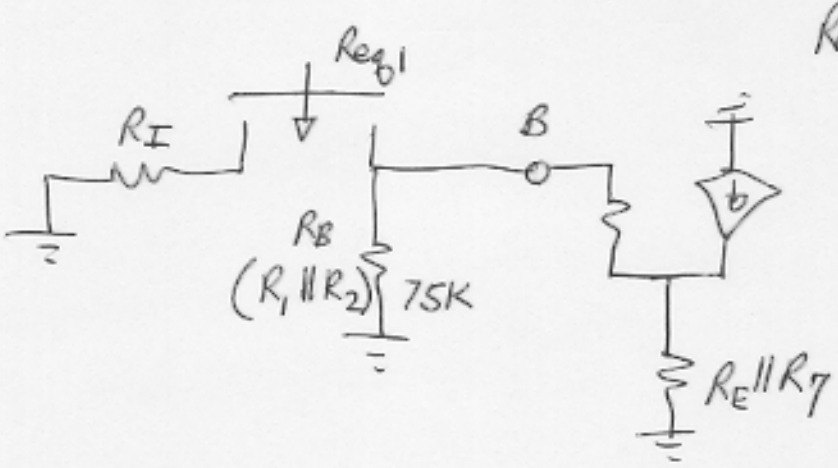
$$r_e = 99.0\,\Omega$$

(b) $$A_m = \left.\frac{V_o}{V_i}\right|_{midband} = \frac{R_B \| \left[r_\pi + (1+\beta_o)(R_E \| R_7)\right]}{R_I + R_B \| \left[r_\pi + (1+\beta_o)(R_E \| R_7)\right]} \frac{(R_E \| R_7)}{(R_E \| R_7) + r_e}$$

$$= +0.96$$

16.22 cont

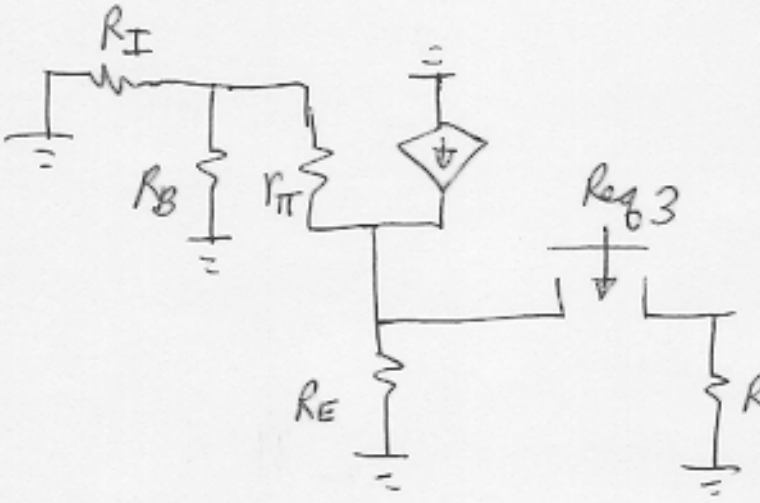
Use Method S.C. time constants



$$R_{eq1} = R_I + R_B \| [r_\pi + (1+\beta_0)(R_E \| R_7$$

$$= 72.49\ K\Omega$$

$$\left(\frac{1}{R_{eq1} C_1}\right) = 2.94\ /sec$$



$$R_{eq3} = R_7 + R_E \| \left[\frac{(R_I \| R_B) + r_\pi}{1+\beta_0}\right]$$

$$= 100.1\ K\Omega$$

$$\left(\frac{1}{R_{eq3} C_3}\right) = 1.00\ /sec$$

$\omega_L \cong 3.94\ rad/s$

$f_L = 0.63\ Hz$