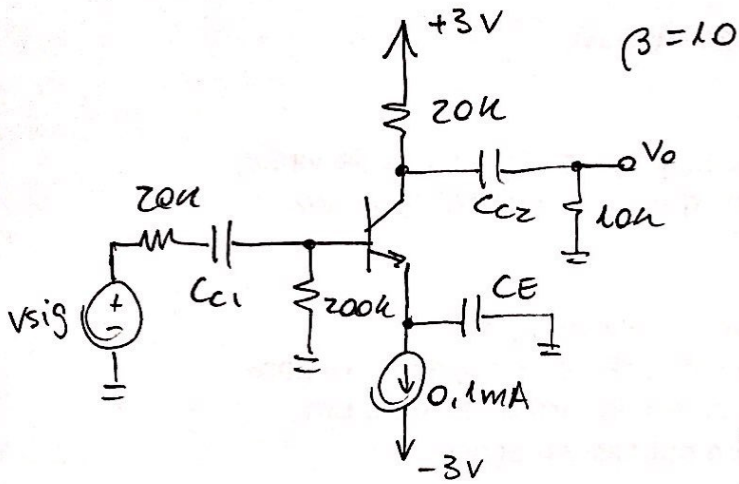


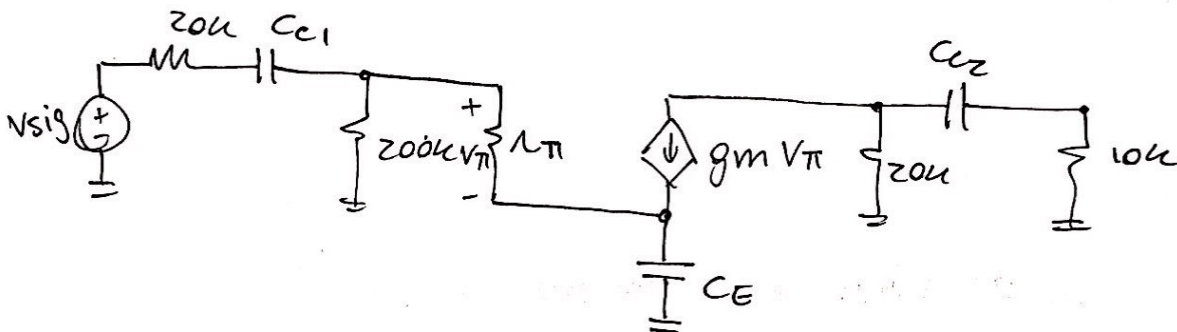
Resolução Ex. 7 - CEA



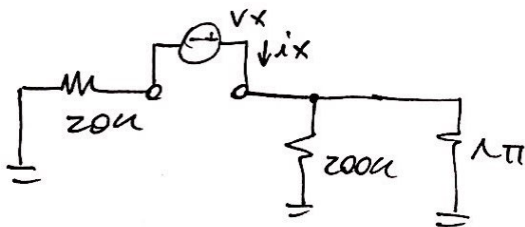
projetar  $C_{c1}$ ,  $C_{c2}$  e  $C_E$   
 p/  $\omega_L \approx 2\pi \cdot 100 \text{ Hz}$

$\rightarrow I_E = 0,1 \text{ mA}$   
 $I_C = 0,099 \text{ mA}$   
 $r_{\pi} = 25,25 \text{ k}\Omega$   
 $g_m = 3,96 \text{ mA/V}$

$\rightarrow$  Análise de pequenos sinais

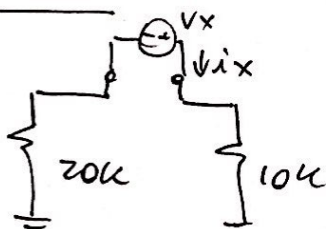


$\rightarrow$  P/  $C_{c1}$



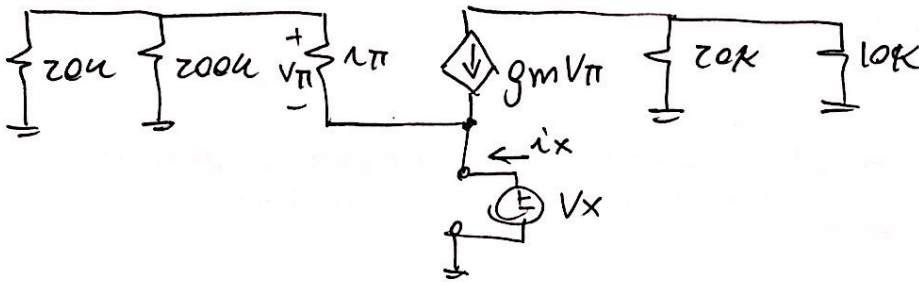
$R_{cc1} = 20\text{k} + 200\text{k} // r_{\pi} = 42,42 \text{ k}\Omega$

$\rightarrow$  P/  $C_{c2}$



$R_{cc2} = 20\text{k} + 10\text{k} = 30\text{k}\Omega$

→ P/CE



$$v_{\pi} = -v_x \cdot \frac{10k}{10k + 200k // 200k} = -0,58 v_x$$

$$i_x = -g_m v_{\pi} = \frac{v_{\pi}}{10k} = -\left(g_m + \frac{1}{10k}\right) (-0,58) v_x$$

$$i_x = 2,32 \text{ mA/V} \cdot v_x$$

$$R_{CE} = \frac{v_x}{i_x} = 431 \Omega$$

→ ① Uma possibilidade:

$$\omega_L = \underbrace{\frac{1}{R_{ce1} \cdot C_{c1}}}_{10\%} + \underbrace{\frac{1}{R_{ce2} \cdot C_{c2}}}_{10\%} + \underbrace{\frac{1}{R_{CE} C_E}}_{80\%}$$

$$\begin{aligned} C_{c1} &= 375,2 \text{ nF} \\ C_{c2} &= 530,5 \text{ nF} \\ C_E &= 4,6 \mu\text{F} \end{aligned}$$

② Outro exemplo

$$\frac{1}{R_{CE} C_E} \rightarrow \text{dominante}$$

$$\frac{1}{R_{CE} C_E} \approx \omega_L \rightarrow \begin{cases} C_E = 3,7 \mu\text{F} \\ C_{c1} = 375,2 \text{ nF} \\ C_{c2} = 530,5 \text{ nF} \end{cases}$$

$$\frac{1}{R_{ce1} C_{c1}} \approx \frac{1}{R_{ce2} C_{c2}} \approx \frac{\omega_L}{10} \rightarrow \begin{cases} C_{c1} = 375,2 \text{ nF} \\ C_{c2} = 530,5 \text{ nF} \end{cases}$$