

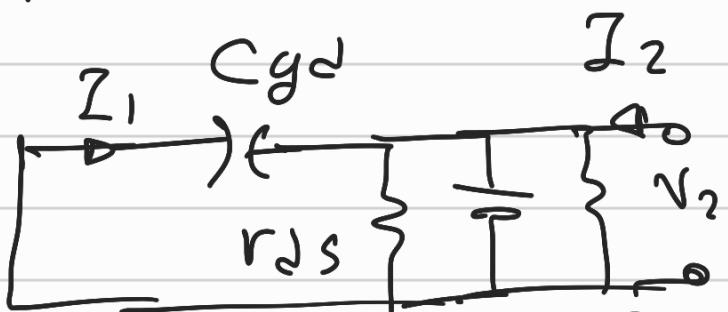
$$y_i := \frac{I_1}{V_1} \Big|_{V_2=0}$$

$$y_i = \frac{1}{R_1} + j\omega(C_{gs} + C_{gd}) = 1 + j0.6002 \text{ mS}$$

$$y_f = \frac{I_2}{V_1} \Big|_{V_2=0} = g_m - j\omega C_{gs} = 30 - j0.5001 \text{ mS}$$

KCL: $I' + I_2 = g_m V_1$

$$j\omega C_{gs} V_1 + I_2 = g_m V_1$$



$$y_r = \frac{I_1}{V_2} \Big|_{V_1=0} = -j\omega C_{gd}$$

$$= -j0.10003 \text{ mS}$$

$$y_0 = \left. \frac{I_2}{V_2} \right|_{V_1=0} = \frac{1}{R_2 + \frac{1}{r_{ds}}} + j\omega(C_{ds} + C_{gs})$$

$$= 2.2 + j0.3001 \text{ mS}$$

$$C = \frac{|Y_r Y_f|}{2g_i g_o - R_e(Y_r Y_f)} = 0.5176$$

میں اسی درجہ کا مطلب
کہ G_A , G_T اور r_{ds} کے مابین روابط میں
کوئی تغیرت نہیں۔

$$G_{Lo} = \frac{1}{2g_i} \sqrt{(2g_i g_o - R_e(Y_r Y_f))^2 - |Y_r Y_f|^2}$$

$$B_{Lo} = -b_o + \frac{\operatorname{Im}(Y_r Y_f)}{2g_i}$$

$$G_{So} = \frac{1}{2g_o} \sqrt{(2g_i g_o - R_e(Y_r Y_f))^2 - |Y_r Y_f|^2}$$

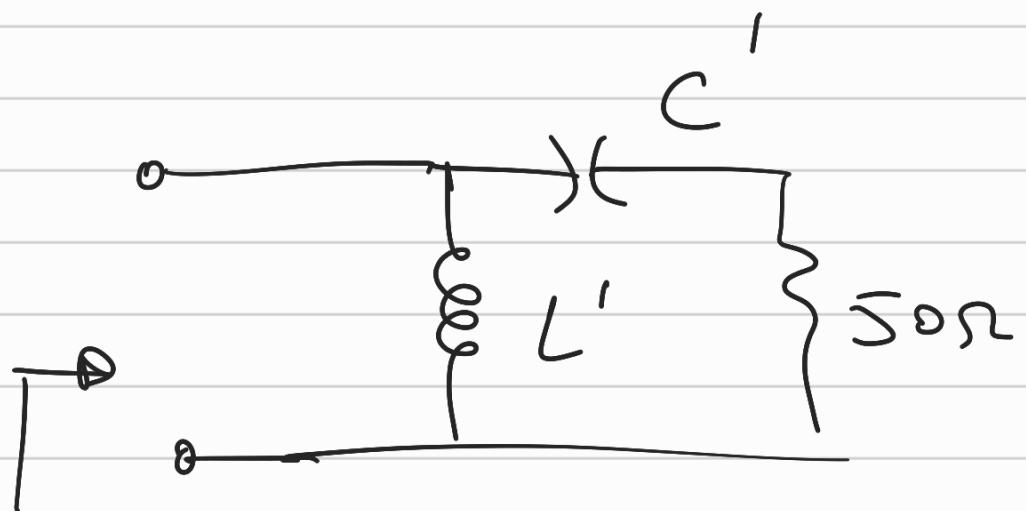
$$B_{So} = -b_i + \frac{\operatorname{Im}(Y_r Y_f)}{2g_o}$$

$$G_L = 1.2403 \text{ m}^{-2}$$

$$B_L = -0.3001 \text{ m}^{-2}$$

$$G_{S_0} = 0.5638 \text{ m}^{-2}$$

$$B_{S_0} = -0.6002 \text{ m}^{-2}$$



$$1.2403 - j0.3001 \text{ m}^{-2}$$

مُرَجِّعٌ مُرَجِّعٌ

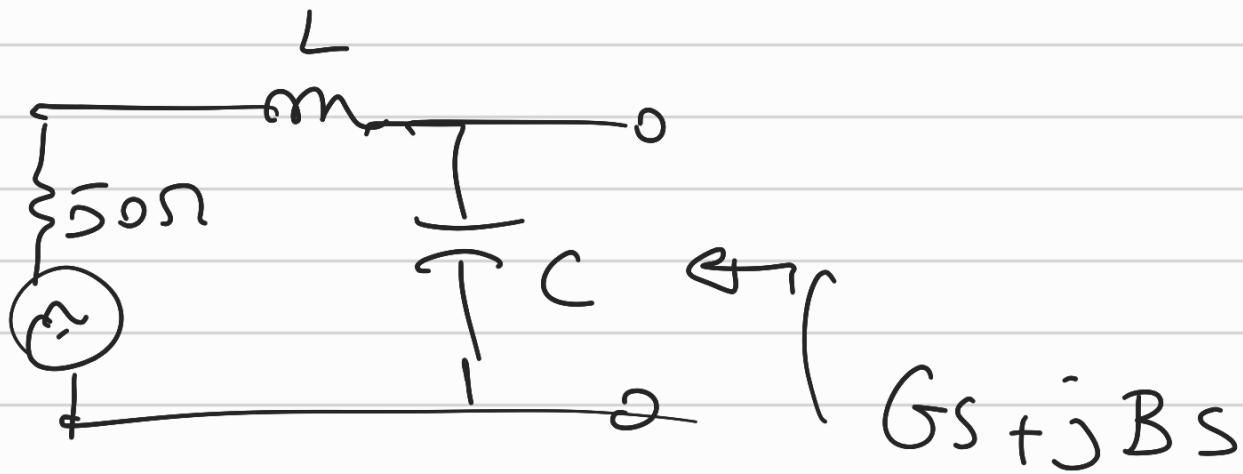
$$G_L = 1.2403 \times 10^{-3} = \frac{R_L (C' \omega)^2}{1 + (R_L C' \omega)^2}$$

$$R_L = 50 \Omega$$

$$\rightarrow C' = 0.264 \text{ PF}$$

$$BL = -0.3001 \times 10^{-3} = \frac{1}{L'\omega} - \frac{C'\omega}{(R(C\omega))^2}$$

$$L' = 0.6609 \text{ nH}$$



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$$Gs = \frac{RL}{R_L^2 + L^2\omega^2} = 0.5638 \times 10^{-3}$$



$$L = 2.934 \mu\text{H}$$

-3

$$Bs = C\omega = \frac{L\omega}{R_L^2 + (L\omega)^2} = -0.6002 \times 10^{-3}$$

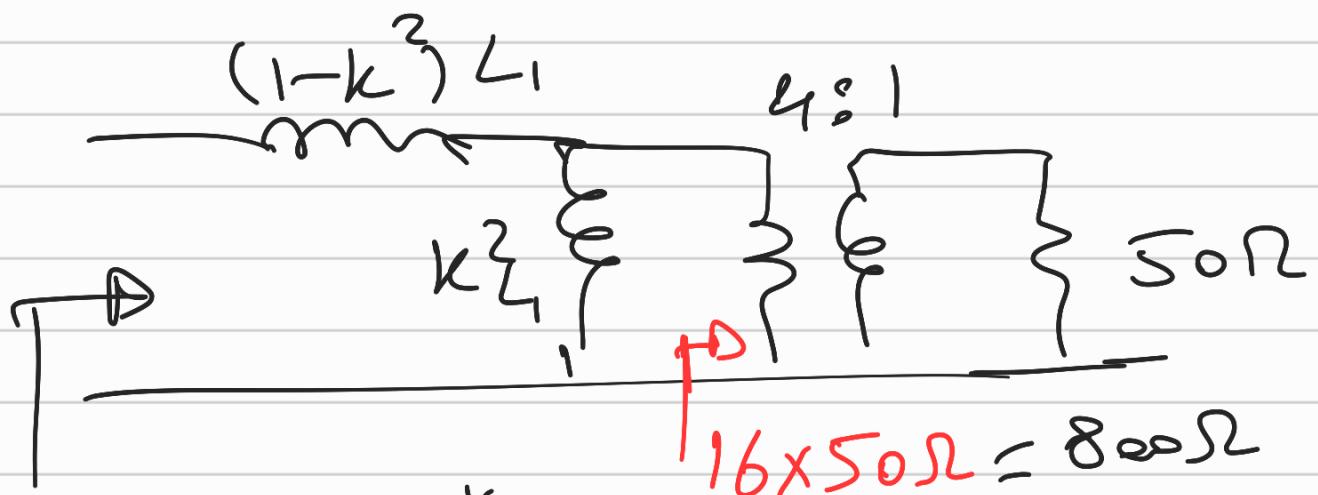


$$C = 270.9 \text{ pF}$$

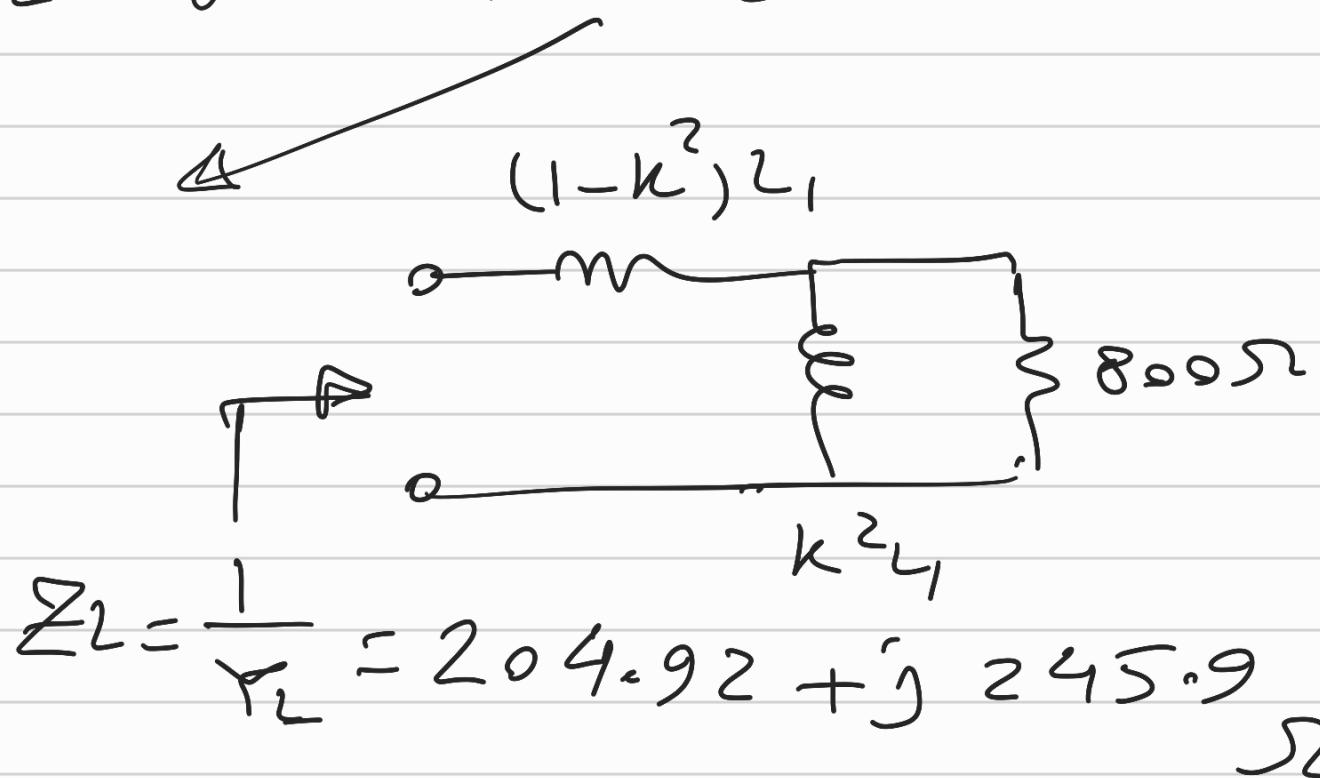
\leftarrow Cascode چون $(r_1 = 1)$

$$Y_{\text{out}} = Y_0 - \frac{Y_r Y_f}{Y_i + Y_s} \approx Y_0$$

$$= 2 + j2.4 \text{ m}\Omega$$



$$Y_L = Y_{\text{out}}^* = 2 - j2.4 \text{ m}\Omega$$



$$Z_L = \frac{1}{Y_L} = 204.92 + j 245.9 \Omega$$

٣١٥ مراجعة الفصل

$$Z_{in} = \frac{G_L (L_1 \omega)^2}{1 + G_L^2 (L_1 \omega)^2} + j \left(L_2 \omega + \frac{L_1 \omega}{1 + G_L L_1 \omega} \right)$$

$$Z_{in} = \frac{G_L (k^2 L_1 \omega)^2}{1 + G_L^2 (k^2 L_1 \omega)^2} + j \left((1 - k^2) L_1 \omega + \frac{k^2 L_1 \omega}{1 + G_L^2 (k^2 L_1 \omega)^2} \right)$$

كتن حفظ

$$204.92 = \frac{(1/204.92) * (k^2 L_1 \times \omega)^2}{1 + \left(\frac{1}{204.92}\right)^2 (k^2 L_1 \omega)^2}$$

$k^2 L_1 = 1.4486 \times 10^{-7}$

كتن سرطان

$$245.9 = (1 - k^2) L_1 \omega + \frac{k^2 L_1 \omega}{1 + G_L^2 (k^2 L_1)^2 \omega^2}$$
$$= L_1 \omega - k^2 L_1 \omega + //$$

$$L_1 \omega = 294 \cdot 2006$$

$$L_1 = 0.2941 \text{ H}$$

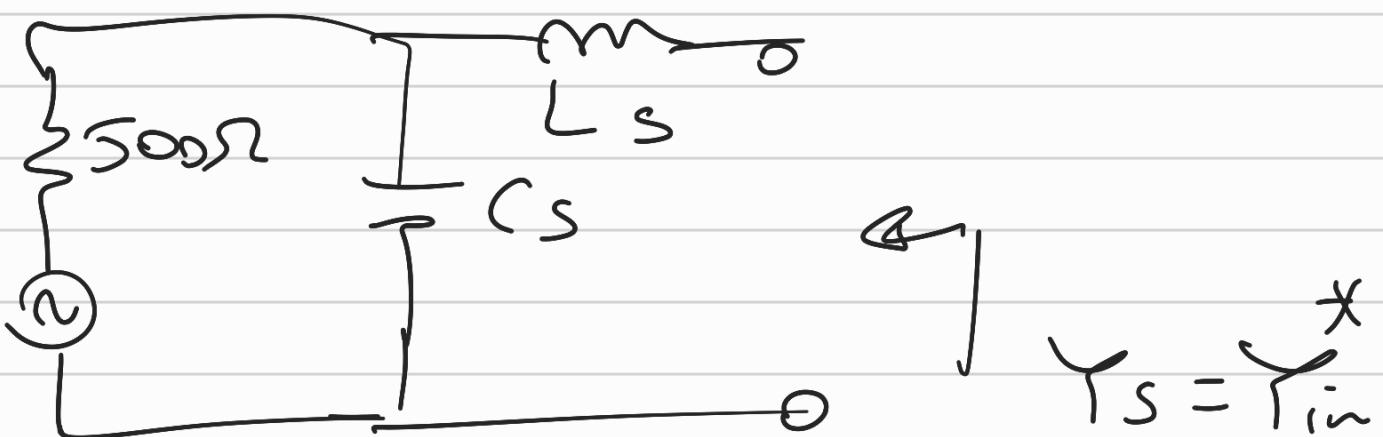


$$k = 0.7018$$

$$n = k \sqrt{\frac{L_1}{L_2}}$$

$$4 = 0.7018 \sqrt{\frac{L_1}{L_2}} \rightarrow \boxed{L_2 = 9.1 \text{ nH}}$$

: طراحی تطبیق رله



$$Y_{in} = Y_i - \frac{Y_0 + Y_L}{Y_0 Y_L} \approx Y_i$$

$$Y_{in} = 10 + j15 \text{ m}^{-2}$$

$$Y_S = 10 - j15 \text{ m}^{-2}$$

$$\frac{1}{S_{00}} \rightarrow$$

: ١١٥ معامل

$$Z_{in} = \frac{G_L}{G_L^2 + C^2 \omega^2} - j \left(\frac{C\omega}{G_L^2 + (C\omega)^2} - L\omega \right)$$

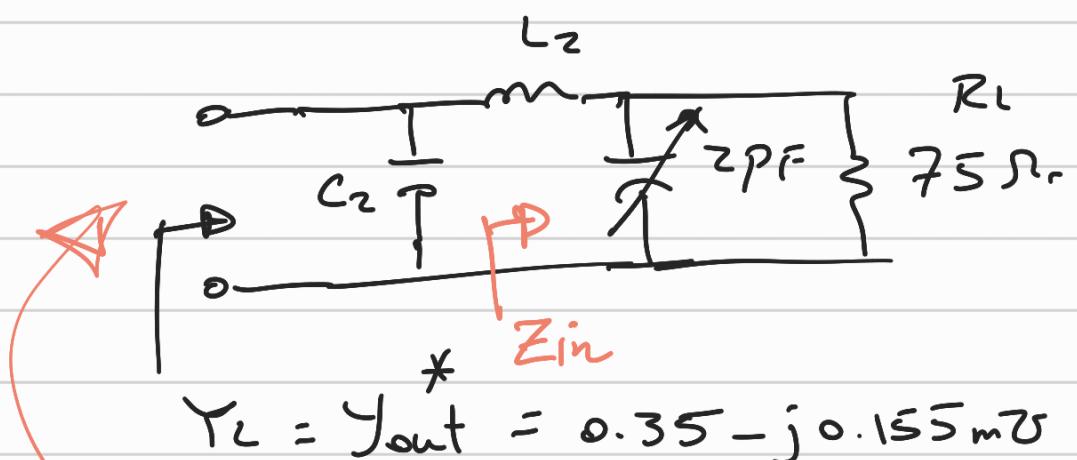
$$Z_{in} = \frac{1}{Y_S} = 30.7692 + j46.1538$$

L, C معامل

(٢-١) حون تقویت ساده است مدل آمده
است امپاگر و دری دفردی سلسله زاسپلنز کن با رو ضعیف باشد

$$Y_{in} \approx Y_i = 2.56 + j12 \text{ m}\Omega$$

$$Y_{out} \approx Y_o = 0.35 + j0.155 \text{ m}\Omega$$



مدار تطبیق ۱، ۲ و لامپ خازن تغیر IPF

$$Z_{in} = \frac{G_L}{G_L^2 + C^2 \omega^2} - j \left(\frac{C\omega}{G_L^2 + C^2 \omega^2} - L\omega \right)$$

\uparrow IPF \uparrow IPF

$$Z_L = \frac{1}{Y_L} = 2.3887 + j1.0578 \text{ k}\Omega$$

$$Z_L = Z_{in} \parallel \frac{1}{j\omega C_2}$$

$$Z_{in} = 0.0419 - j5.0661 + j\omega L_2 \quad \Omega$$

$$Z_L = \frac{(0.0419 + j(\omega L_2 - 5.0661)) \times \frac{1}{j\omega C_2}}{\left[0.0419 + j(\omega L_2 - 5.0661)\right] + \frac{1}{j\omega C_2}}$$

$$Z_L = \frac{\frac{\omega L_2 - 5.0661}{\omega C_2} - j \frac{0.0419}{\omega C_2}}{0.0419 + j(\omega L_2 - 5.0661 - \frac{1}{\omega C_2})}$$

$$Z_L = \frac{\frac{\omega L_2 - 5.0661}{\omega C_2} \times 0.0419 + \frac{0.0419}{\omega C_2} (\omega L_2 - 5.0661 - \frac{1}{\omega C_2})}{(0.0419)^2 + (\omega L_2 - 5.0661 - \frac{1}{\omega C_2})^2}$$

2.3887 kΩ

$$+ j \frac{\left(-\frac{0.0419}{\omega C_2}\right)^2 + (\omega L_2 - 5.0661 - \frac{1}{\omega C_2})(\frac{\omega L_2 - 5.0661}{\omega C_2})}{1.0578 kΩ}$$

"

L_2, C_2 سے اس کا

لگانے کی طرح اسکے مکمل مجموعہ

$$Y_{L_{opt}} = 1.2 - j0.6 \text{ mΩ} \quad (\Delta-1)$$

$$Y_{S_{opt}} = 25 - j8.1 \text{ mΩ}$$

لُقْبَقِ رَحْرَجِي



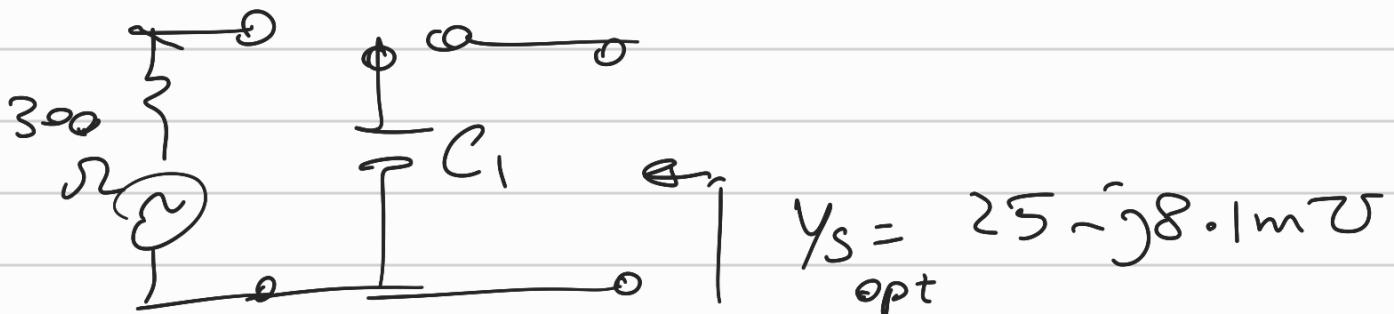
لِذَا الصِّرْقِ سُعَادٍ، سِعَادٌ، سِعَادٌ



$$1.2m\omega = \frac{R_L}{R_L^2 + (L\omega)^2} = \frac{300}{9 \times 10^9 + (L\omega)^2}$$

$$\omega = 400 \Rightarrow L = 0.90946 \text{ mH}$$

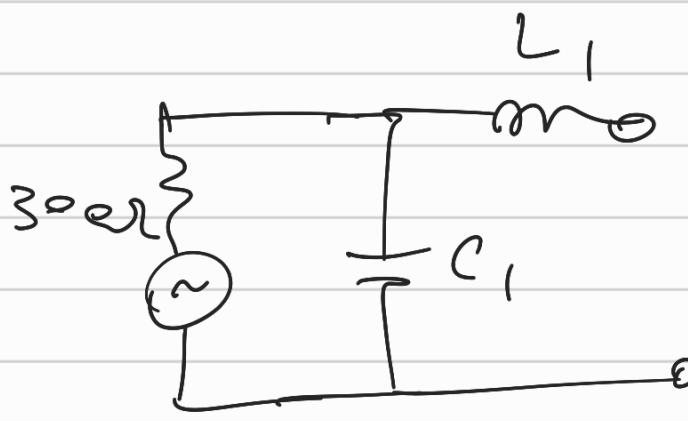
لُقْبَقِ رَسْدَرِي



$$R_s < \frac{1}{G_L}$$

جوج

$$\frac{1}{2\omega_m r} < 300$$



ـ تـعـقـيـدـ عـنـ قـصـيـرـ

$$Y_s = \frac{1}{Z_s} = \frac{1}{25 - j8.1m\Omega}$$

↓

$$Z_s = 36.2 + j11.7 \Omega$$

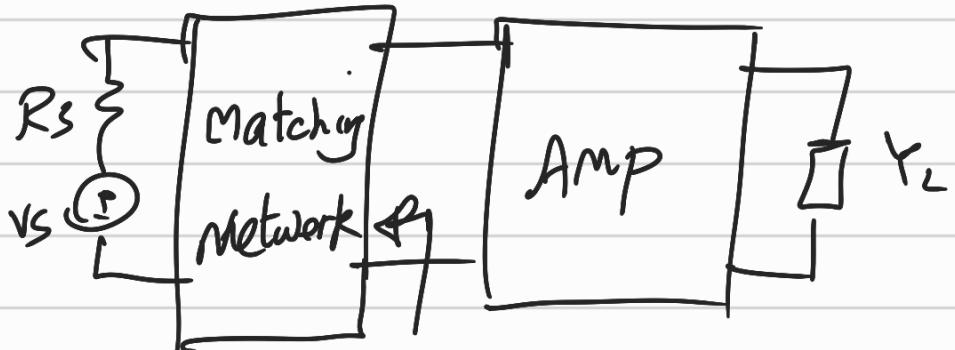
Ω

$$Z_{in} = \frac{G_L}{\frac{G_L^2 + C_1 \omega^2}{2}} - j \left(\frac{\frac{C_1 \omega}{2}}{G_L + C_1 \omega^2} - L_1 \omega \right)$$

36.2 Ω $\frac{C_1 \omega}{2} = 11.7 \Omega$

C₁, L₁ . مـلـفـ

(7)



\$Y_S

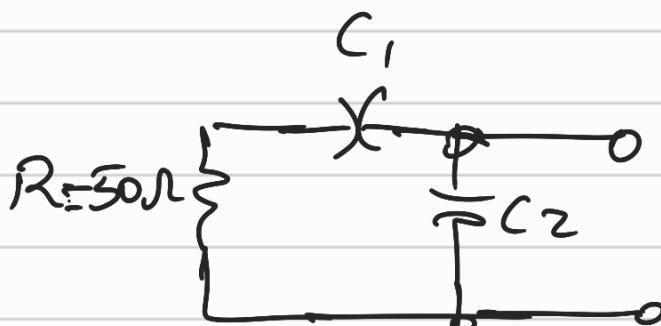
$$R_S = 50\Omega$$

$$Y_S = 2 + j3 \cdot 3 \text{ m}\omega$$

$$f = 100 \text{ MHz}$$

از تراویح
لکچر اول

برای ساخته راه از بین تصور با عالم
التوافق ممود چون در این ساز حله برخوبی نیست
است پس با این اتفاق اتفاق نمی شود



از طرح چون هدایت خروجی کو صفر نزدیک باشد
\$G = 0.02\$, \$G_s = 0.02\$

$$G_s = \frac{R(C_1\omega)^2}{1 + R^2(C_1\omega)^2} = 2 \text{ m}\omega . \quad \text{نیز}$$

$$\beta_s = -C_2\omega + \frac{C_1\omega}{1 + (RC_1\omega)^2} = 3.3 \text{ m}\omega$$

$$\frac{50 (C_1 \times 2\pi \times 10^8)^2}{1 + 2500 (C_1 \times 2\pi \times 10^8)^2} = 0.002 \text{ V}$$

$$C_1 =$$

$$C_2 (2\pi \times 10^8) = -0.0033 + \frac{C_1 (2\pi \times 10^8)}{1 + (50 C_1 \times 2\pi \times 10^8)^2}$$

$$C_2 =$$

جی اے ایم سی کو اسیں اخراج تقویت کئے۔

نہر میر رکور.

$$(G_s - 19.167)^2 + (B_s + 5)^2 = 361.12 \quad (9)$$

رُصانه کی فتح بارہ فریز، $F = 5 \text{ dB}$ سے مطابق
استینس بسٹری رائے اسکے ملک طرز نور رائے (ورنر)

$$(G_s - G_0 - \frac{F - F_{\min}}{2R_n})^2 + (B_s - B_0)^2 = \frac{F - F_{\min}}{2R_n} \left(2G_0 + \frac{F - F_{\min}}{2R_n} \right)$$

فتح بارہ فریز کا $F = 2.5$ میٹھا

$$(G_s - G_0 - x)^2 + (B_s - B_0)^2 = x (2G_0 + x)$$

باعظ مذکور کی رائے ملک طرز فنڈر کی توان نور:

$$B_0 = -5 \text{ mV}$$

$$\begin{cases} G_0 + x = 19.167 \\ x (2G_0 + x) = 361.12 \end{cases}$$



$$(19.167 - G_0)(G_0 + 19.167) = 361.12$$

$$G_0^2 = 7.404 \rightarrow G_0 = \begin{cases} 2.721 & \checkmark \\ -2.721 & \times \end{cases}$$

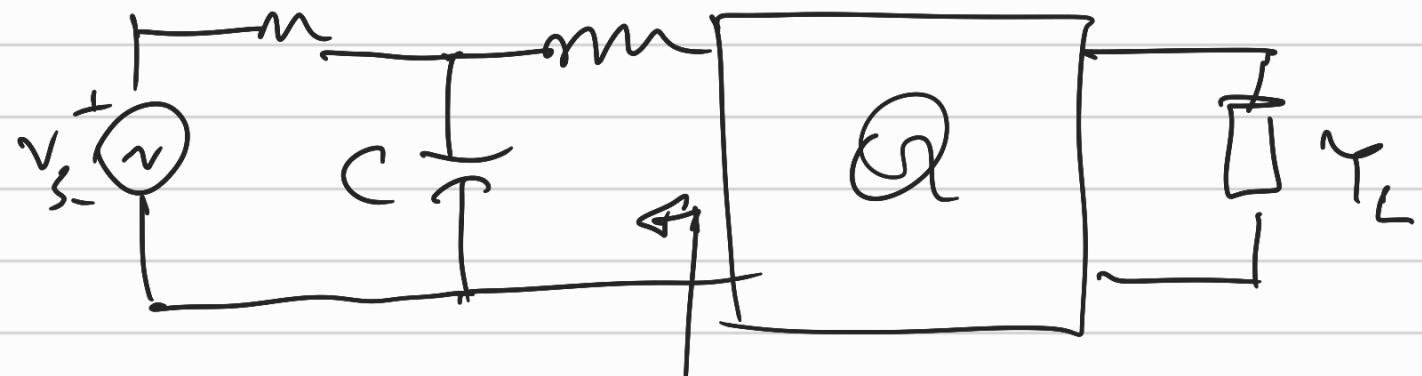
$$Y_0 = G_0 + jB_0 = 2.721 - j5 \text{ mV}$$

استینس بسٹری

$$\chi = 19.167 - G_0 = 16.446 \text{ m} \Omega$$

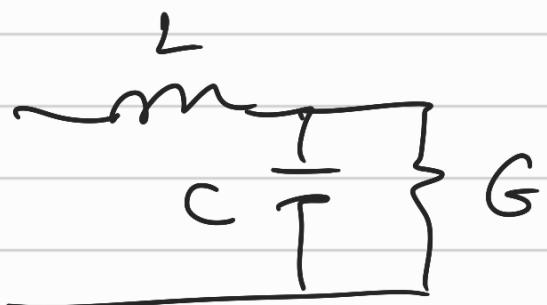
$$\chi = \frac{F - F_{min}}{2R_h}$$

$$R_S = 1 \text{ k}\Omega \quad L$$



$$Y_0 = 2.721 - j5 \text{ m} \Omega$$

$$Z_0 = \frac{1}{Y_0} = \frac{2.721 - j5}{32.4} = 0.0839 - j0.154 \text{ k}\Omega$$



$$Z_{in} = \frac{G}{G^2 + C^2 \omega^2} - j \cdot \left(\frac{C \omega}{G^2 + C^2 \omega^2} - L \omega \right)$$

$$\left\{ \frac{G}{G^2 + C^2 \omega^2} = 0.0839 \text{ kN} \right.$$

$$\left. \frac{C\omega}{G^2 + C^2 \omega^2} - L\omega = 0.154 \text{ kN} \right.$$

$$G = 0.001 \text{ V} \quad \leftarrow R_s = 1 \text{ kN}$$

$$\omega = 2\pi \times 7 \times 10 \text{ rad/sec}$$

↙

$$C \text{ & } L$$

~(٦) تقرير موجي لـ $F_{min} = 3 \text{ dB}$

$$\frac{F - F_{min}}{2R_n} = 16.446 \text{ mV}$$

$\frac{? - 3}{0}$

$$F_{dB} = 5 \rightarrow F_{dB} = 10 \log_{10} F \rightarrow F = 10^{\frac{F_{dB}/10}{0.5}} = 10 = 3.162$$

$$F_{min \text{ dB}} = 3 \rightarrow F_{min} = 10^{\frac{3}{10}} \rightarrow F_{min} = 1.995$$

$$\frac{3.162 - 1.995}{2R_n} = 16.446 \text{ mV} \Leftrightarrow R_n = 35.45 \Omega$$