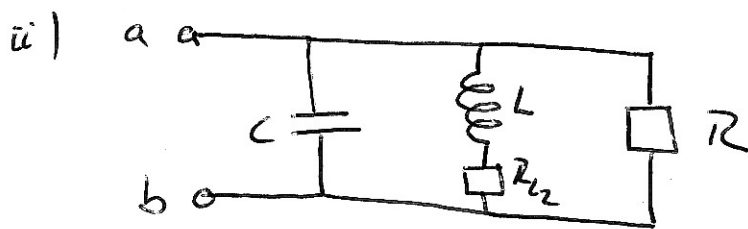


Za i) Parallelschwingkreis



$$C = \frac{(L_2 + L_3)C_1}{C_1 + L_2 + L_3} = 21 \mu F \quad L = L_1 + L_2 = 3,5 \text{ mH}$$

$$R = \frac{R_1 R_2}{R_1 + R_2} = 48 \text{ k}\Omega$$

$$\text{iii)} \quad f_0 = \frac{1}{2\pi\sqrt{LC}} = 18,564 \text{ kHz}$$

$$\text{iv)} \quad Z_{\text{in}} = R_x = R_{LP} \parallel R = \frac{R_{LP} R}{R_{LP} + R}$$

$$R_{LP} = \frac{R_x R}{R - R_x} = 9,6 \text{ k}\Omega$$

$$\text{v)} \quad Q = \frac{R_x}{\omega_0 L} = R_x \omega_0 C = R_x 2\pi f_0 C = 19,506$$

$$\text{vi)} \quad Q_L = \frac{\omega_0 L}{R_{L2}} = \frac{2\pi f_0 L}{R_{L2}}$$

$$R_{LP} = R_{L2}(1 + Q_L^2) = R_{L2} + \frac{(2\pi f_0 L)^2}{R_{L2}}$$

$$0 = R_{L2}^2 - R_{LP} R_{L2} + (2\pi f_0 L)^2 \rightarrow \begin{cases} 9582,6 \Omega \\ 17,393 \Omega \end{cases}$$

$$\Rightarrow R_{L2} = 17,393 \Omega$$

$$\text{vii)} \quad Q_{L1} = \infty \quad Q_{L2} = \frac{\omega_0 L_2}{R_{L2}} = \frac{2\pi f_0 L_2}{R_{L2}} = 16,77$$

2b $\frac{V_o}{V_x} = \frac{1}{1+j\omega R_2 C_2}$ $V_x = V_o (1+j\omega R_2 C_2)$

Knotenrglg in X

$$0 = I_{R1} - I_{C1} - I_{R2} = I_{R1} - I_{C1} - I_{C2}$$

$$\rightarrow \frac{V_o}{V_i} = \frac{1}{1+j\omega R_2 C_2 + j\omega R_1 C_1 + j\omega R_1 C_2 + (j\omega R_1 C_1)(j\omega R_2 C_2)}$$