

2-21) Komplex schema

$$R = 1 \text{ k}\Omega$$

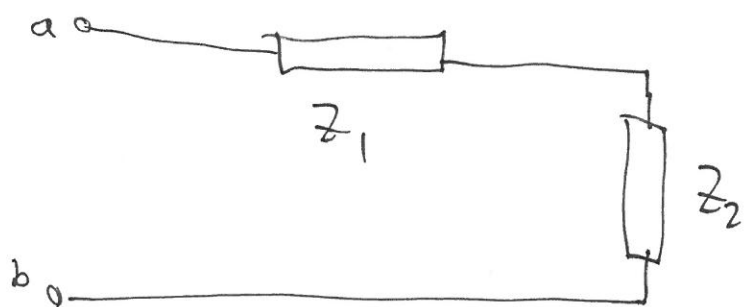
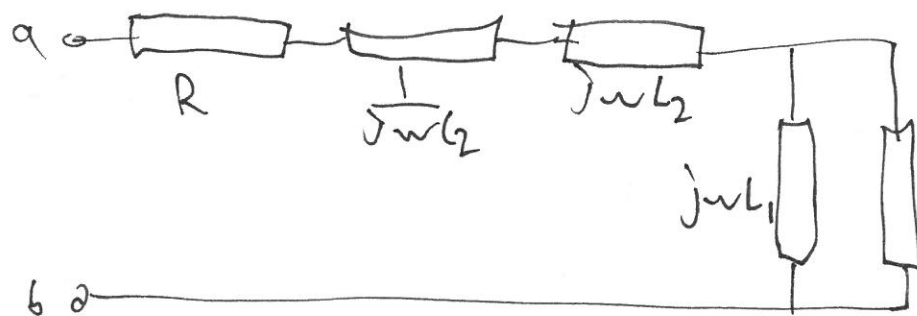
$$L_1 = 0.1 \text{ H}$$

$$C_1 = 5 \text{ nF}$$

$$C_2 = 500 \mu\text{F}$$

$$L_2 = 200 \text{ mH}$$

$$\omega = 100 \text{ rad/s}$$



$$Z_1 = R + \frac{1}{j\omega C_2} + j\omega L_2$$

$$= 1\text{k} + \frac{1}{j \cdot 100 \cdot 500\mu} + j \cdot 100 \cdot 200\text{m}$$

$$= 1\text{k} - j \cdot 20 + j \cdot 20$$

$$= 1\text{k} \Omega$$

$$Z_2 = j\omega L_1 \parallel \frac{1}{j\omega C_1} = \frac{j\omega L_1}{j\omega C_1} = \frac{0.1}{5\text{n}} = \frac{j\omega L_1 + \frac{1}{j\omega C_1}}{j\omega L_1 + \frac{1}{j\omega C_1}} = \frac{j \cdot 100 \cdot 0.1 + \frac{1}{j \cdot 100 \cdot 5\text{n}}}{j \cdot 100 + \frac{1}{j \cdot 100 \cdot 2\text{M}}} = \frac{20\text{M}}{j \cdot 10 + \frac{1}{j \cdot 2\text{M}}} = \frac{20\text{M}}{j \cdot (10 - 2\text{M})} = -j \frac{20\text{M}}{10 - 2\text{M}} = j \cdot 10$$

$$Z_{ab} = Z_1 + Z_2 = 1000 + j \cdot 10$$

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