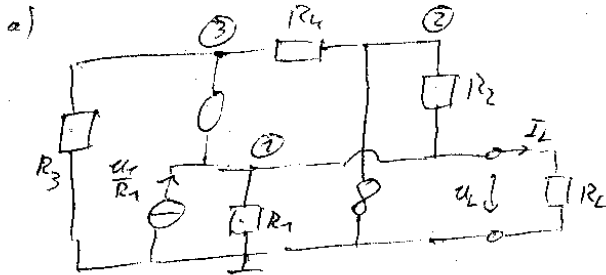


Aufgabe B3)



b)

$$\begin{bmatrix} \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} & -\frac{1}{R_2} \\ -\frac{1}{R_2} & \frac{1}{R_2} + \frac{1}{R_4} \\ & -\frac{1}{R_4} & \frac{1}{R_4} + \frac{1}{R_L} \end{bmatrix} \begin{bmatrix} u_{K1} \\ u_{K2} \\ u_{K3} \end{bmatrix} = \begin{bmatrix} \frac{u_1}{R_1} \\ 0 \\ 0 \end{bmatrix}$$

$\sim Y_{KK} \qquad \quad -u_{Kk} \qquad = \underline{c_k}$

c)

$$\begin{bmatrix} \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_L} & -\frac{1}{R_2} \\ \frac{1}{R_4} + \frac{1}{R_3} & -\frac{1}{R_4} \end{bmatrix} \begin{bmatrix} u_{K1} \\ u_{K2} \end{bmatrix} = \begin{bmatrix} \frac{u_1}{R_1} \\ 0 \end{bmatrix}$$

d) $u_L = u_{K1}$

$$\left. \begin{aligned} \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_L} \right) u_{K1} - \frac{1}{R_2} u_{K2} &= \frac{u_1}{R_1} \\ \left(\frac{1}{R_4} + \frac{1}{R_3} \right) u_{K1} - \frac{1}{R_4} u_{K2} &= 0 \end{aligned} \right\} \Rightarrow \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_L} \right) u_{K1} - \frac{1}{R_2} \left(1 + \frac{R_4}{R_3} \right) u_{K1} = \frac{u_1}{R_1}$$

$$\Rightarrow \frac{u_1}{u_L} = 1 + \frac{R_1}{R_2} + \frac{R_1}{R_L} - \frac{R_1}{R_2} - \frac{R_1 R_4}{R_2 R_3} = 1 + \frac{R_1}{R_L} - \frac{R_1 R_4}{R_2 R_3}$$

e) $I_L = \frac{u_L}{R_L} = \frac{u_1}{R_L \left(1 + \frac{R_1}{R_L} - \frac{R_1 R_4}{R_2 R_3} \right)}$

f) $\frac{R_2 R_4}{R_2 R_3} = 1$