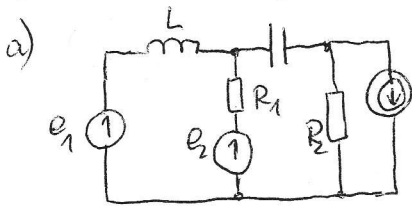
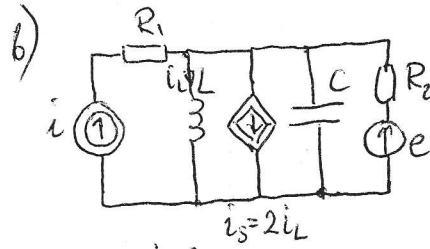


Circuits & systems Tutorials No 7 (repetition)

1. Determine the state space description in the circuits

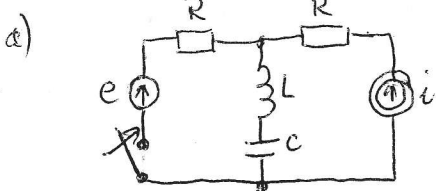


$$y = \begin{bmatrix} u_L \\ i_C \\ u_{R2} \end{bmatrix}$$



$$y = \begin{bmatrix} i_C \\ u_{R1} \\ u_{R2} \end{bmatrix}$$

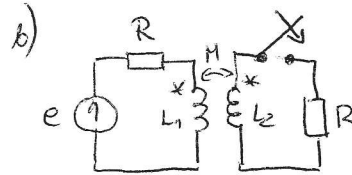
2. Determine $u_C(t)$, $i_L(t)$ in transient using state-space approach



$$e(t) = 20\sqrt{2} \sin t$$

$$i(t) = 4\sqrt{2} \sin(t + 90^\circ)$$

$$R = 2\Omega, L = 1H, C = 1F$$

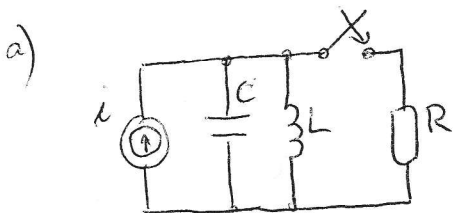


$$e(t) = 20\sqrt{2} \sin t$$

$$R = 5\Omega$$

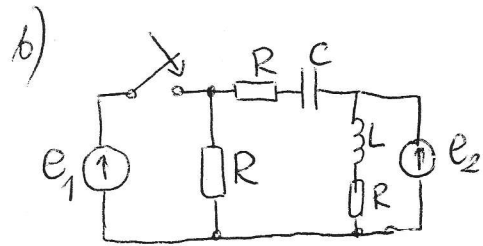
$$L_1 = 1H, L_2 = 2H, M = 1H$$

3. Determine $u_C(t)$, $i_L(t)$ in transient after switching



$$i(t) = 4\sqrt{2} \sin(t + 90^\circ)$$

$$L = 1H, C = 2F, R = 4\Omega$$



$$e_1 = 20V, e_2 = 10V$$

$$R = 10\Omega, L = 1H, C = 100\mu F$$