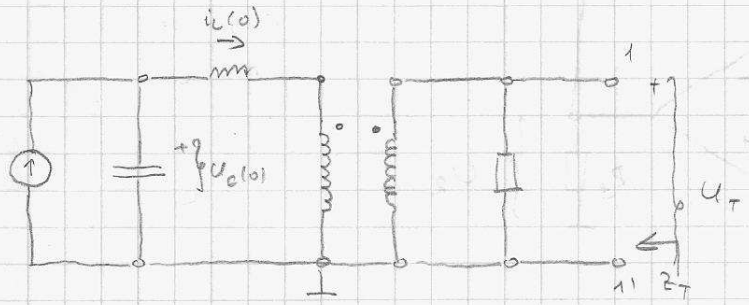
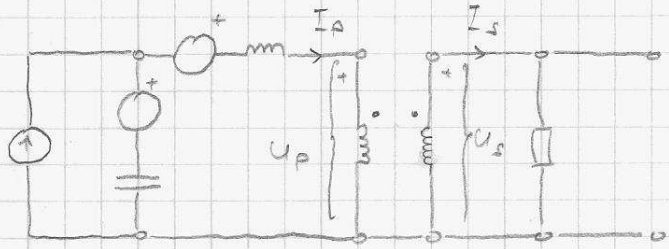
Ponovljeni 2. MI ELEKTRU 2006.

① → nadomjestiti po Theveninu

$R = 1$ ; $L = 1$ $C = 1$ $n = 2$ $i_0(t) = \delta(t)$

$u_c(0) = 1$ $i_L(0) = 2$



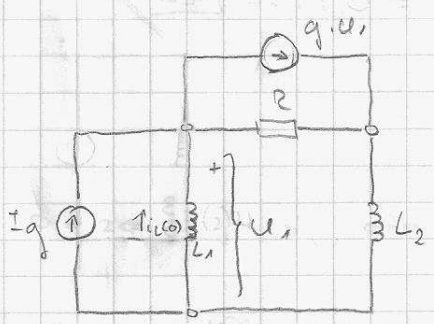

$$U_p = \frac{U_s}{n}$$

$$I_p = n\, I_s$$

② → orijentirani graf; matrica incidencija

→ topološkom analizom sustav jednadžbi čvorova u matr. obliku

→ matrica $Y_b$ mora biti regularna




$$U_b = Z_b \cdot I_b + U_{ob}$$

$U_{ob}$ → vektor početnih uvjeta i nezavisnih izvora

→ temeljni sustav čvorova (metoda čvorova)

$$Y_v\, U_v(s) = I_v(s)$$

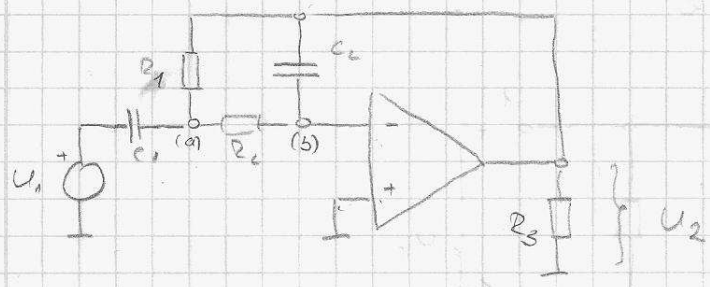
$$Y_v = A \cdot Z_b^{-1} A^T$$

$$I_v = A \cdot Z_b^{-1} \cdot U_{ob}$$

③

$$T(s) = \frac{U_2(s)}{U_1(s)} = ?$$

$R_1 = R_2 = R_3 = 1 \qquad C_1 = C_2 = 1$




④

$$T(s) = \frac{U_{iz}(s)}{U_{ul}(s)} = -\frac{s}{s^2+s+1}$$

za $u_{ul}(t) = 20\cos 2t$

$u_{iz}(t) = ?$

$$s = j\omega \Rightarrow T(j\omega) = \frac{-j\omega}{(1-\omega^2)+j\omega}$$

$$T(2\omega) = \frac{-2j}{-3+2j} = \frac{2j}{3-2j} \cdot \frac{3+2j}{3+2j}$$

$$= \frac{6j-4}{13} = -\frac{4}{13} + j\frac{6}{13} = 0{,}554 \angle 124^\circ$$

$u_{iz} = 11{,}094\cos(2t + 124^\circ)$

⑤ $H(s) = \frac{U_{iz}(s)}{U_{ul}(s)}$ . Prijenosna = ? ako je $H(s) = \frac{3}{2} \Rightarrow s = 0$ ,

Odziv = ? ako je pobuda $u_{ul}(t) = \delta(t)$

$$H(s) = \frac{k(s+3)}{(s+1+j)(s+1-j)(s+2)}$$

za $s = 0 \Rightarrow k = 2$

$$H(s) = \frac{2(s+3)}{(s+2)(s^2+2s+2)}$$