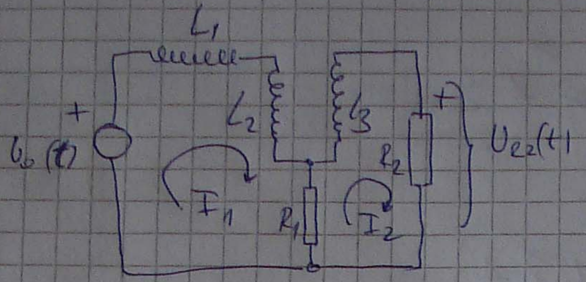
1A



$U_0(t) = \delta(t) \;\circ\!\!-\; \frac{1}{s}$

$I_2 R_2 = U_{R2}$

$R_2 = 1 \Rightarrow \underline{\underline{I_2 = U_{R2}}}$

(1) $I_1 \left(sL_1 + sL_2 + R_1 \right) - I_2 R_1 = U_0(t)$

(2) $-I_1 R_1 + I_2 \left(R_1 + sL_3 + R_2 \right) = \varnothing$

(1) $I_1 = \dfrac{U_0(t) + I_2 R_1}{sL_1 + sL_2 + R_1}$

(1) $\cup$ (2) $- \dfrac{U_0(t) + I_2 R_1}{sL_1 + sL_2 + R_1} \cdot R_1 + I_2 \left(R_1 + sL_3 + R_2 \right) = \varnothing$

$$I_2 \left(R_1 + sL_3 + R_2 - \frac{R_1}{sL_1 + sL_2 + R_1} \right) = \frac{U_0(t)}{sL_1 + sL_2 + R_1}$$

$$I_2 \left(\frac{(R_1 + sL_3 + R_2)(sL_1 + sL_2 + R_1) - R_1}{sL_1 + sL_2 + R_1} \right) = \frac{U_0(t)}{sL_1 + sL_2 + R_1}$$

$$I_2 = \frac{U_0(t)}{s^2 (L_2 L_3 + L_1 L_3) + s (L_1 R_1 + L_2 R_1 + L_3 R_1 + L_1 R_2 + L_2 R_2) + R_1^2 + R_1 R_2 - R_1}$$

$$I_2 = \frac{1}{s(12 s^2 + 10 s + 1)} = U_{R2}(s)$$

$U_{R2}(t) = \mathcal{L}^{-1} \left[U_{R2}(s) \right]$

$$\frac{1}{s(12s^2+10s+1)} = \frac{A}{s} + \frac{Bs+C}{12s^2+10s+1}$$

$$1 = A(12s^2+10s+1) + (Bs+C)s$$

$$\underline{\underline{s=0}} \Rightarrow \quad \underline{\underline{1=A}}$$

$$\underline{\underline{s=1}} \Rightarrow \quad 1 = 23 + B + C$$

$$\underline{\underline{C+B=-22}}$$

$$\underline{\underline{s=-1}} \Rightarrow \quad 1 = 3 + B - C$$

$$\underline{\underline{-2 = B-C}}$$

$$C + C + (-2) = -22$$

$$2C = -20$$

$$\underline{\underline{C=-10}} \quad , \quad \underline{\underline{B=-12}}$$

$$I_2(s) = \frac{1}{s} - \frac{12s+10}{12s^2+10s+1} \Big/ \!:12 =$$

$$I_2(s) = \frac{1}{s} - \frac{s+\frac{5}{6}}{s^2+\frac{5}{6}s+\frac{1}{12}} = \frac{1}{s} - \left[\frac{s+\frac{5}{12}}{\left(s+\frac{5}{12}\right)^2-\frac{13}{144}} + \frac{\frac{5}{12}}{\left(s+\frac{5}{12}\right)^2-\frac{13}{144}}\right]$$

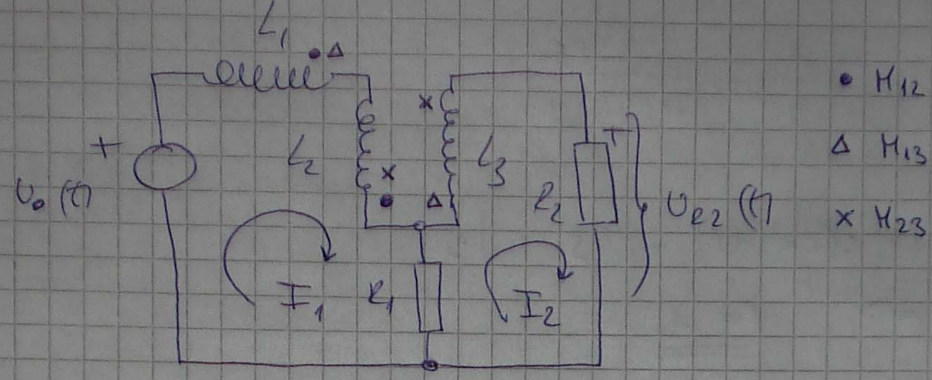
$$I_2(s) = \frac{1}{s} - \frac{s+\frac{5}{12}}{\left(s+\frac{5}{12}\right)^2-\left(\sqrt{\frac{13}{144}}\right)^2} - \sqrt{\frac{144}{13}}\,\frac{5}{12}\,\frac{\sqrt{\frac{13}{144}}}{\left(s+\frac{5}{12}\right)^2-\left(\sqrt{\frac{13}{144}}\right)^2}$$

$$u_{C2}(t) = i_2(s) = 1 - \left[ch\left(\sqrt{\frac{13}{144}}\cdot t\right) - \frac{5}{\sqrt{13}}\,sh\left(\sqrt{\frac{13}{144}}\cdot t\right)\right] e^{-\frac{5}{12}t}$$

ZA OVOG LAPLACEA NISAM SIGURAN DAL JE DOBAR. AKO NETKO HOĆE NEK PROVJERI.

NAJBITNIJI JE PRVI DIO ZADATKA!

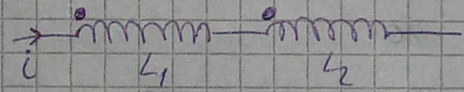
(1B)



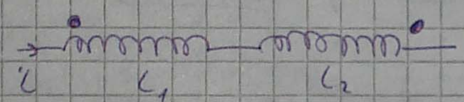
(1) $$I_1(sL_1 + sL_2 + R_1) - I_2 \cdot R_1 = u_0(t)$$

↳ OVO BI BILA JEDN. PETLJE 1 BEZ MEĐUINDUKTIVITETNIH VEZA (KAO U 1A)

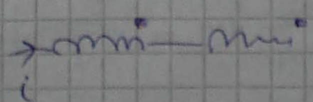
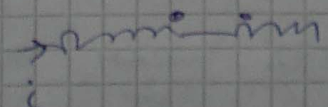
PODSJETNIK



$L_1 + L_2 + 2M_{12}$



$L_1 + L_2 - 2M_{12}$

- MEĐUINDUKTIVITET PROMATRAMO KAO JEDNU „NOVU ZAVOJNICU" KOJA OVISNO O ORIJENTACIJI TOČKICA INDUCIRA U SMJERU STRUJE ILI U SMJERU SUPROTNOM OD SMJERA STRUJE (DODAJE ILI ODUZIMA NAPON)
- BITNO JE SAMO DALI STRUJA OBADVA PUTA „GAĐA" NA TOČKICU ILI NA NEOZNAČENI DIO, ŠTO DAJE DA JE SLUČAJ (1) ISTI KAO:  , A SLUČAJ (2) KAO: 

(1) SA MEĐUIND.

$$(1)\quad I_1\left(sL_1+sL_2+R_1+2M_{12}s\right)-I_2\left[R_1+s\left(M_{13}-M_{23}\right)\right]=U_0(t)$$

$$(2)\quad -I_1\left[R_1+s\left(M_{13}-M_{23}\right)\right]+I_2\left(R_1+sL_3+R_2\right)=\varnothing$$

SAD ĆEMO ODMAH UVRSTITI VRIJEDNOSTI DA NE ~~KOMPLICIRAMO~~ KOMPLICIRAMO JE SUSTAV BAŠ NIJE JEDNOSTAVAN A BROJEVI SU OK, PA IMAMO:

$$(1)\quad I_1\left(4s+1\right)-I_2\left(-s+1\right)=\frac{1}{s}$$

$$(2)\quad -I_1\left(-s+1\right)+I_2\left(4s+2\right)=\varnothing$$

MALO SREĐIVANJA DAJE:

$$I_2=\frac{1-s}{s\left(15s^2+14s+1\right)}$$

$$U_{R_2}=R_2\cdot I_2=\frac{1-s}{s\left(15s^2+14s+1\right)}$$

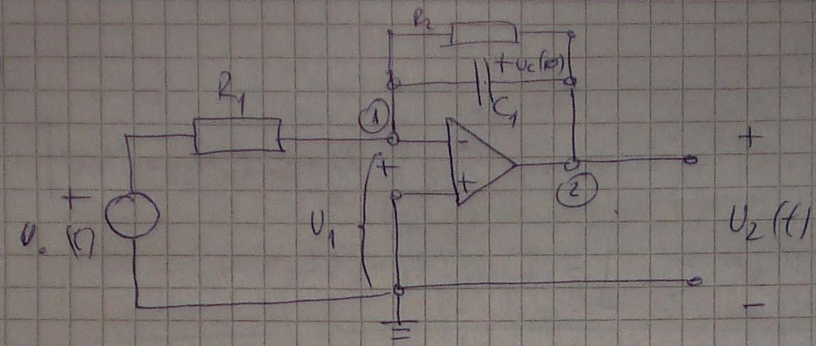
$$15s^2+14s+1=0$$

$$s_{1,2}=-\frac{7\pm\sqrt{34}}{15}\quad;\quad\frac{1-s}{s\left(15s^2+14s+1\right)}=\frac{A}{s}+\frac{B}{s+\frac{7+\sqrt{34}}{15}}+\frac{C}{s+\frac{7-\sqrt{34}}{15}}$$

RAČUN DAJE: $A=1;\ B=\frac{15}{2\sqrt{34}};\ C=-\frac{15}{2\sqrt{34}}$

$$U_{R_2}(t)=\left[1+\frac{15}{2\sqrt{34}}e^{-\frac{7+\sqrt{34}}{15}t}-\frac{15}{2\sqrt{34}}e^{-\left(\frac{7-\sqrt{34}}{15}\right)t}\right]S(t)$$

2



(1) $$U_1\left(\frac{1}{R_1}+\frac{1}{R_2}+sC_1\right)-U_2\left(\frac{1}{R_2}+sC_1\right)=\frac{U_0(t)}{R_1}-C_1u_c(0)$$

(2) $$-U_1\left(\frac{1}{R_2}+sC_1\right)+U_2\left(\frac{1}{R_2}+sC_1\right)=C_1u_c(0)$$

$U_1=\emptyset$ ZBOG PRIVIDNOG KRATKOG SPOJA!

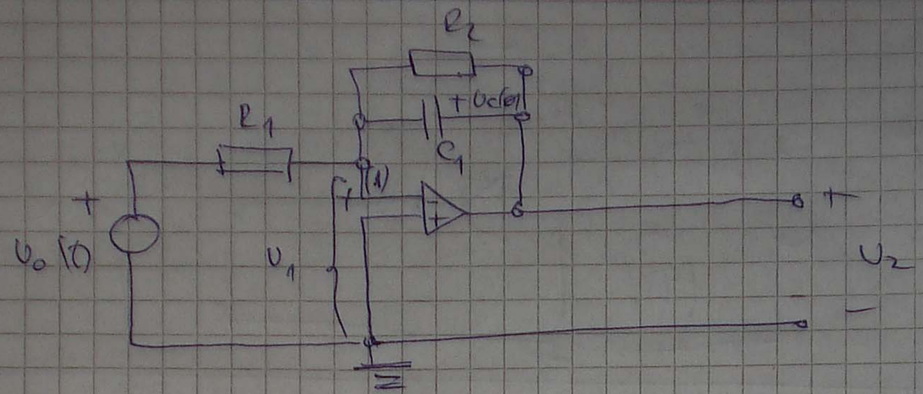
iz (1) $$U_2=\frac{C_1u_c(\emptyset)-\frac{U_0(t)}{R_1}}{\frac{1}{R_2}+sC_1}=\frac{1-\frac{1}{s}}{1+s}=\frac{\frac{s-1}{s}}{1+s}$$

$$U_2(s)=\frac{2s-(1+s)}{s(1+s)}=\frac{2}{1+s}-\frac{1}{s}$$

$$u_2(t)=\left(2e^{-t}-1\right)S(t)$$

OVDJE SAM JA PRETPOSTAVIO DA ĆE ME JEDN. (1) DOVESTI DO TOČNOG RJEŠENJE. NISAM BAŠ SIGURAN U TOČNOST OVOG POSTUPKA. SLJEDEĆI FAJL SADRŽI ISTI TAJ ZADATAK RJEŠEN NA 100% TOČAN I RAZUMLJIV NAČIN. OVO SAM STAVIO ZA ONE KOJI ŽELE EKSPERIMENTIRATI :)

(2)



POŠTO U TOČKI (1) VLADA NAPON ØV (ZBOG V.K.S.) GLEDAT ĆEMO SUMU STRUJA KOJE ULAZE U TAJ ČVOR JER ZNAMO DA ON MORA BIT Ø.

$$\frac{U_0-U_1}{R_1}+\frac{U_2-U_1}{R_2}+\frac{U_2-U_1}{\frac{1}{sC_1}}-\frac{\frac{U_c(0)}{s}}{\frac{1}{sC}}=0$$

STRUJE KOJE ULAZE U ČVOR SU UZETE SA + PREDZNAKOM, A ONE KOJE IZLAZE SA −

U_2 i U_0 SU VEĆI OD U_1, ZATO NJIHOVE STRUJE IMAJU + PREDZNAK (JER ULAZE U ČVOR)

STRUJA ODREĐENA SA $U_c(0)$ JE − JER IDE IZ ČVORA. $U_1 = 0$ (ZBOG V.K.S.)

RJEŠAVANJE VODI NA ISTO RJEŠENJE:

$$U_2(s)=\frac{1}{s+1}-\frac{1}{s}$$

③

(1) $$U_1\left(\frac{1}{R_1}+sC_1+\frac{1}{sL_2}\right)-U_2\frac{1}{sL_2}=C_1 u_{C1}(0)+\frac{u_0(t)}{R_1}$$

(2) $$-U_1\frac{1}{sL_2}+U_2\left(\frac{1}{R_2}+sC_2+\frac{1}{sL_2}\right)=0$$

UVRŠTENJE DAJE:

(3) $$U_1=U_2\left(2s^2+2s+1\right)$$

(3) u (1)

$$U_2\left(\frac{2s(2s^2+2s+1)^2-2s}{(2s)^2}\right)=2$$

$$U_2\,\frac{(2s^2+2s+1)^2-1}{2s}=2 \qquad 1^2$$

$$a^2-s^2=(a-s)(a+s)$$

$$U_2=\frac{4s}{(2s^2+2s+1-1)(2s^2+2s+1+1)}$$

$$U_2=\frac{4s}{(2s^2+2s)(2s^2+2s+2)}$$

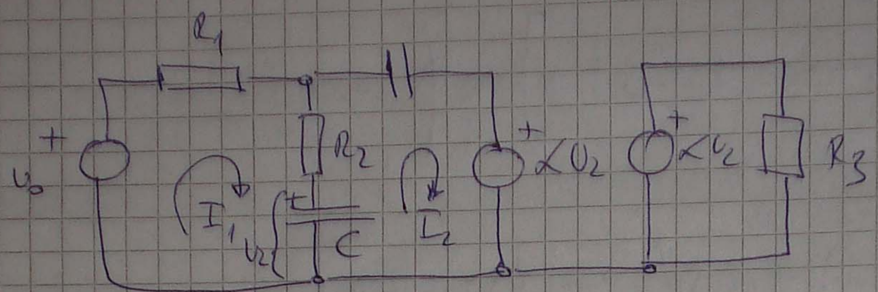
$$U_2=\frac{1}{(s+1)(s^2+s+1)}$$

$$U_2(s)=\frac{1}{s+1}-\frac{s}{s^2+s+1}$$ (METODOM NEODREĐENIH KOEF)

$$U_2(s)=\frac{1}{s+1}-\frac{s+\frac{1}{2}}{(s+\frac{1}{2})^2+(\frac{\sqrt{3}}{2})^2}+\frac{1}{\sqrt{3}}\,\frac{\frac{\sqrt{3}}{2}}{(s+\frac{1}{2})^2+(\frac{\sqrt{3}}{2})^2}$$

$$u_2(t)=\left[e^{-t}-\cos\left(\frac{\sqrt{3}}{2}t\right)e^{-\frac{1}{2}t}+\frac{1}{\sqrt{3}}\sin\left(\frac{\sqrt{3}}{2}t\right)e^{-\frac{1}{2}t}\right]S(t)$$

③



(1) $$(I_2 - I_1)\left(R_2 + \frac{1}{sC}\right) + I_2 \frac{1}{sC} + \alpha U_2 = \varnothing$$

(2) $$(I_1 - I_2)\left(R_2 + \frac{1}{sC}\right) + I_1 R_1 - U_0 = \varnothing$$

$$(I_1 - I_2)\frac{1}{sC} = U_2$$

(3) $$\underline{\underline{I_1 = U_2 sC + I_2}}$$

(3) u (1) i (2)

(1) $$-U_2 sC\left(R + \frac{1}{sC}\right) + I_2 \frac{1}{sC} + \alpha U_2 = \varnothing$$

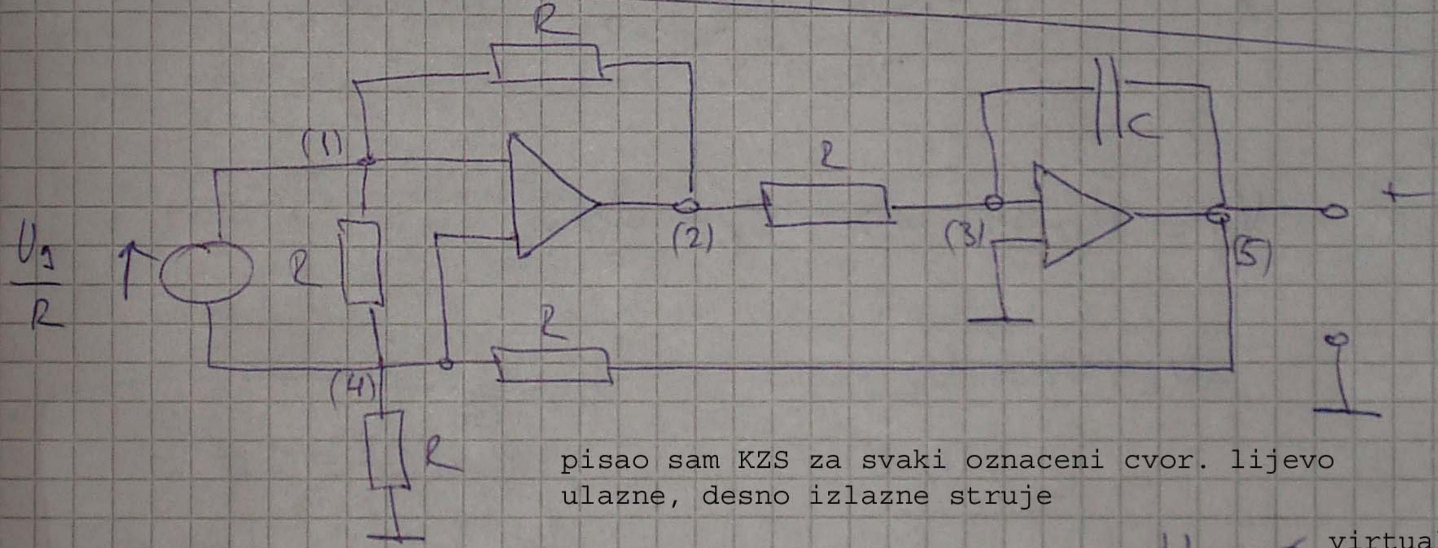
(2) $$U_2 sC\left(R + \frac{1}{sC}\right) + R\left(U_2 sC + I_2\right) - U_0 = \varnothing$$

$$I_2 = \left[-\alpha U_2 + (U_2 sC)\left(R + \frac{1}{sC}\right)\right] sC$$

UVRŠTENJEM I_2 U (1) I SREĐIVANJEM IZLAZI:

$$U_2 = \frac{U_0}{4s^2 + 2s + 1} = \frac{1}{4s^2 + 2s + 1} = \frac{1}{4}\frac{1}{s^2 + \frac{1}{2}s + \frac{1}{4}}$$

$$= \frac{1}{4}\frac{4}{\sqrt{3}}\frac{\frac{\sqrt{3}}{4}}{(s+\frac{1}{4})^2 + (\frac{\sqrt{3}}{4})^2} \circ\!\!-\!\!\bullet \frac{1}{\sqrt{3}} e^{-\frac{1}{4}t} \sin\left(\frac{\sqrt{3}}{4}t\right) S(t)$$



pisao sam KZS za svaki oznaceni cvor. lijevo ulazne, desno izlazne struje

$U_3 = \emptyset$ virtualni kratki spoj

$U_1 = U_4$ virtualni kratki spoj

$U_{izl} = (U_5 - U_4) + U_4 = U_5$

(1) $$\frac{U_g}{R} = \frac{U_1 - U_4}{R} + \frac{U_1 - U_2}{R}$$

(2) $$\emptyset = \frac{U_2 - U_1}{R} + \frac{U_2 - U_3}{R}$$

(3) $$\emptyset = \frac{U_3 - U_2}{R} + (U_3 - U_5)\, sC_1$$

(4) $$-\frac{U_g}{R} = \frac{U_4 - U_1}{R} + \frac{U_4}{R} + \frac{U_4 - U_5}{R}$$

(5) $$\emptyset = \frac{U_5 - U_3}{1}\, sC_1 + \frac{U_5 - U_4}{R}$$

(1) $\frac{U_g}{R} = \frac{U_1 - U_2}{R}$

(2) $\emptyset = \frac{U_2 - U_1}{R} + \frac{U_2}{R}$

(3) $\emptyset = -\frac{U_2}{R} - U_5 sC$

(4) $-\frac{U_g}{R} = \frac{U_1}{R} + \frac{U_1 - U_5}{R}$

(5) $\emptyset = U_5 sC + \frac{U_5 - U_1}{R}$

(1) $U_g = U_1 - U_2 \Rightarrow U_1 = U_g + U_2$

(2) $-U_2 + U_1 = U_2$

$U_1 = U_2 \cdot 2$

(1)(2) $2U_2 = U_g + U_2$

$\frac{U_1}{2} = U_2 = U_g$

$\cancel{U_2 = U_5 sCR}$

$\cancel{U_g = -U_5 sCR}$

$\cancel{U_5 = -}$

(5)

$U_5 sCR = U_1 - U_5$

$U_5(1 + sCR) = U_g \cdot 2$

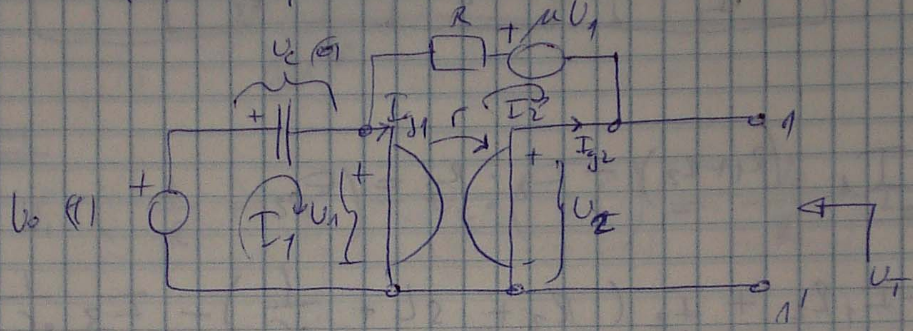
$U_5 = \frac{2 \cdot U_g}{(1 + sCR)}$

$U_5 = \frac{2}{s} \cdot \frac{1}{2s + 2}$

PO THEVENINU (1)-(1')

$R = \frac{1}{2}, \quad C = 1, \quad \mu = \frac{1}{2}, \quad r = \frac{1}{2}$

$U_C(0) = 2, \quad U_0(t) = S(t)$



a) $U_T = ?$

$$I_1 \frac{1}{sC} = U_0 - \frac{U_C(0)}{s} - U_1$$

$$I_2 R = U_1 - \mu U_1 - U_2$$

$U_1 = -r I_{g2} \qquad I_{g2} = -I_2$

$U_2 = -r I_{g1} \qquad I_{g1} = I_1 - I_2$

$$I_1 \frac{1}{sC} = U_0 - \frac{U_C(0)}{s} - r I_2$$

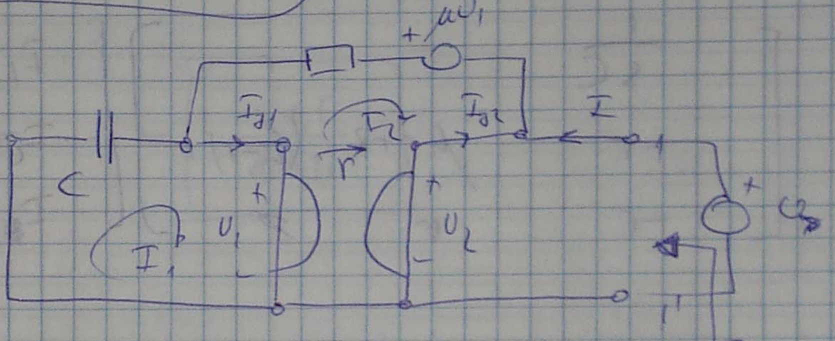
$$I_2 R = r I_2 - \mu r I_2 + r I_1 - r I_2$$

$$I_1 \cdot \frac{1}{sC} + r \cdot I_2 = U_0 - \frac{U_c(0)}{s}$$

$$-r \cdot I_1 + (\mu + R) I_2 = 0$$

$$\boxed{U_T = \frac{1}{2} \frac{1}{s+3}}$$

b)



$$Z_T = \frac{U_0}{I}$$

$$-I_1 \frac{1}{sC} = U_1$$

$$-U_1 + I_2 R + \mu U_1 + U_2 = 0$$

$$I_2 \cdot R = U_1 - \mu U_1 - U_2$$

$$U_2 = U$$

$$U_1 = -r I_{g2}$$

$$U_2 = -r I_{g1}$$

$$I_{g2} = -I_2 - I$$

$$I_{g1} = I_1 - I_2$$

$$U_1 = r I_2 + r I$$

$$U_2 = -r I_1 + r I_2$$

$$I_1 \frac{1}{sC} + rI_2 + rI = \emptyset$$

$$\mu(-1)\cdot(rI_2 + rI) + I_2 \cdot R + (rI_1 + rI_2) = \emptyset$$

$$-rI_1 + rI_2 - U = \emptyset$$

$$\begin{bmatrix} \frac{1}{sC} & r & r \\ -r & \mu r + R & (\mu-1)r \\ -r & r & \emptyset \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I \end{bmatrix} = \begin{bmatrix} \emptyset \\ \emptyset \\ U \end{bmatrix}$$

DET I_3

DET. SUSTAVA

$$I = \frac{\Delta_3}{\Delta}$$

$$\Delta = \begin{vmatrix} \frac{1}{sC} & r & r \\ -r & \mu r + R & (\mu-1)r \\ -r & r & \emptyset \end{vmatrix} = r^2\left[R + \frac{1}{sC}(1-\mu)\right]$$

$$\Delta_3 = \begin{vmatrix} \frac{1}{sC} & r & \emptyset \\ -r & \mu r + R & \emptyset \\ -r & r & U \end{vmatrix} = U\left[\frac{1}{sC}(\mu r + R) + r^2\right]$$

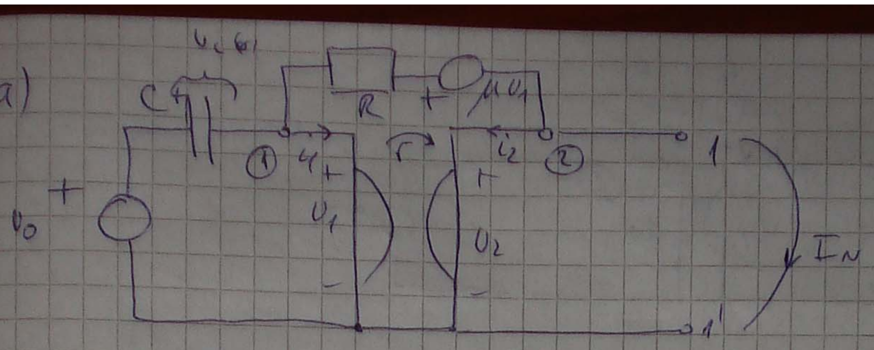
$$\cancel{}$$

$$I = \frac{U\left[\frac{1}{sC}(\mu r + R) + r^2\right]}{r^2\left[R + \frac{1}{sC}(1-\mu)\right]}$$

$$Z_T = \frac{U}{I} = \frac{r^2\left[R + \frac{1}{sC}(1-\mu)\right]}{\frac{1}{sC}(\mu r + R) + r^2}$$

$$= \dots = \boxed{\frac{s+1}{2(s+3)}}$$

7 a)



(1) $$U_1\left(sC_1+\frac{1}{R}\right)-U_2\left(\frac{1}{R}\right)=-Cu_c(0)+U_0 sC+\frac{\mu U_1}{R}$$

$-i_1$

(2) $$-U_1\left(\frac{1}{R}\right)+U_2\left(\frac{1}{R}\right)=-\frac{\mu U_1}{R}+I_{g2}-I_N$$

$\boxed{U_2=\varnothing \text{ ZBOG KRATKOG SPOJA } 1-1'}$

$$U_1=rI_{g2}\quad;\quad U_2=-rI_{g1}$$

$$I_{g2}=\frac{U_1}{r}\quad;\quad I_{g1}=-\frac{U_2}{r}$$

(1) $$U_1\left(sC+\frac{1}{R}-\frac{\mu}{R}\right)-U_2\left(\frac{1}{R}+\frac{1}{r}\right)=U_0 sC-Cu_c(0)$$

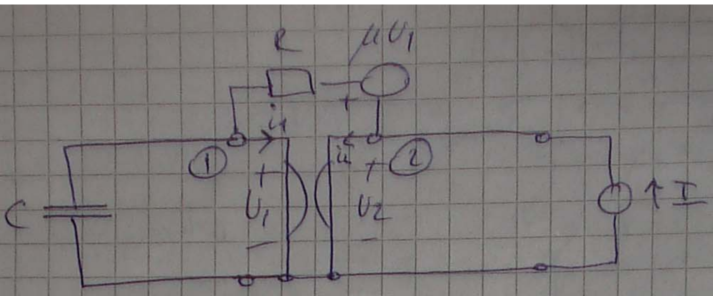
(2) $$-U_1\left(\frac{1}{R}+\frac{1}{r}-\frac{\mu}{R}\right)+\underbrace{U_2\left(\frac{1}{R}\right)}_{=\varnothing}=-I_N$$

$$I_N=U_1\left(\frac{1-\mu}{R}-\frac{1}{r}\right)$$

$$I_N(s)=\frac{\left(\frac{1-\mu}{R}-\frac{1}{r}\right)\left(U_0 sC-Cu_c(0)\right)}{sC+\frac{1-\mu}{R}}$$

$$I_N(s)=\frac{1}{s+1}$$

5)



(1) $$U_1\left(sC+\frac{1}{R}\right)-U_2\frac{1}{R}=-i_1+\frac{\mu U_1}{R}$$

(2) $$-U_1\frac{1}{R_1}+U_2\frac{1}{R}=-\frac{\mu U_1}{R}+I-i_2$$

$$U_1=rI_{g2} \Rightarrow i_2=\frac{U_1}{r}$$

$$U_2=-rI_{g1} \Rightarrow i_1=-\frac{U_2}{r}$$

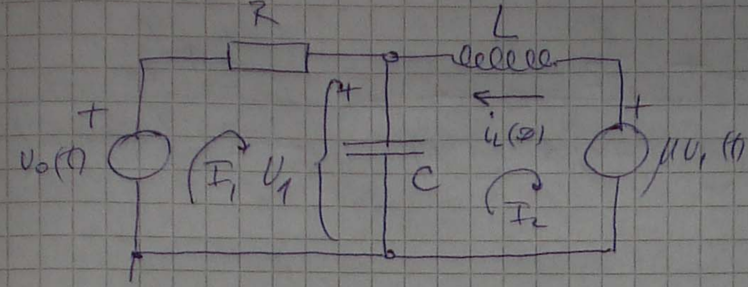
(1) $$U_1\left(sC+\frac{1-\mu}{R}\right)-U_2\left(\frac{1}{R}+\frac{1}{r}\right)=\cancel{0}$$

(2) $$-U_1\left(\frac{1-\mu}{R}-\frac{1}{r}\right)+U_2\frac{1}{R}=I$$

$$U_2=\frac{D_{U2}}{D_s}=\cdots=I\,\frac{r^2(1-\mu+sRC)}{R+r(srC+\mu)}$$

$$Y_N=\frac{I}{U_2}=\frac{2(s+3)}{s+1}$$

8



(1) $$I_1\left(R+\frac{1}{sC}\right) - I_2\left(\frac{1}{sC}\right) = v_0(t)$$

(2) $$-I_1\left(\frac{1}{sC}\right) + I_2\left(\frac{1}{sC}+sL\right) = -\mu v_1(t) - L\cdot i_L(0)$$

(3) $$(I_1 - I_2)\frac{1}{sC} = U_1$$

$$\underline{\underline{I_1 = U_1 sC + I_2}}$$

(1) $$(U_1 sC + I_2)\left(R+\frac{1}{sC}\right) - I_2\frac{1}{sC} = v_0(t)$$

(2) $$-(U_1 sC + I_2)\frac{1}{sC} + I_2\left(\frac{1}{sC}+sL\right) = -\mu U_1 - L\cdot i_L(0)$$

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(1) $$U_1(sCR+1) + I_2\left(-\cancel{\frac{1}{sC}} + \cancel{\frac{1}{sC}} + R\right) = v_0(t)$$

(2) $$U_1(\mu - 1) + I_2\left(\cancel{\frac{1}{sC}} + sL - \cancel{\frac{1}{sC}}\right) = -L\cdot i_L(0)$$

$$D_s = \begin{vmatrix} (sCR+1) & R \\ (\mu-1) & sL \end{vmatrix} ; \quad D_{U_1} = \begin{vmatrix} \frac{1}{s} & R \\ -\frac{1}{2} & sL \end{vmatrix}$$

$$U_1 = \frac{D_{U1}}{D_S} = \frac{L + \frac{R}{2}}{sL(sCR+1) + R(1-\mu)} = \frac{\frac{1}{2} + \frac{1}{2}}{\frac{1}{2}s\left(\frac{1}{3}s+1\right) + \left(1 - \frac{2}{3}\right)}$$

$$= \frac{1}{\frac{1}{6}s^2 + \frac{1}{2}s + \frac{1}{3}} = 6\,\frac{1}{s^2+3s+2}$$

$$= 6\,\frac{1+s-s}{s^2+3s+2} = 6\left[\frac{1+s-s}{(s+1)(s+2)}\right]$$

s^2+3s+2

$$s_{1,2} = \frac{-3 \pm \sqrt{9-8}}{2}$$

$$= \frac{-3 \pm 1}{2}$$

$s_1 = -2,\ s_2 = -1$

$$= 6\left[\frac{1}{s+2} - \frac{s}{(s+1)(s+2)}\right]$$

$$= 6\left[\frac{1}{s+2} + \left(\frac{1}{s+1} - \frac{2}{s+2}\right)\right]$$

$$= 6\left[\frac{1}{s+1} - \frac{1}{s+2}\right]$$

$$= 6\left(e^{-t} - e^{-2t}\right) S(t)$$

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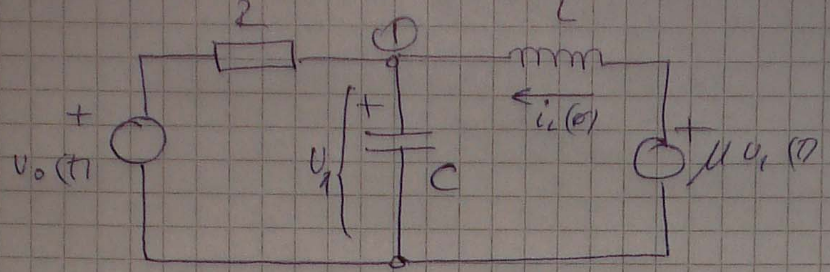


(1) $$U_1\left(\frac{1}{R}+sC+\frac{1}{sL}\right)=\frac{U_0(t)}{R}+\frac{i_L(0)}{s}+\mu U_1/sL$$

$$U_1=\frac{\frac{U_0(t)}{R}+\frac{i_L(0)}{s}}{\frac{1}{R}+sC+\frac{1}{sL}-\frac{\mu}{sL}}$$

$$\frac{\frac{2}{3}}{s\,\frac{1}{2}} \qquad \frac{4}{3s}$$

$$U_1=\frac{\frac{1}{s}+\frac{1}{s}}{1+\frac{1}{3}s+\frac{2}{s}-\frac{4}{3s}}$$

$$U_1(s)=\frac{\frac{2}{s}}{1+\frac{1}{3}s+\frac{2}{3s}}=\frac{\frac{2}{\cancel{s}}}{\frac{3s+s^2+2}{3\cancel{s}}}$$

$$\boxed{U_1(s)=\frac{6}{s^2+3s+2}}$$

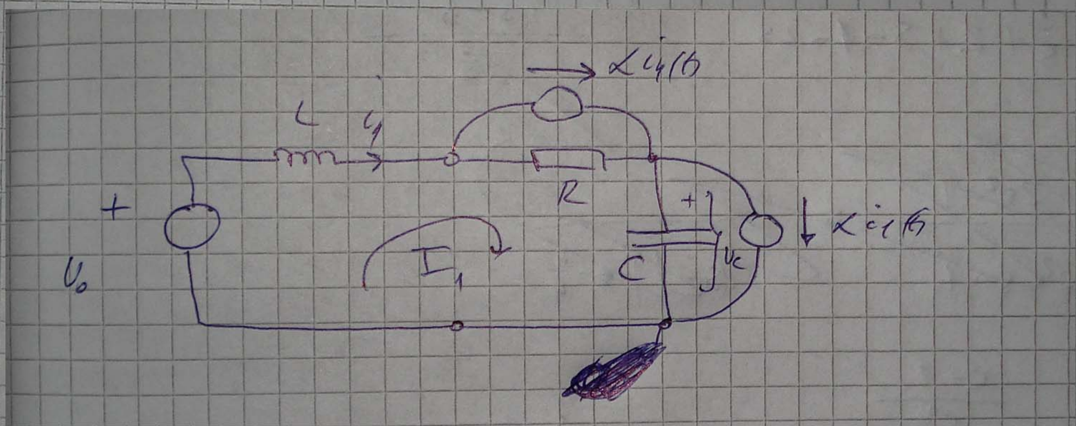
OSTATAK ISTI KAO U 8. ZADATKU !

$$i_1 \left(\frac{1 + sC2 + s^2LC - \alpha 2sC - \alpha}{\cancel{sC}} \right) = \frac{u_0(t)s - u_c(0)}{\cancel{s}}$$

$$i_1 \left(1 + 2s + s^2 - s - \frac{1}{2} \right) = 1 - \frac{1}{2}$$

$$i_1 \left(s^2 + s + \frac{1}{2} \right) = \frac{1}{2}$$

$$i_1 = \frac{\frac{1}{2}}{s^2 + s + \frac{1}{2}} = \frac{\frac{1}{2}}{(s+\frac{1}{2})^2 + (\frac{1}{2})^2} = e^{-\frac{1}{2}t} \sin \frac{1}{2}t$$



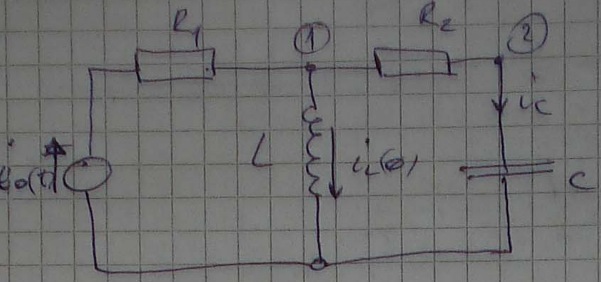
transformirajte strujni krug kako je gore nacrtano, ako vam nije jasno zasto je tako pogledajte slajdove 004 str. 30

sada postoji samo jedna jedn. petlje:

(1) I1(sL + R + 1/sC)=u0(t) + alfa*i1(R + 1/sC) - uc(0)/s

kada se to sredi dobije se ono sto pise na vrhu stranice, i daljnjim sredivanje ispada ispravno rjesenje

(12)



$$(1)\quad U_1\left(\frac{1}{R_1}+\frac{1}{sL}+\frac{1}{R_2}\right)-U_2\frac{1}{R_2}=i_0(t)-\frac{i_L(0)}{s}$$

$$(2)\quad -U_1\frac{1}{R_2}+U_2\left(\frac{1}{R_2}+sC\right)=\emptyset$$

$$(2)\quad U_1=\frac{\frac{1}{R_2}+sC}{\frac{1}{R_2}}U_2$$

$$(2)\to(1)\; U_2\left(1+sCR_2\right)\left(\frac{1}{R_1}+\frac{1}{sL}+\frac{1}{R_2}\right)-U_2\frac{1}{R_1}=i_0(t)-\frac{i_L(0)}{s}$$

$$U_2\left(\left(1+sCR_2\right)\left(\frac{1}{R_1}+\frac{1}{sL}+\frac{1}{R_2}\right)-\frac{1}{R_1}\right)=i_0(t)-\frac{i_L(0)}{s}$$

$$U_2\left[\left(1+s\right)\left(1+\frac{1}{s}+1\right)-1\right]=1-\frac{1}{s}$$

$$U_2\left[\left(1+s\right)\left(2+\frac{1}{s}\right)-1\right]=\frac{s-1}{s}$$

$$U_2\left[2+\frac{1}{s}+2s+1-1\right]=\frac{s-1}{s}$$

$$U_2\left(\frac{2s+1+2s^2}{\cancel{s}}\right)=\frac{s-1}{\cancel{s}}$$

$$U_2=\frac{s-1}{2s^2+2s+1}$$

$$I_C(s) = \frac{U_C(s)}{\frac{1}{sC}} = U_C(s)\cdot sC$$

$$= \frac{1}{2}\,\frac{s^2-s}{s^2+s+\frac{1}{2}} = \frac{1}{2}\left[1-\frac{2s+\frac{1}{2}}{s^2+s+\frac{1}{2}}\right]$$

$$= \frac{1}{2}\left[1-2\left(\frac{s+\frac{1}{4}}{s^2+s+\frac{1}{2}}\right)\right]$$

$$= \frac{1}{2}\left[1-2\left(\frac{s+\frac{1}{2}}{(s+\frac{1}{2})^2+(\frac{1}{2})^2} - \frac{1}{2}\,\frac{\frac{1}{2}}{(s+\frac{1}{2})^2+(\frac{1}{2})^2}\right)\right]$$

$$i_C(t) = \frac{1}{2}\left[\delta(t) - 2\sin\left(\tfrac{1}{2}t\right)e^{-\frac{1}{2}t} + \cos\left(\tfrac{1}{2}t\right)e^{-\frac{1}{2}t}\right]S(t)$$

cini mi se da im jedan podatak krivo zadan ili su dali krivo rjesenje. provjerio sam 10 puta i nisam nasao gresku, a nikako dobit ono njihovo.

ako neko nade gresku neka posta