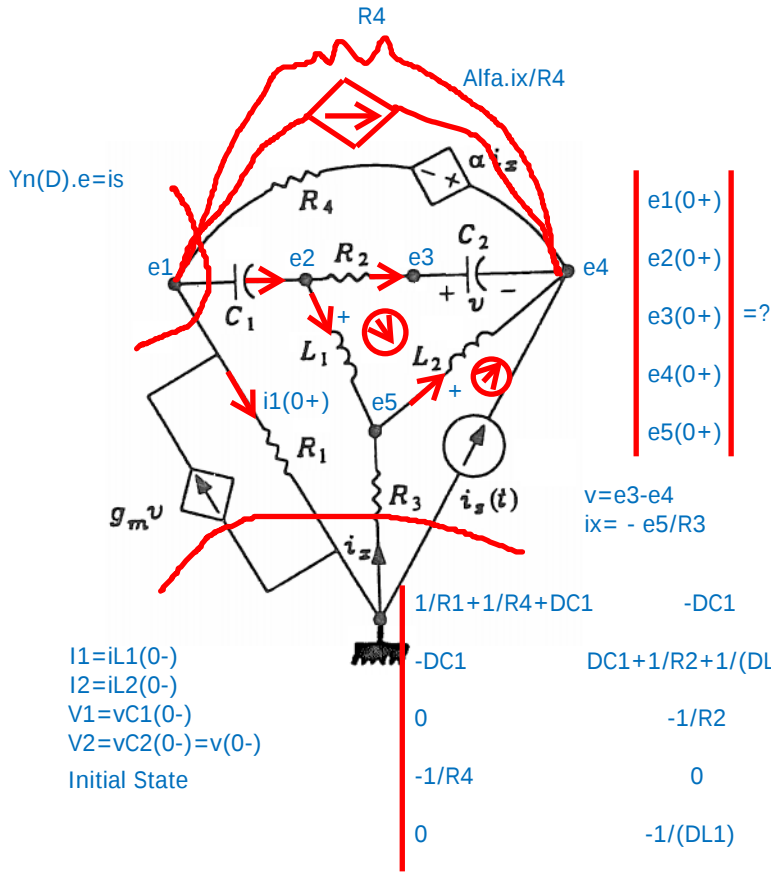


حل مسأله



انتگرال-دیفرانسیل (۳۶ فصل ۱۰) Initial Value

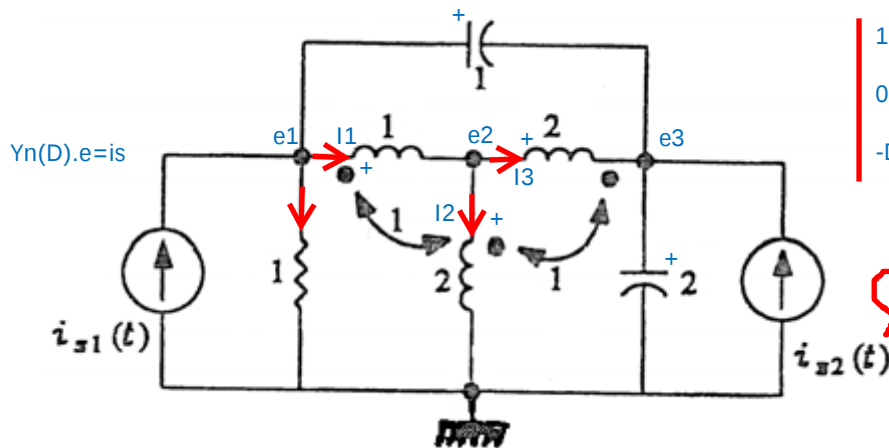
$$\begin{cases} v(0+) = e_3(0+) - e_4(0+) = V_2 \\ e_1(0+) - e_2(0+) = V_1 \\ e_5(0+) = -R_3 \{ i_{L2}(0+) - i_{L1}(0+) \} = -R_3(I_2 - I_1) \\ i_1(0+) = g_m \cdot v(0+) + i_x(0+) + i_s(0+) \\ i_1(0+) = g_m \cdot V_2 + \{ I_2 - I_1 \} + i_s(0+) \\ e_1(0+) = R_1 \cdot i_1(0+) = R_1 \cdot [g_m \cdot V_2 + \{ I_2 - I_1 \} + i_s(0+)] \end{cases}$$

$1/R_1 + 1/R_4 + DC_1$	$-DC_1$	0	$-1/R_4$	0	e_1
$-DC_1$	$DC_1 + 1/R_2 + 1/(DL_1)$	$-1/R_2$	0	$-1/(DL_1)$	e_2
0	$-1/R_2$	$1/R_2 + DC_2$	$-DC_2$	0	e_3
$-1/R_4$	0	$-DC_2$	$1/R_4 + DC_2 + 1/(DL_2)$	$-1/(DL_2)$	e_4
0	$-1/(DL_1)$	0	$-1/(DL_2)$	$1/R_3 + 1/(DL_1) + 1/(DL_2)$	e_5

$$\begin{cases} g_m \cdot v - \text{Alfa.}i_x/R_4 \\ -I_1 \\ 0 \\ \text{Alfa.}i_x/R_4 + i_s + I_2 \\ I_1 - I_2 \end{cases} = \begin{cases} g_m \cdot (e_3 - e_4) + \text{Alfa.}e_5/(R_3 R_4) \\ -I_1 \\ 0 \\ -\text{Alfa.}e_5/(R_3 R_4) + i_s + I_2 \\ I_1 - I_2 \end{cases}$$

$1/R_1 + 1/R_4 + DC_1$	$-DC_1$	$-g_m$	$g_m - 1/R_4$	$-\text{Alfa.}/(R_3 R_4)$	e_1	0
$-DC_1$	$DC_1 + 1/R_2 + 1/(DL_1)$	$-1/R_2$	0	$-1/(DL_1)$	e_2	$-I_1$
0	$-1/R_2$	$1/R_2 + DC_2$	$-DC_2$	0	e_3	0
$-1/R_4$	0	$-DC_2$	$1/R_4 + DC_2 + 1/(DL_2)$	$-1/(DL_2) + \text{Alfa.}/(R_3 R_4)$	e_4	$i_s + I_2$
0	$-1/(DL_1)$	0	$-1/(DL_2)$	$1/R_3 + 1/(DL_1) + 1/(DL_2)$	e_5	$I_1 - I_2$

انتگرال-دیفرانسیل + تزویج (۳۴ فصل ۱۰)



$$\begin{bmatrix} 1+D & 0 & -D \\ 0 & 0 & 0 \\ -D & 0 & D+2D \end{bmatrix} \begin{bmatrix} e1 \\ e2 \\ e3 \end{bmatrix} = \begin{bmatrix} is1-iL1 \\ iL1-iL2-iL3 \\ iL3+is2 \end{bmatrix}$$

$$iL = iL(0-) + (1/L) \text{Integral}\{vL.dt\}$$

$$iL = iL(0-) + (1/D) \cdot \underline{\underline{\text{gamma} \cdot vL}}$$

$$\begin{bmatrix} iL1(t) \\ iL2(t) \\ iL3(t) \end{bmatrix} = \begin{bmatrix} iL1(0-) \\ iL2(0-) \\ iL3(0-) \end{bmatrix} + (1/D) \int^{-1} \begin{bmatrix} vL1(t) \\ vL2(t) \\ vL3(t) \end{bmatrix} dt$$

gamma

$$\begin{bmatrix} vL1(t) \\ vL2(t) \\ vL3(t) \end{bmatrix} = \begin{bmatrix} e1-e2 \\ e2 \\ e2-e3 \end{bmatrix}$$

$$L = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix} \xrightarrow{\text{inverse}} \text{gamma}$$

$$\begin{matrix} i1 \\ i2 \\ i3 \\ v1 \\ v2 \end{matrix} \quad \left. \begin{matrix} e1(0+)-e3(0+)=V1 \\ e3(0+)=V2 \end{matrix} \right\} \Rightarrow \begin{matrix} e1(0+)=e3(0+)+V1 \\ e3(0+)=V2 \\ e2(0+)=? \end{matrix}$$