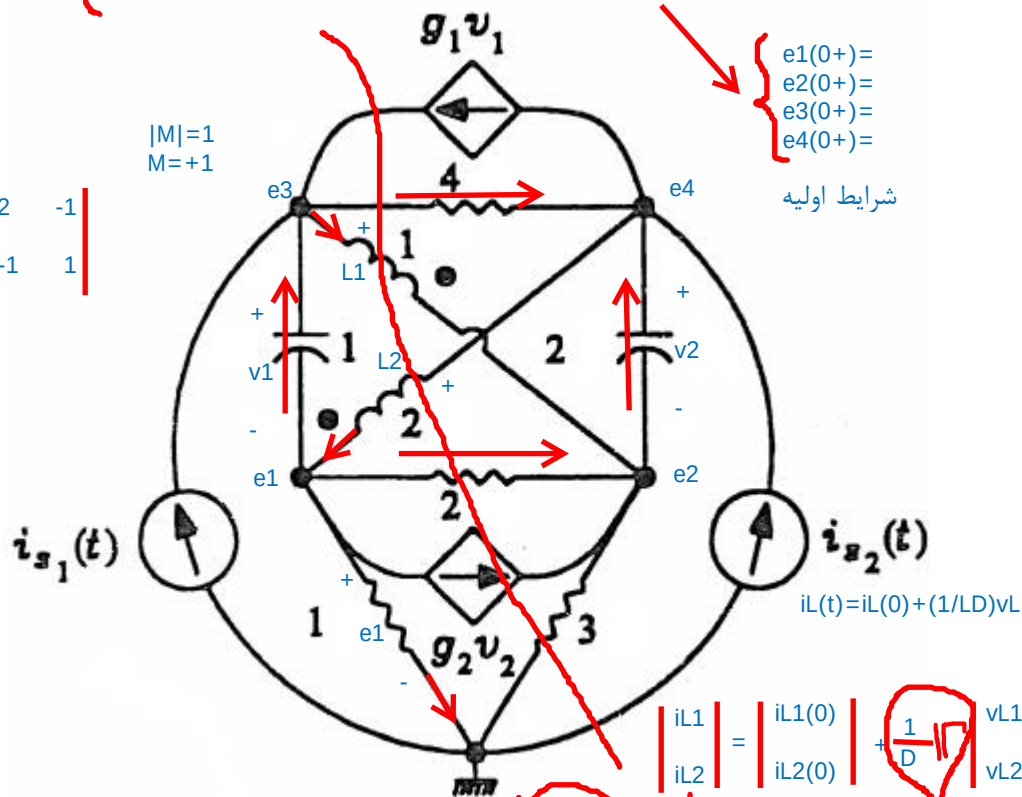


$$\begin{cases} v_1(0+) \\ v_2(0+) \\ i_{L1}(0+) \\ i_{L2}(0+) \end{cases}$$

حالت اولیه
(داده شده)

$$\begin{cases} e_3(0+)-e_1(0+)=v_1(0+) \\ e_4(0+)-e_2(0+)=v_2(0+) \\ e_1(0+)/1+e_2(0+)/3=i_{s1}(0+)+i_{s2}(0+) \quad (\text{KCL @GND}) \\ g_1.v_1(0+)+i_{L2}(0+)+e_2(0+)/3=\{e_3(0+)-e_4(0+)\}/4+i_{L1}(0+)+\{e_1(0+)-e_2(0+)\}/2+g_2.v_2(0+) \quad (\text{KCL @Cutset}) \end{cases}$$

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



$$\begin{aligned} i_{s1} &= i_{s1}(t) \\ e_1 &= e_1(t) \end{aligned}$$

$$\begin{cases} e_1(0+) = \\ e_2(0+) = \\ e_3(0+) = \\ e_4(0+) = \end{cases}$$

شرایط اولیه

$$i_L(t) = i_L(0+) + (1/LD)v_L$$

$$\begin{bmatrix} 1+1/2+D & -1/2 & -D & 0 \\ -1/2 & 1/2+1/3+2D & 0 & -2D \\ -D & 0 & D+1/4 & -1/4 \\ 0 & -2D & -1/4 & 1/4+2D \end{bmatrix} \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ e_4 \end{bmatrix} = \begin{bmatrix} i_{L2}-g_2.v_2 \\ i_{L1}+g_2.v_2 \\ i_{s1}-i_{L1}+g_1.v_1 \\ i_{s2}-g_1.v_1-i_{L2} \end{bmatrix}$$

$$Y_n(D).e = i_s$$

$$\begin{bmatrix} i_{L1} \\ i_{L2} \end{bmatrix} = \begin{bmatrix} i_{L1}(0) \\ i_{L2}(0) \end{bmatrix} + \frac{1}{D} \begin{bmatrix} v_{L1} \\ v_{L2} \end{bmatrix}$$

$v_{L1} = e_3 - e_2$
 $v_{L2} = e_4 - e_1$

$$\gamma/D = \begin{bmatrix} 2/D & -1/D \\ -1/D & 1/D \end{bmatrix}$$

$$\begin{aligned} v_1 &= e_3 - e_1 \\ v_2 &= e_4 - e_2 \end{aligned}$$