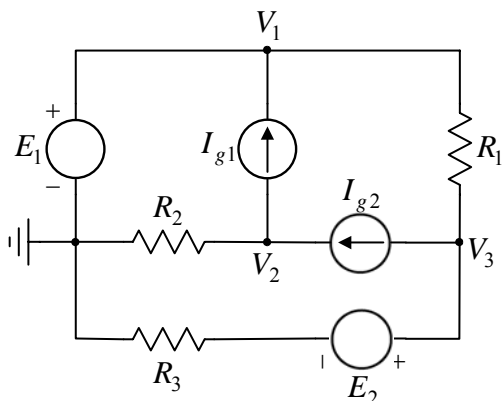


Osnovi elektronike SI

Rešenja zadataka – septembar 2008.

I deo

2. zadatak



a) $V_1 = 3 \text{ V}; V_2 = 4 \text{ V}; V_3 = 6 \text{ V}$

b) $P_{R2} = 8 \text{ W}; P_{I_{g2}} = -8 \text{ W}; P_{E2} = 80 \text{ W}$

II deo

2. zadatak

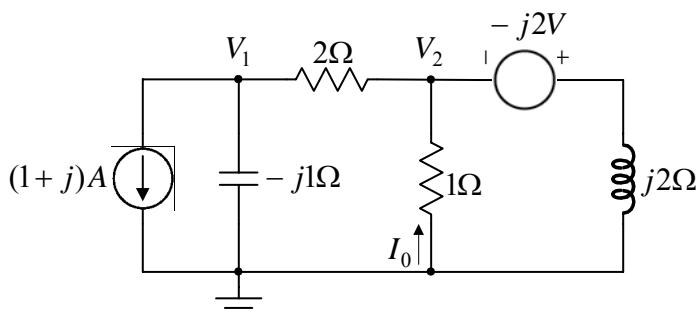
$$v(t) = 2\sqrt{2}V \cdot \sin(2\pi ft) = 2\sqrt{2}V \cdot \cos(2\pi ft - 90^\circ) \Rightarrow \underline{V} = 2 \cdot e^{-j90^\circ} V = -j2V$$

$$i(t) = 2A \cdot \cos(2\pi ft + 45^\circ) \Rightarrow \underline{I} = \sqrt{2} \cdot e^{j45^\circ} A = (1 + j)A$$

$$\underline{Z}_L = j2\pi fL = j2\Omega$$

$$\underline{Z}_C = -\frac{j}{2\pi fC} = -j1\Omega$$

Ukoliko se čvorovi u kolu označe na način kao što je to prikazano na slici:



sistem jednačina po metodi potencijala čvorova ima sledeći izgled:

$$\left(\frac{1}{-j} + \frac{1}{2}\right) \cdot \underline{V}_1 - \frac{1}{2} \cdot \underline{V}_2 = -1 - j$$

$$-\frac{1}{2} \cdot \underline{V}_1 + \left(\frac{1}{2} + \frac{1}{1} + \frac{1}{2j}\right) \cdot \underline{V}_2 = -\frac{-2j}{2j}$$

Rešenje ovog sistema je: $\underline{V}_1 = \left(-\frac{44}{41} + j\frac{14}{41}\right)V$ i $\underline{V}_2 = \left(\frac{10}{41} + j\frac{8}{41}\right)V$.

Dalje sledi: $\underline{I}_0 = -\frac{\underline{V}_2}{1\Omega} = \left(-\frac{10}{41} - j\frac{8}{41}\right)A = 0,312 \cdot e^{j218,66^\circ} A$,

ili u vremenskom domenu: $i_0(t) = 0,44A \cdot \cos(2\pi ft + 218,66^\circ)$.

III deo

2. zadatak

$$v_G = \frac{R_1 R_3 R_5}{R_2 R_4} i_G$$