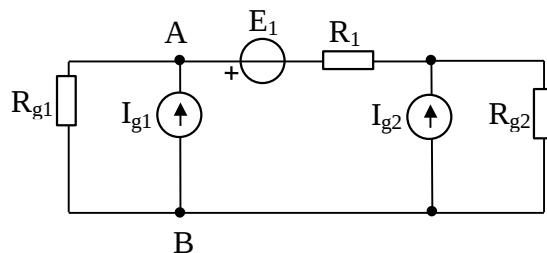


Priprema za kolokvijume, A

1. U kolu prikazanom na slici odrediti:

- a) otpornost mreže između tačaka A i B,
- b) jačine struja u svim granama,
- c) snage svih generatora,

Brojni podaci: $E_1 = 12\text{V}$, $R_1 = R_2 = 10\Omega$, $R_{g1} = R_{g2} = 100\Omega$,
 $I_{g1} = I_{g2} = 0,5\text{A}$.

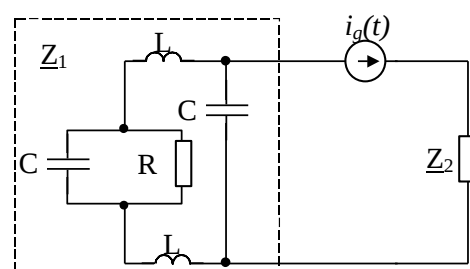


2. U kolu prikazanom na slici odrediti:

- a) ekvivalentnu impedansu $\underline{Z}_1$,
- b) trenutnu vrednost napona na priključcima strujnog generatora $i_g(t)$,
- c) kompleksnu snagu impedanse $\underline{Z}_1$.

Poznato je: $i_g(t) = 1\cos(1000t - \pi/4)\text{A}$, $R = 40\Omega$, $L = 20\text{mH}$, $C = 50\mu\text{F}$,

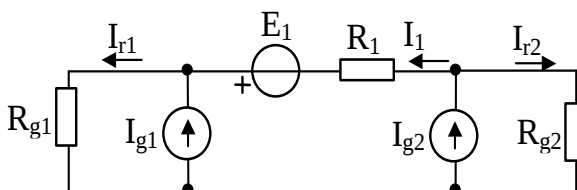
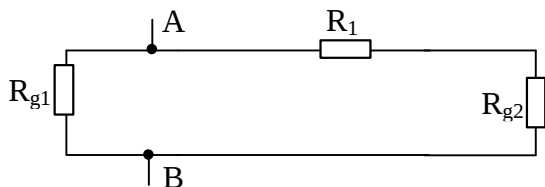
$\underline{Z}_2 = -j20\Omega$.



Drugi deo kolokvijuma

Priprema za kolokvijume, A

1. Brojni podaci: $E_1 = 12\text{V}$, $R_1 = 1\Omega$, $R_{g1} = R_{g2} = 10\text{k}\Omega$, $I_{g1} = I_{g2} = 5\text{mA}$.



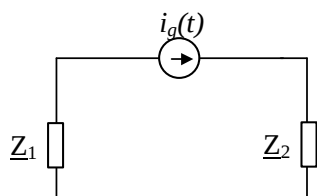
a) $R_{AB} = (R_1 + R_{g2}) \parallel R_{g1} \cong 5\text{k}\Omega$

c) $P_{E1} = E_1 I_1 = 7,2\text{mW}$
 $P_{I_{g1}} = U_{g1} I_{g1} = R_{g1} I_{r1} I_{g1} = 280\text{mW}$
 $P_{I_{g2}} = U_{g2} I_{g2} = R_{g2} I_{r2} I_{g2} = 220\text{mW}$

b) $-I_{g1} - I_1 + I_{r1} = 0$
 $-I_{g2} + I_1 + I_{r2} = 0$
 $I_{r1} R_{g1} - I_{r2} R_{g2} + I_1 R_1 - E_1 = 0$

$I_1 = 0,6\text{mA}, \quad I_{r1} = 5,6\text{mA}, \quad I_{r2} = 4,4\text{mA}$

2. Poznato je: $i_g(t) = 1\cos(1000t - \pi/4)\text{A}$, $R = 40\Omega$, $L = 20\text{mH}$, $C = 50\mu\text{F}$, $\underline{Z}_2 = -j20\Omega$.



$\underline{Z}_L = j20\Omega, \quad \underline{Z}_R = 40\Omega, \quad \underline{Z}_C = -j20\Omega$

$\underline{I}_g = 1/\sqrt{2} e^{-j45^\circ} \text{A} = (0,5 - j0,5\text{A})$

$\underline{Z}_1 = (\underline{Z}_R \parallel \underline{Z}_C + 2\underline{Z}_L) \parallel \underline{Z}_C$
 $\underline{Z}_1 = (40 - j40)\Omega$

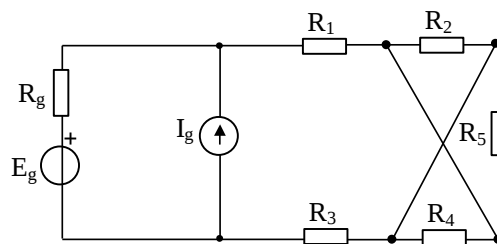
$\underline{U}_{g1} = \underline{I}_g (\underline{Z}_1 + \underline{Z}_2) = (0,5 - j0,5\text{A}) (40 - j60) = (-10 - j50)\text{V}$
 $u_{g1}(t) = 51\sqrt{2}\cos(1000t - 101^\circ)\text{V}$

Priprema za kolokvijume, B

1. U kolu prikazanom na slici odrediti:

- ekvivalentnu otpornost otpornika kojim se može zameniti grupa otpornika R_1, R_2, R_3, R_4, R_5
- jačinu električne struje kroz generator ems E_g ,
- snagu strujnog generatora,
- snagu koja se razvija na otporniku otpornosti R_g .

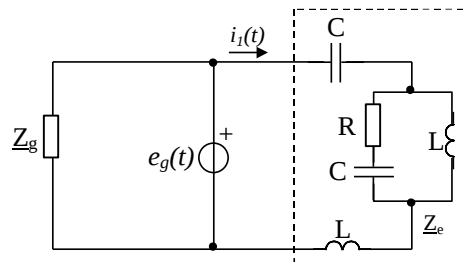
Brojni podaci: $E_g=20V$, $R_1=R_2=R_3=R_4=R_5=30\Omega$, $R_g=10\Omega$, $I_g=2A$.



2. U kolu na slici odrediti:

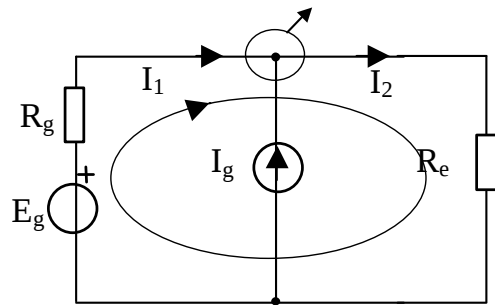
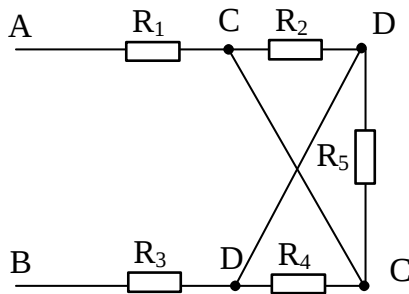
- Ekvivalentnu impedansu $\underline{Z}_e$,
- Trenutnu vrednost jačine struje $i_1(t)$,
- Kompleksnu snagu koju se razvija na impedansi $\underline{Z}_g$.

Poznato je: $e_g(t) = 20 \cos(1000t + \pi/4)V$, $R=40\Omega$, $L=40mH$, $C=25\mu F$, $\underline{Z}_g = (40+j40)\Omega$.



Priprema za kolokvijume, B

1. Brojni podaci: $E_g=20V$, $R_1=R_2=R_3=R_4=R_5=30\Omega$, $R_g=10\Omega$, $I_g=2A$.



a) $R_e = R_1 + (R_2 \parallel R_4 \parallel R_5) + R = 70\Omega$

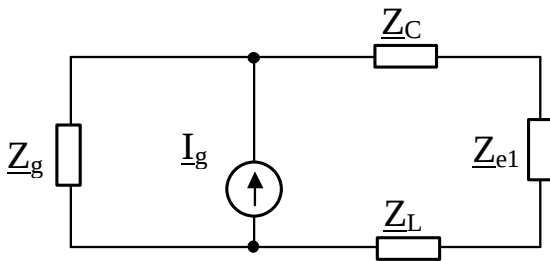
c) $U_e = I_2 R_e = 35V$
 $P_{I_g} = I_g U_e = 70W$

b) $I_2 - I_g - I_1 = 0$
 $I_2 R_e - E_g + I_1 R_g = 0$

$I_1 = -1,5A, \quad I_2 = 0,5A$

d) $P_{R_g} = R_g I_1^2 = 22,5W$

1. Poznato je: $i_g(t) = 2 \cos(1000t + \pi/4) A$, $R=40\Omega$, $L=40mH$, $C=25\mu F$, $\underline{Z}_g = (40+j40)\Omega$.



$\underline{Z}_L = j40\Omega, \quad \underline{Z}_R = 40\Omega, \quad \underline{Z}_C = -j40\Omega$

$\underline{I}_g = \sqrt{2} e^{j45^\circ} A = (1+j1)A$

a) $\underline{Z}_{e1} = (\underline{Z}_R + \underline{Z}_C) \parallel \underline{Z}_L = (40 + j40)\Omega$
 $\underline{Z}_e = (\underline{Z}_C + \underline{Z}_{e1} + \underline{Z}_L) = (40 + j40)\Omega$

b) $-\underline{I}_g + \underline{I}_1 + \underline{I}_2 = 0$
 $\underline{I}_2 \underline{Z}_g - \underline{I}_1 \underline{Z}_e = 0$

$\underline{I}_2 = \underline{I}_1 = (0,5 + j0,5)A$
 $i_L(t) = 1 \cos(1000t + \pi/4) A$

c) $\underline{S}_{Z_g} = \underline{Z}_g |\underline{I}_2|^2 = (40+j40) 0,5$
 $= (20+j20)VA$

