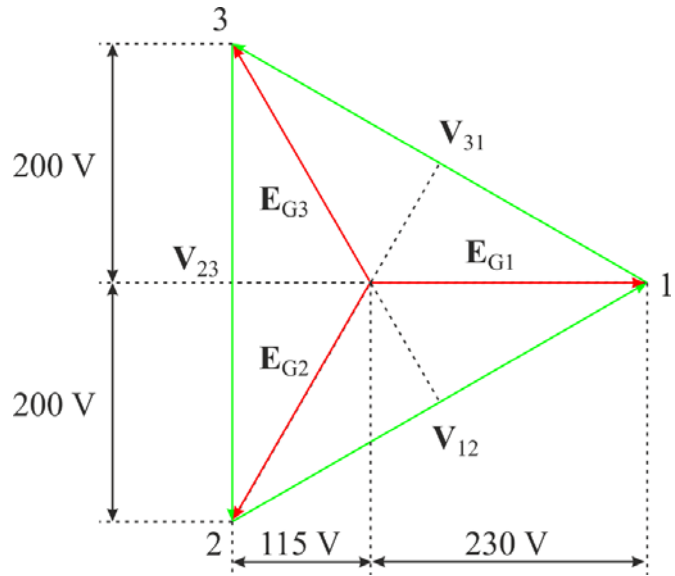


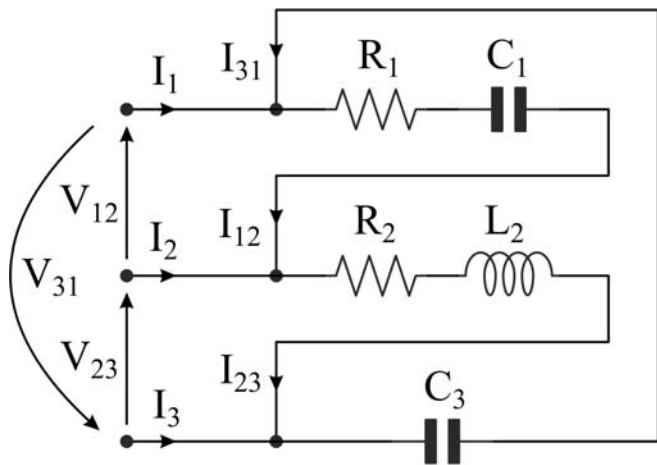
$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$



$$\mathbf{V}_{12} = 345 + 200j \text{ V} \quad \mathbf{V}_{23} = -400j \text{ V} \quad \mathbf{V}_{31} = -345 + 200j \text{ V}$$

$$\mathbf{E}_{G1} = 230 \text{ V} \quad \mathbf{E}_{G2} = -115 - 200j \text{ V} \quad \mathbf{E}_{G3} = -115 + 200j \text{ V}$$



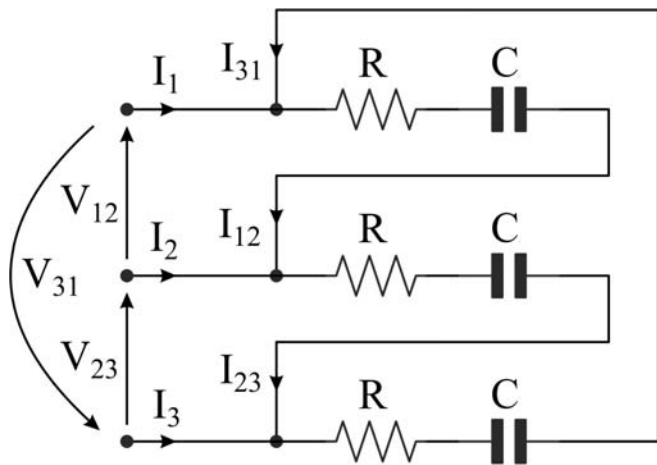
$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R_1 = 50 \Omega \quad 1/(\omega C_1) = 150 \Omega$$

$$R_2 = 100 \Omega \quad \omega L_2 = 100 \Omega$$

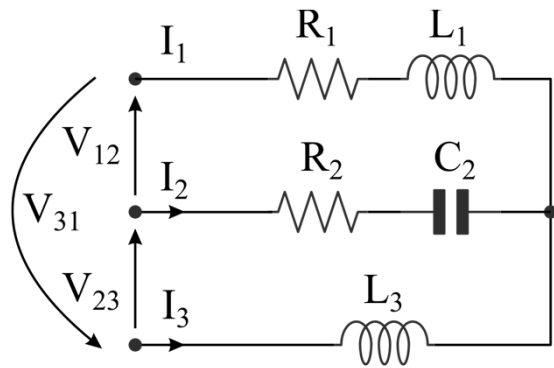
$$1/(\omega C_3) = 100 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R = 40 \text{ } \Omega \quad 1/(\omega C) = 69 \text{ } \Omega$$



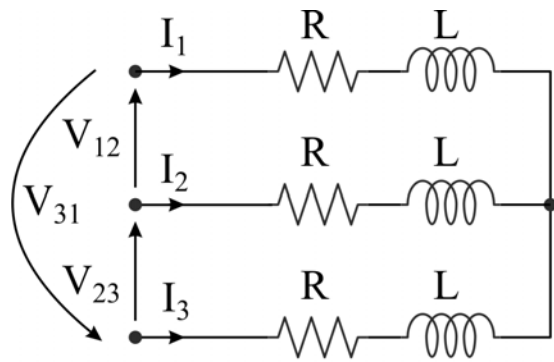
$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R_1 = 150 \Omega \quad \omega L_1 = 150 \Omega$$

$$R_2 = 100 \Omega \quad 1/(\omega C_2) = 100 \Omega$$

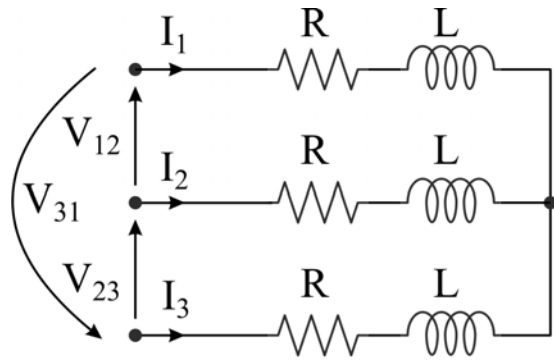
$$\omega L_3 = 100 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

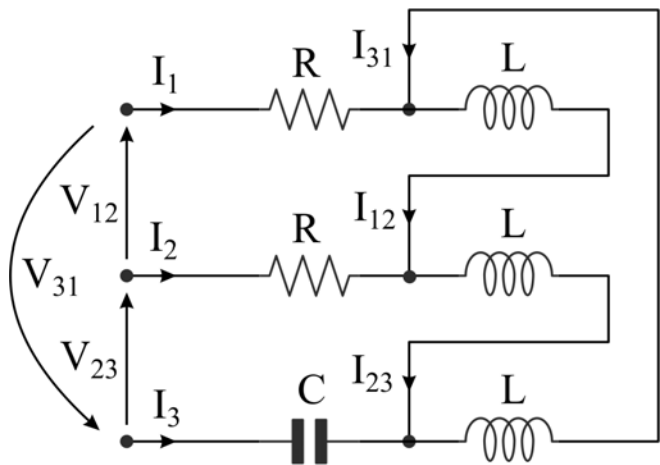
$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R = 23 \Omega \quad \omega L = 69 \Omega$$



$$\mathbf{V}_{12} = 150 \text{ V} \quad \mathbf{V}_{23} = -150j \text{ V} \quad \mathbf{V}_{31} = -150 + 150j \text{ V}$$

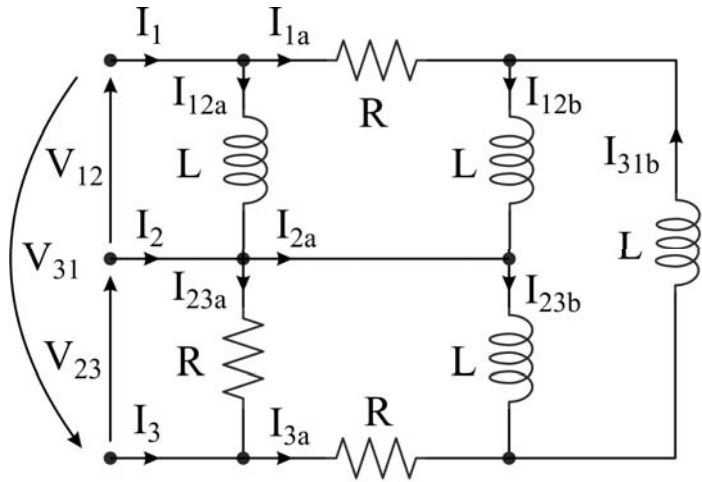
$$R = 10 \Omega \quad \omega L = 5 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

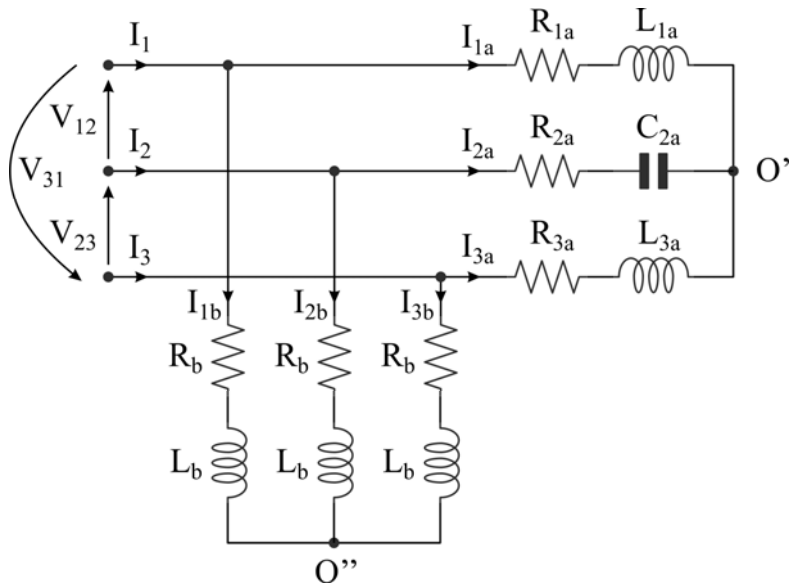
$$R = 5 \Omega \quad \omega L = 30 \Omega \quad 1/(\omega C) = 20 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R = 10 \Omega \quad \omega L = 30 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

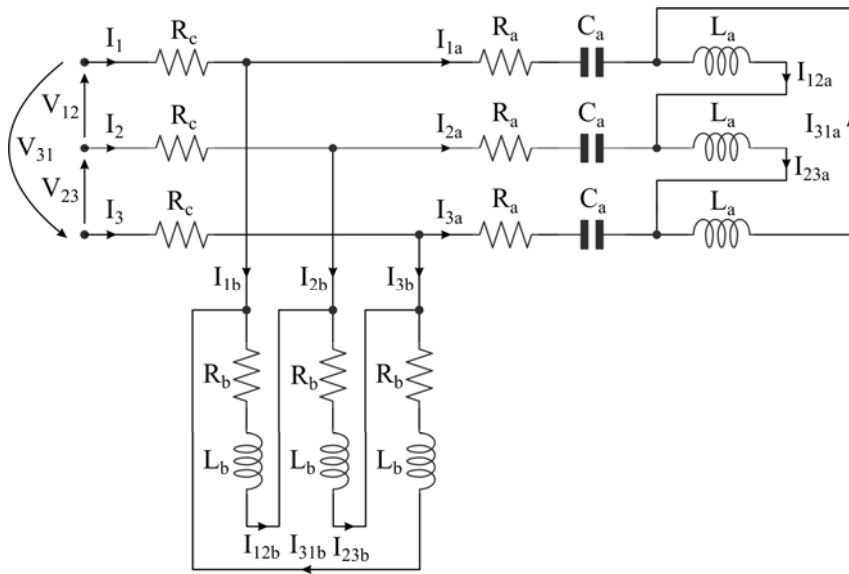
$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R_{1a} = 50 \text{ } \Omega \quad \omega L_{1a} = 50 \text{ } \Omega$$

$$R_{2a} = 100 \text{ } \Omega \quad 1/(\omega C_{2a}) = 100 \text{ } \Omega$$

$$R_{3a} = 100 \text{ } \Omega \quad \omega L_{3a} = 100 \text{ } \Omega$$

$$R_b = 50 \text{ } \Omega \quad \omega L_b = 100 \text{ } \Omega$$

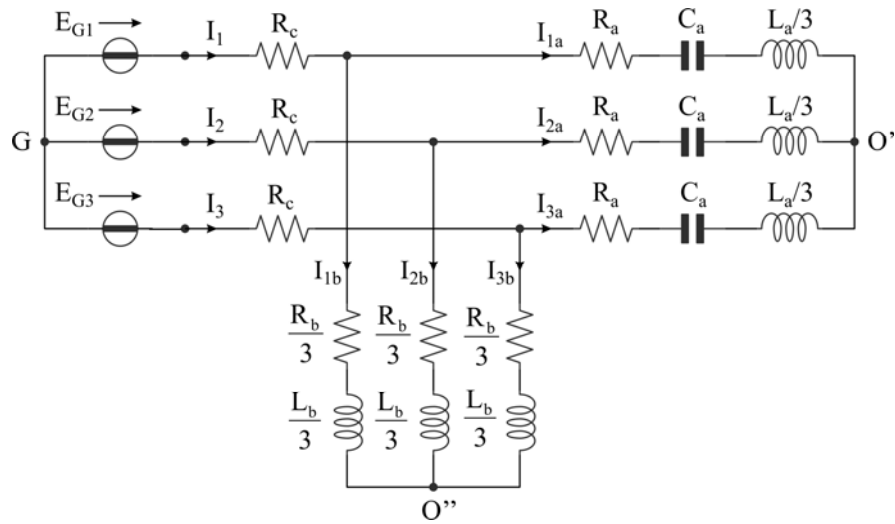


$$R_a = 50 \, \Omega \quad 1/(\omega C_a) = 30 \, \Omega \quad \omega L_a = 45 \, \Omega$$

$$R_b = 45 \, \Omega \quad \omega L_b = 15 \, \Omega$$

$$R_c = 5 \, \Omega$$

$$V_{\text{eff}} = 520 \, \text{V} \quad E_{\text{eff}} \cong 300 \, \text{V}$$

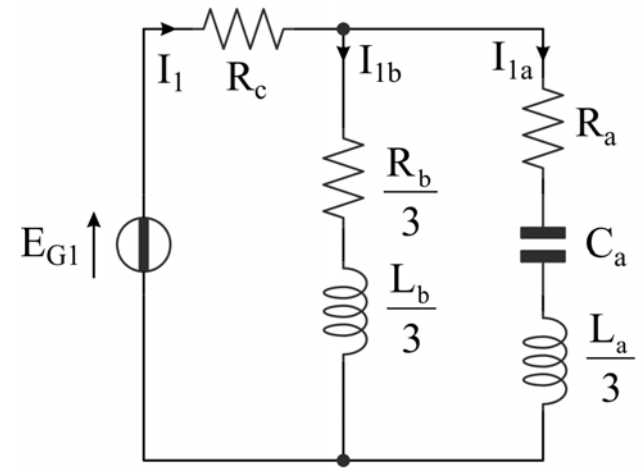
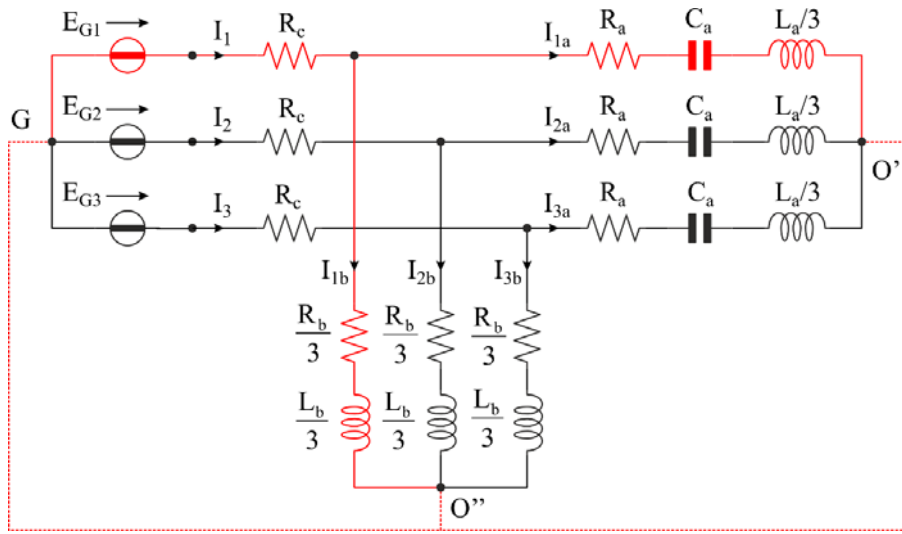


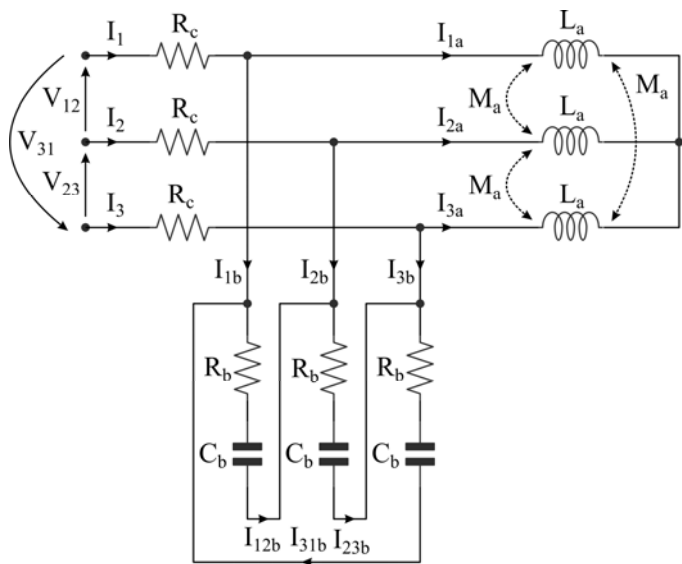
$$R_a = 50 \, \Omega \quad 1/(\omega C_a) = 30 \, \Omega \quad \omega L_a = 45 \, \Omega$$

$$R_b = 45 \, \Omega \quad \omega L_b = 15 \, \Omega$$

$$R_c = 5 \, \Omega$$

$$V_{\text{eff}} = 520 \, \text{V} \quad E_{\text{eff}} \cong 300 \, \text{V}$$





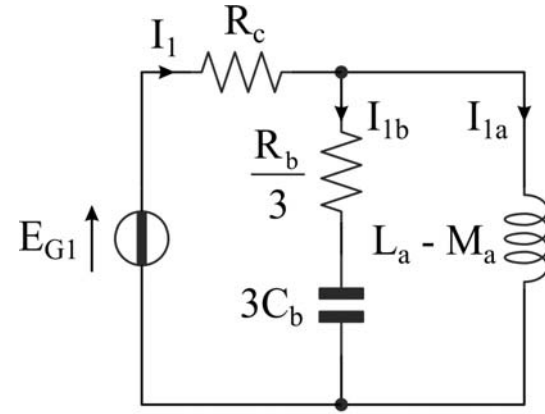
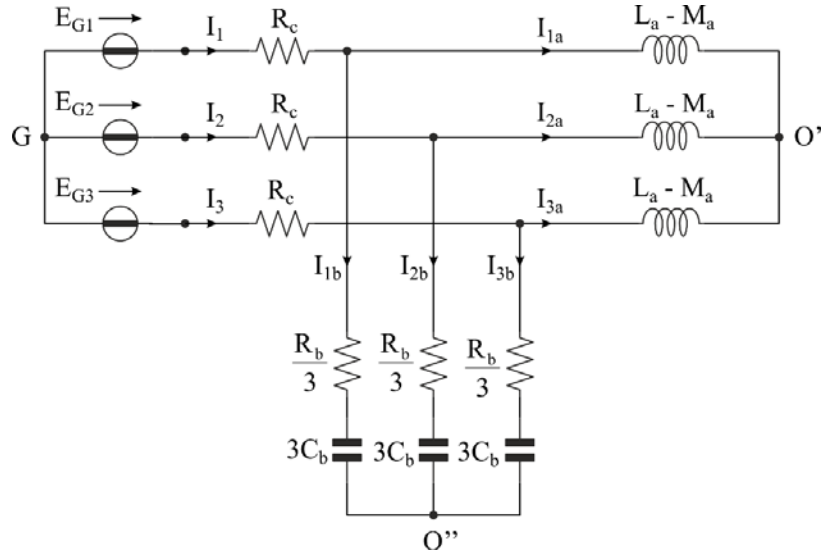
$$\mathbf{V}_{12} = 345 + 200j \text{ V} \quad \mathbf{V}_{23} = -400j \text{ V} \quad \mathbf{V}_{31} = -345 + 200j \text{ V}$$

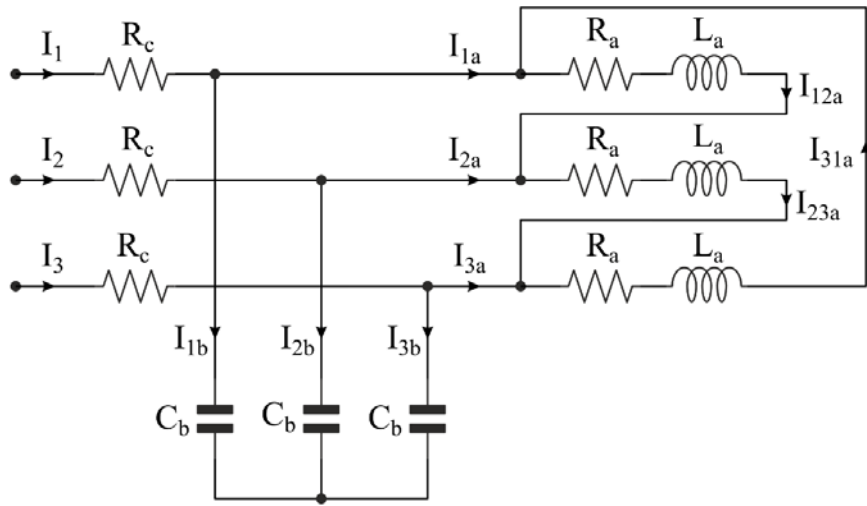
$$\mathbf{E}_{G1} = 230 \text{ V} \quad \mathbf{E}_{G2} = -115 - 200j \text{ V} \quad \mathbf{E}_{G3} = -115 + 200j \text{ V}$$

$$\omega L_a = 10 \text{ } \Omega \quad \omega M_a = 5 \text{ } \Omega$$

$$R_b = 15 \text{ } \Omega \quad 1/(\omega C_b) = 15 \text{ } \Omega$$

$$R_c = 5 \text{ } \Omega$$



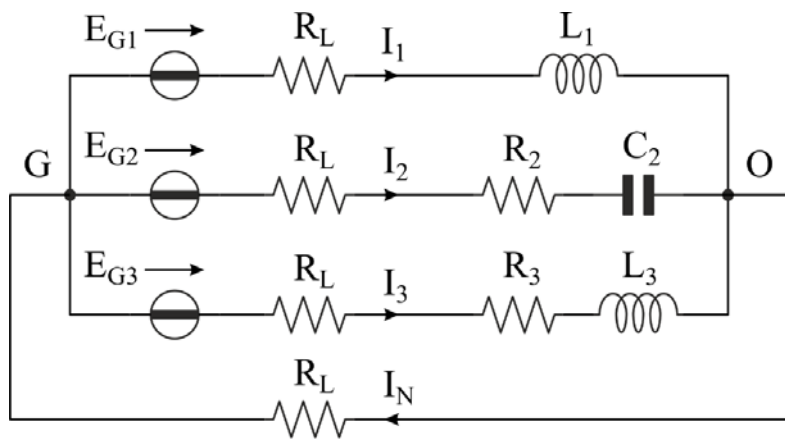


$$E_G = 1200 \text{ V}$$

$$R_a = 30 \Omega \quad \omega L_a = 15 \Omega$$

$$1/(\omega C_b) = 10 \Omega$$

$$R_c = 10 \Omega$$



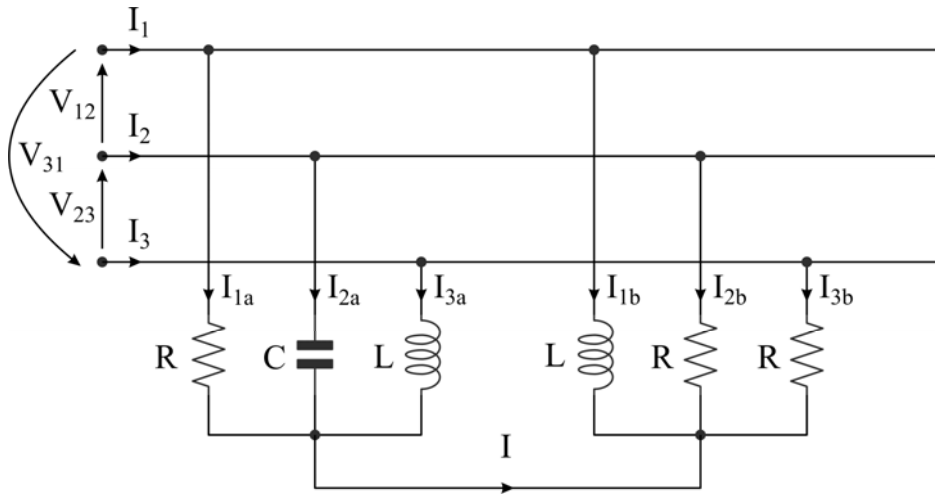
$$\mathbf{E}_{G1} = 230 \text{ V} \quad \mathbf{E}_{G2} = -115 - 200j \text{ V} \quad \mathbf{E}_{G3} = -115 + 200j \text{ V}$$

$$\omega L_1 = 5 \Omega$$

$$R_2 = 5 \Omega \quad 1/(\omega C_2) = 5 \Omega$$

$$R_3 = 5 \Omega \quad \omega L_3 = 5 \Omega$$

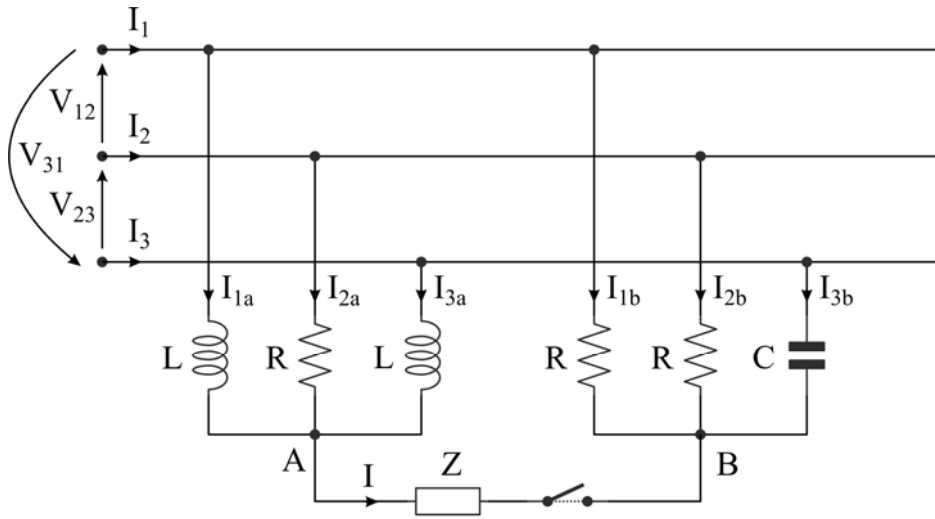
$$R_L = 5 \Omega$$



$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R = 10 \Omega \quad \omega L = 10 \Omega \quad 1/(\omega C) = 5 \Omega$$

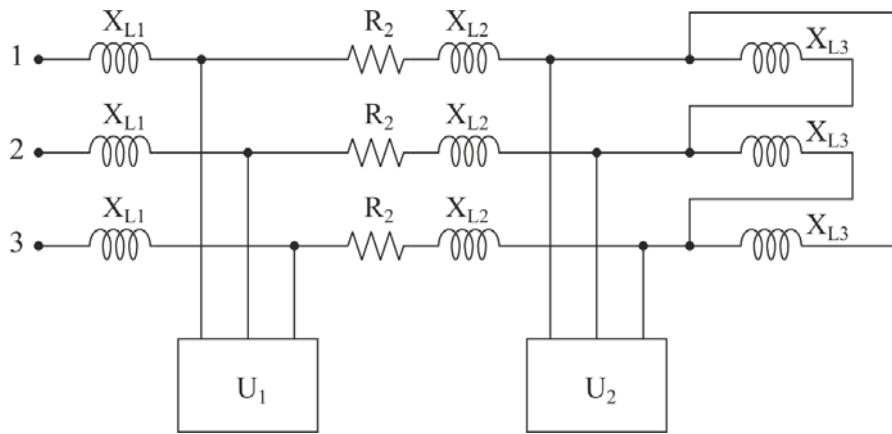


$$\mathbf{V}_{12} = -200 + 345j \text{ V} \quad \mathbf{V}_{23} = 400 \text{ V} \quad \mathbf{V}_{31} = -200 - 345j \text{ V}$$

$$\mathbf{E}_{G1} = 230j \text{ V} \quad \mathbf{E}_{G2} = 200 - 115j \text{ V} \quad \mathbf{E}_{G3} = -200 - 115j \text{ V}$$

$$R = 10 \Omega \quad \omega L = 10 \Omega \quad 1/(\omega C) = 10 \Omega$$

$$\mathbf{Z} = 2 - 6j \Omega$$



A.A. 2014-15 Prova n. 6 (22-7-2015)

$$X_{L1} = 20 \, \Omega$$

$$R_2 = 10 \, \Omega$$

$$X_{L3} = 60 \, \Omega$$

$$P_{U10} = 18 \, \text{kW}$$

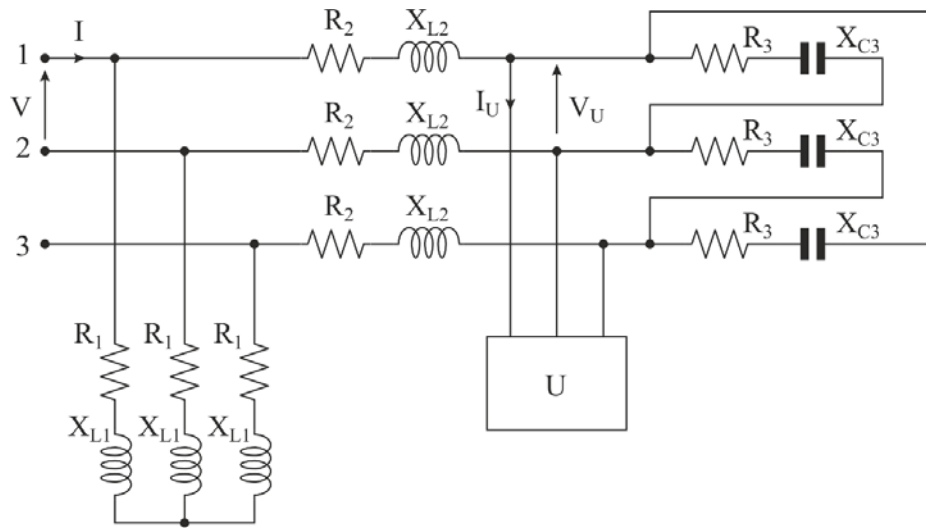
$$P_{U20} = 43.2 \, \text{kW}$$

$$E_G = 600 \, \text{V}$$

$$X_{L2} = 5 \, \Omega$$

$$\cos\varphi_{U1} = \sqrt{2}/2$$

$$\cos\varphi_{U2} = 0.8$$



A.A. 2014-15 Prova n. 7 (3-9-2015)

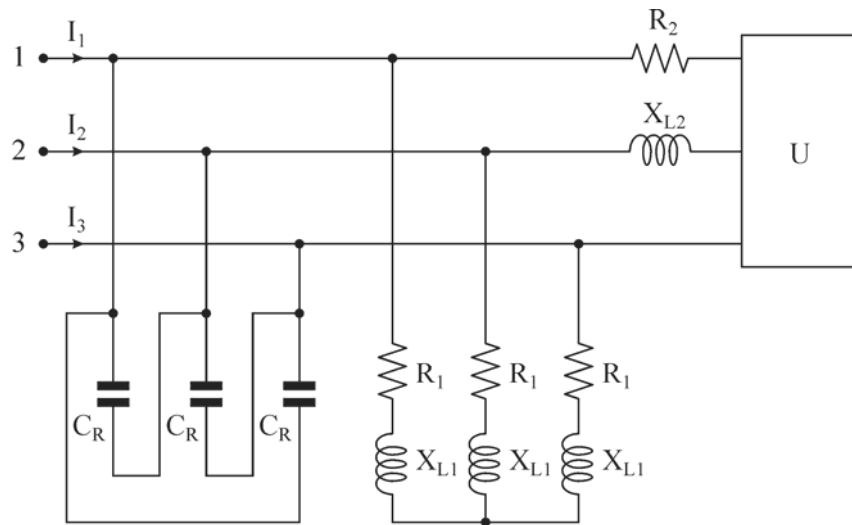
$$R_1 = 30 \, \Omega \quad X_{L1} = 10 \, \Omega$$

$$R_2 = 5 \, \Omega \quad X_{L2} = 25 \, \Omega$$

$$R_3 = 120 \, \Omega \quad X_{C3} = -60 \, \Omega$$

$$P_U = 6 \, \text{kW} \quad \cos\varphi_{Un} = 0.8$$

$$i_U(t) = 5\sqrt{2}\cos(100\pi t) \, \text{A}$$



A.A. 2014-15 Prova n. 8 (17-9-2015)

$$R_1 = 10 \Omega$$

$$X_{L1} = 10 \Omega$$

$$R_2 = 10 \Omega$$

$$X_{L2} = 5 \Omega$$

$$V_{Un} = 500 \text{ V}$$

$$S_{Un} = 10 \text{ kVA}$$

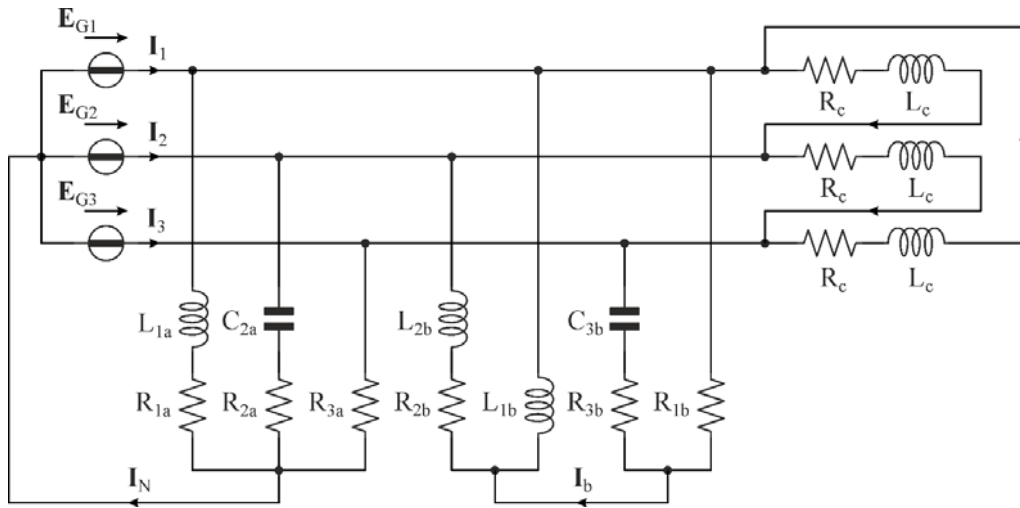
$$\cos\varphi_{Un} = 0.6$$

$$V_e = 400 \text{ V}$$

$$f = 50 \text{ Hz}$$

$$\cos\Phi' = 0.9$$

A.A. 2016-17 Prova n. 5 (5-7-2017)



$$\begin{aligned}
 \mathbf{E}_{G1} &= 230j \text{ V} & \mathbf{E}_{G2} &= 200 - 115j \text{ V} & \mathbf{E}_{G3} &= -200 - 115j \text{ V} \\
 R_{1a} &= 5 \ \Omega & X_{L1a} &= 5 \ \Omega & & \\
 R_{2a} &= 10 \ \Omega & X_{C2a} &= -5 \ \Omega & & \\
 R_{3a} &= 10 \ \Omega & & & & \\
 R_{1b} &= 10 \ \Omega & X_{L1b} &= 10 \ \Omega & & \\
 R_{2b} &= 10 \ \Omega & X_{L2b} &= 5 \ \Omega & & \\
 R_{3b} &= 10 \ \Omega & X_{C3b} &= -5 \ \Omega & & \\
 P_c &= 25.5 \text{ W} & \cos\varphi_c &= 0.8 & &
 \end{aligned}$$