

Exercice 1

$$R_1 = 3 \text{ k}\Omega$$

$$L_2 = 1.97 \text{ mH}$$

$$C_3 = 636.9 \text{ pF}$$

$$\underline{I}_2 = 0.8 \exp(j90^\circ) \text{ mA}$$

$$\underline{I}_3 = 0.62 \exp(-22.5^\circ j) \text{ mA}$$

$$I_1 \approx 0.8 \text{ et que la phase est de } 45^\circ$$

Exercice 2

$$Q = 17.458 \text{ kWh}$$

$$R = 35.267 \Omega$$

$$\Delta t = 11.639 \text{ h}$$

$$R_{\text{new}} = 18.179 \Omega$$

Exercice 3

$$\underline{Z}_{eq} = \underline{Z}_4 + R_1 \approx 8 - 0.22j \approx 8 \exp(-1.58^\circ j)$$

$$\underline{\hat{U}}_S = 24 \exp(45^\circ j)$$

$$\underline{\hat{I}} = 3 \exp(46.58^\circ j) = 2.06 + 2.18j \text{ A}$$

$$P = 35.99 \text{ W}$$

$$Q = -0.99 \text{ var}$$

Exercice 4

$$C_1 = 50 \text{ pF}$$

$$C_2 = 100 \text{ pF}$$

$$R_1 = 5 \text{ M}\Omega$$

$$R_2 = 1.25 \text{ M}\Omega$$

$$C_{eq} = 150 \text{ pF}$$

$$R_{eq} = 1 \text{ M}\Omega$$

Exercise 5

$$\omega_0 = \sqrt{\frac{1}{LC}}$$

$$L = 2.53 \text{ mH.}$$

$$\beta = \frac{R}{L}$$

$$R = 143.07 \, \Omega$$

$$\xi = \frac{1}{2}R\sqrt{\frac{C}{L}}$$

Exercise 6

$$\underline{Z}_0 = 4 + j = 4.123 \exp(14.04^\circ j)$$

$$\underline{\hat{U}} = 4 \exp(90^\circ j)$$

$$\underline{\hat{U}}_0 = 8 \exp(90^\circ j)$$

$$i_{cc}(t) = 1.94 \cos(20000t + 75.96^\circ) \text{ A}$$

Exercise 7

$$q_0 = q \frac{1 + 2\sqrt{2}}{4}$$

$$V = -\frac{1}{\pi\epsilon} \frac{\sqrt{2}}{a} q$$

Exercise 8

Exercise 9

Exercise 10

$$\text{Charge 1 : } \underline{S} = 8000 - 6000j \text{ VA}$$

$$\text{Charge 2 : } \underline{S} = 15000 + 25980j \text{ VA}$$

$$\text{Charge 3 : } \underline{S} = 5000 \text{ VA}$$

Exercise 11

$$\underline{Z}_{th} = 2.11 \exp(-25.5^\circ j) = 1.18 - 13.07j$$

$$\underline{\hat{U}}_0 = 0.43 \exp(-67.5^\circ j)$$