Sèrie 3

Exercici 1

Q1 c **Q2** c **Q3** a **Q4** c **Q5** d

Exercici 2

a) $I = \dfrac{U}{R_1 + R_2} = 3\,\text{A}$

b) $I = \dfrac{U}{R + \dfrac{R_2(R_3 + R_4)}{R_2 + R_3 + R_4}} = 4\,\text{A}$

c) $V_2 = U - R_1 I = 20\,\text{V}$

$V_1 = V_2 \dfrac{R_4}{R_3 + R_4} = 10\,\text{V}$

OPCIÓ A

Exercici 3

a) $\eta = 100\dfrac{P}{U\,I} = 90\,\%$

b) $n = 1000\,\text{min}^{-1} \Rightarrow \omega = 104{,}72\,\dfrac{\text{rad}}{\text{s}}$; $T = \dfrac{P}{\omega} = 5{,}157\,\text{Nm}$

$T = k\,I \Rightarrow k = 0{,}2063\,\dfrac{\text{Nm}}{\text{A}}$; $U = R\,I + k\,\omega \Rightarrow R = 0{,}096\,\Omega$

c) $T' = T/2 \Rightarrow I' = \dfrac{I}{2} = 12{,}5\text{A}$; $\omega' = \dfrac{U - R\,I'}{k} = 110{,}54\,\dfrac{\text{rad}}{\text{s}}$ $\quad \text{n}' = 1056\,\text{min}^{-1}$

Exercici 4

a) $fdp = 1 \Rightarrow \varphi = 0 \Rightarrow X_\text{L} = X_\text{C} \Rightarrow 2\pi fL = \dfrac{1}{2\pi C} \Rightarrow f = 339{,}3\,\text{Hz}$

b) $P = \dfrac{U^2}{R} = 529\,\text{W}$

c) $X_{C50} = \dfrac{1}{2\pi 50 C} = 14{,}47\,\Omega$; $X_L = 2\pi 50 L = 0{,}314\,\Omega$; $Z = \sqrt{R^2 + (X_L - X_C)^2} = 101\,\Omega$;

$I = \dfrac{U}{Z} = 2{,}277\,\text{A}$;

$Q = (X_L - X_C) I^2 = -73{,}4\,\text{VAr}$

OPCIÓ B

Exercici 3

a) $I = \dfrac{U/\sqrt{3}}{\sqrt{R^2 + X^2}} = 21{,}44\,\text{A}$

b) $P = 3 R I^2 = 13790\,\text{W}$

c) $Q = 3 X I^2 = 5516\,\text{VAr}$

d) $S = \sqrt{3}\, U\, I = 14852\,\text{VA}$; $\cos\varphi = \dfrac{P}{S} = 0{,}9285$

Exercici 4

a) $I = \dfrac{P}{U} = 10\,\text{A}$;

b) $\dfrac{5}{100} U = 2 R_{\max} I \Rightarrow R_{\max} = 0{,}575\,\Omega$; $R_{\max} = \rho \dfrac{L}{S_{\min}} \Rightarrow S_{\min} = 1{,}86\,\text{mm}^2$

c) $2{,}5\,\text{mm}^2$

Sèrie 1

Exercici 1

Q1 c **Q2** a **Q3** c **Q4** a **Q5** b

Exercici 2

a) $R_3 = \dfrac{V_3}{A_3} = 2\,\Omega$

b) $U_2 = R_2\left(A_3 - A_1\right) + V_3 = 16\,\mathrm{V}$

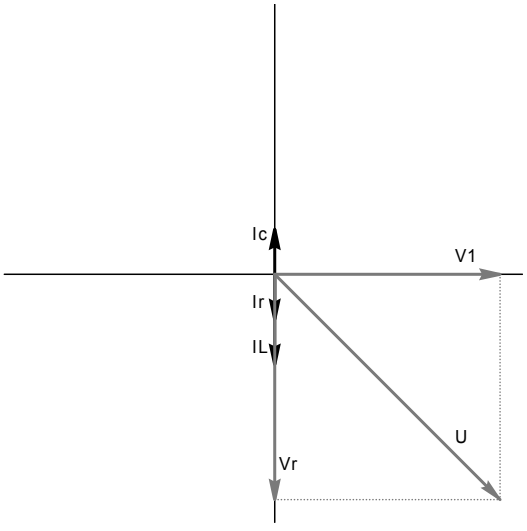
c) $U_1 = R_1 A_1 + V_3 \Rightarrow \mathrm{R}_1 = 1\,\Omega$

OPCIÓ A

Exercici 3

a) $I_L = \dfrac{V_1}{X_L} = 9\,\mathrm{A}\,;\; I_C = \dfrac{V_1}{X_C} = 4{,}5\,\mathrm{A}$

b) $I_R = I_L - I_C = 4{,}5\,\mathrm{A}$



c) $U = \sqrt{V_r^2 + V_1^2} = \sqrt{(RI)^2 + V_1^2} = \sqrt{(40 \cdot 4{,}5)^2 + 180^2} = 254{,}6\ \mathrm{V}$

Exercici 4

d) $\eta = 100\dfrac{P}{\sqrt{3}\,U\,I\cos\varphi} = 90{,}56\,\%$

e) 3 parells de pols

f) $n = 975\,\text{min}^{-1} \Rightarrow \omega = 102{,}1\dfrac{\text{rad}}{\text{s}}\,;\, T = \dfrac{P}{\omega} = 156{,}7\,\text{Nm}$

g) Estrella; $I_1 = 30\,\text{A}$

OPCIÓ B

Exercici 3

e) $Z = \sqrt{R^2 + X^2} = 10{,}77\,\Omega\,;\; I_B = \dfrac{U}{Z} = 37{,}14\,\text{A}$

f) $I_L = \sqrt{3} I_B = 64{,}33\,\text{A}$

g) $P = 3\,R\,I_B^2 = 41381\,\text{W}$

h) $Q = 3\,X\,I_B^2 = 16553\,\text{VAr}$

i) $S = \sqrt{3}\,U\,I = 44569\,\text{VA}\,;\cos\varphi = \dfrac{P}{S} = 0{,}928$

Exercici 4

d) $P = U\,I \Rightarrow I = 17{,}39\,\text{A}$

e) $R = \rho\dfrac{2l}{S} = 0{,}1339\,\Omega\,;\; \Delta U(\%) = 100\dfrac{R\,I}{U} = 1{,}01\%$

f) $20\,\text{A}$