

Sèrie 1

**Primera part****Exercici 1**

Q1 a      Q2 c      Q3 a      Q4 a      Q5 d

**Exercici 2**

a)  $V_3 = U_1 - U_2 = 70 \text{ V}$

b)  $I_1 = \frac{U_1}{R_2} + \frac{V_3}{R_3} = 20 \text{ A}$

c)  $I_1' = I_1 + \frac{U_1}{R_1} = 25 \text{ A}$

d)  $V_3' = V_3 = 70 \text{ V}$

e)  $P_1 = U_1 I_1' = 2500 \text{ W}$ ;  $P_2 = -U_2 \frac{V_3}{R_3} = -300 \text{ W}$

**OPCIÓ A****Exercici 3**

a)  $X = \frac{U}{I_1} = 22 \Omega$

b)  $R = \frac{U}{I_3} = 11 \Omega$

c)  $I_2 = \sqrt{I_1^2 + I_3^2} = 22,36 \text{ A}$

d)  $\cos \varphi = \frac{I_3}{I_2} = 0,8944$  (inductiu)

**Exercici 4**

a)  $P = V I \Rightarrow I = 10 \text{ A}$ ;  $S = \frac{10 \text{ A}}{3 \text{ A/mm}^2} = 3,333 \text{ mm}^2 \Rightarrow S = 4 \text{ mm}^2$

b)  $R = \rho \frac{L}{S} = 0,4465 \Omega$ ;  $\Delta u_{\%} = \frac{\Delta U}{U} 100 = \frac{0,8 R I}{U} 100 = 14,88\%$

## OPCIÓ B

## Exercici 3

$$\text{a) } V = \frac{U}{\sqrt{3}} = 127,02 \text{ V}; I_R = \frac{V_s}{R} = 31,75 \text{ A}; I_C = \frac{U_s}{X} = 12,70 \text{ A}; I_1 = \sqrt{I_R^2 + I_C^2} = 34,2 \text{ A}$$

$$\text{b) } I_2 = 0 \text{ A (equil.)}$$

$$\text{c) } \cos \varphi = \frac{I_R}{I_1} = 0,9285 \text{ (capacitiu)}$$

$$\text{d) } P = 3 \frac{V_s^2}{R} = 12,1 \text{ kW}; Q = 3 \frac{V_s^2}{X} = 4,84 \text{ kVAr}; S = \sqrt{P^2 + Q^2} = 13,03 \text{ kVA}$$

## Exercici 4

$$\text{a) } P_e = U_N I_N = 500 \text{ W}; \eta = \frac{P_N}{P_e} 100 = 80\%$$

$$\text{b) } \omega = 1600 \text{ min}^{-1} = 167,6 \frac{\text{rad}}{\text{s}}; \Gamma = \frac{P_N}{\omega} = 2,387 \text{ Nm}$$

$$\text{c) } \Gamma = K I \Rightarrow K = 0,9550 \text{ V}\cdot\text{s}; E = K\omega = 160 \text{ V}$$

$$\text{d) } U_N = R I_N + E \Rightarrow R = 16 \Omega$$