



SÈRIE 1

Exercici 1

Q1 d Q2 c Q3 b Q4 b Q5 a Q6 c Q7 c Q8 a

Exercicis 2 3 i 4

Exercici 2

2.1

$$E_{\text{aigua}} = m_a \cdot c_e \cdot \Delta T = 0,5 \cdot 4,17 \cdot (95 - 18) = 160,9 \text{ kJ}$$

2.2

$$P_{\text{crem}} = q \cdot p_c = \frac{58,44}{1000 \cdot 3600} \cdot 46 \times 10^6 = 746,7 \text{ W}$$

2.3

$$t_{\text{ideal}} = \frac{E_{\text{aigua}}}{P_{\text{crem}}} = \frac{160,9 \times 10^3}{746,7} = 215,5 \text{ s} = 3,592 \text{ min}$$

$$\eta = \frac{t_{\text{ideal}}}{t_{\text{cons}}} = \frac{3,591}{14} = 0,2566$$

o també

$$\eta = \frac{E_{\text{aigua}}}{E_{\text{crem}}} = \frac{E_{\text{aigua}}}{P_{\text{crem}} \cdot t_{\text{cons}}} = \frac{160,9}{746,7 \cdot 14 \cdot 60} = 0,2566$$

2.4

$$m_{\text{propà}} = q \cdot t_{\text{cons}} = \frac{58,44}{60} \cdot 14 = 13,64 \text{ g}$$

$$p_{\text{total}} = p_{\text{unitat}} \cdot \frac{m_{\text{propà}}}{m_{\text{cartutx}}} = 9,5 \cdot \frac{13,64}{450} = 0,2879 \text{ €}$$



Exercici 3

3.1

$$i_{\text{nec}} = \frac{n_{\text{mot}}}{n_{\text{eix}}} = \frac{1420}{600} = 2,367$$

El més proper és $i = 2,5$, És el que cal seleccionar per a minimitzar la diferència amb i_{nec}

3.2

$$n_{\text{real}} = \frac{n_{\text{mot}}}{i_{\text{real}}} = \frac{1420}{2,5} = 568 \text{ min}^{-1}$$

$$v_{\text{real}} = \omega_{\text{real}} \frac{d}{2} = n_{\text{real}} \frac{2\pi d}{60} \frac{1}{2} = 568 \frac{2\pi \cdot 0,330}{60} \frac{1}{2} = 9,814 \text{ m/s}$$

3.3

$$\Delta(\%) = \frac{v_{\text{recom}} - v_{\text{real}}}{v_{\text{recom}}} 100 = \frac{10 - 9,814}{10} 100 = 1,857 \%$$

L'error percentual és inferior al 5% recomanat pel fabricant, i per tant l'elecció compleix amb les seves recomanacions.

Exercici 4

4.1

$$P_{\text{mec}} = \frac{P_{\text{elèc}}}{\eta_{\text{alt}}} = \frac{4,96}{0,9} = 5,511 \text{ kW}$$



4.2

$$\Gamma = \frac{P_{\text{mec}}}{\omega_{\text{mot}}} = \frac{P_{\text{mec}}}{n_{\text{mot}} \frac{2\pi}{60}} = \frac{5,511 \times 10^3}{3000 \frac{2\pi}{60}} = 17,54 \text{ Nm}$$

4.3

$$q = c_e P_{\text{mec}} = 0,29 \cdot 5,511 = 1,598 \text{ kg/h}$$

$$t = \frac{\rho V}{q} = \frac{0,84 \cdot 15}{1,6} = 7,884 \text{ h}$$

4.4

$$E_{\text{elec}} = P_{\text{elèc}} t = 4,96 \cdot 7,884 = 39,10 \text{ kWh} = 140,8 \times 10^3 \text{ kJ} = 140,8 \text{ MJ}$$