

SÈRIE 4

Primera part

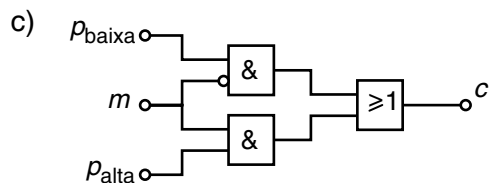
Exercici 1

Q1 b Q2 c Q3 d Q4 d Q5 b

Exercici 2

	p_{baixa}	p_{alta}	m	c
	0	0	0	0
	0	0	1	0
	0	1	0	0
a)	0	1	1	1
	1	0	0	1
	1	0	1	0
	1	1	0	x ← No és possible
	1	1	1	x ← No és possible

b) $c = p_{baixa} \cdot \bar{m} + p_{alta} \cdot m$



Segona part

OPCIÓ A

Exercici 3

a) $\varphi_1 = \arctan \frac{L}{3L} = 18,43^\circ$ $\varphi_2 = \arctan \frac{L}{5L} = 11,31^\circ$

b) $\sum \mathbf{F}_{ext} = 0 \rightarrow \begin{cases} F_1 \cos \varphi_1 - F_2 \cos \varphi_2 = 0 \\ F_1 \sin \varphi_1 + F_2 \sin \varphi_2 - mg = 0 \end{cases}$

$$F_1 = mg \frac{\cos \varphi_2}{\sin(\varphi_1 + \varphi_2)} = 67,84 \text{ kN}$$

$$F_2 = mg \frac{\cos \varphi_1}{\sin(\varphi_1 + \varphi_2)} = 65,63 \text{ kN}$$

c) $\sigma_1 = \frac{F_1}{S} = 383,9 \text{ MPa}$; $\sigma_2 = \frac{F_2}{S} = 371,4 \text{ MPa}$

Exercici 4

$$a) \eta_{\text{alt}} = \frac{P_{\text{elèc}}}{P_m} = 0,6522$$

$$b) \eta_{\text{motor}} = \frac{P_m t_{\text{au}}}{E_{\text{dipòsit}}} = \frac{P_m t_{\text{au}}}{V \rho \rho_c} = 0,3258$$

$$c) c_e = \frac{V \rho}{P_m t_{\text{au}}} = \frac{1}{\rho_c \eta_{\text{motor}}} = 240,2 \frac{\text{g}}{\text{kW} \cdot \text{h}}$$

OPCIÓ B

Exercici 3

$$a) P_{\text{cremador}} = c \rho_c = 990 \text{ W} \quad P_{\text{estufa}} = 4P_{\text{cremador}} = 3960 \text{ W}$$

$$b) t = \frac{m_b}{4 \cdot c} = \frac{\rho_c m_b}{P_{\text{estufa}}} = 43,40 \text{ h}$$

$$c) p = \frac{P_{\text{dom}}}{\rho_c m_b} = 0,0654 \text{ €}/(\text{kW} \cdot \text{h})$$

Exercici 4

$$a) L = 2(12 \cdot r + 2\pi \cdot r) = 18,28 \text{ m} \quad L_t = n \cdot L = 548,5 \text{ m}$$

$$b) P = P_{\text{tub}} \cdot L = 1,097 \text{ kW} \quad P_t = n \cdot P = 32,91 \text{ kW}$$

$$c) E = P_t \cdot t = 197,5 \text{ kW} \cdot \text{h}$$