

Sèrie 4

Primera part

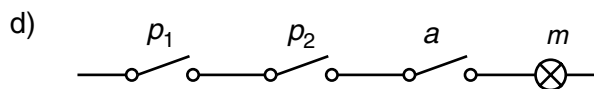
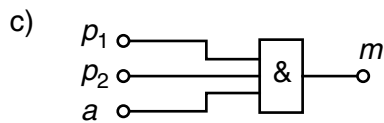
Exercici 1

Q1 a Q2 d Q3 b Q4 b Q5 d

Exercici 2

p_1	p_2	a	m
0	0	0	0
0	0	1	0
0	1	0	0
a) 0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

b) $m = p_1 \cdot p_2 \cdot a$



Segona part

OPCIÓ A

Exercici 3

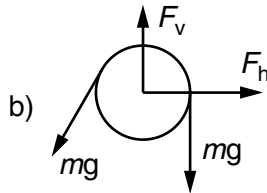
$$a) \tau = \frac{F}{S_{\text{junta}}} = \frac{F}{h b} ; h = \frac{F}{\tau b} = \frac{500}{2 \cdot 10^6 \cdot 25 \cdot 10^{-3}} = 10 \text{ mm}$$

$$b) \sigma = \frac{F}{S_b} = \frac{500}{5 \cdot 25 \cdot 10^{-6}} = 4 \text{ MPa}$$

$$c) \varepsilon = \frac{\Delta l}{l} = \frac{\sigma}{E} = \frac{4}{70 \cdot 10^3} = 57,14 \cdot 10^{-6}$$

Exercici 4

$$a) n_{\text{tambor}} = \tau n_{\text{mot}} = 0,01 \cdot 1450 = 14,50 \text{ min}^{-1} ; \quad v = \omega r = \frac{14,5 \cdot 2 \cdot \pi}{60} \cdot 0,2 = 0,3037 \text{ m/s}$$



$$F_{\text{cable}} = m g = 1200 \cdot 10 = 12 \text{ kN}$$

$$F_h = m g \sin \alpha = 1200 \cdot 10 \cdot 0,5 = 6 \text{ kN}$$

$$F_v = m g + m g \cos \alpha = 1200 \cdot 10 \cdot \left(1 + \frac{\sqrt{3}}{2}\right) = 22,39 \text{ kN}$$

$$c) P_{\text{tambor}} = F_{\text{cable}} v = 12000 \cdot 0,3037 = 3,644 \text{ kW}$$

$$P_{\text{motor}} = P_{\text{tambor}} / \eta_{\text{red}} = 3,644 / 0,75 = 4,859 \text{ kW}$$

OPCIÓ B**Exercici 3**

$$a) P = \lambda \frac{S}{e} \Delta T = 1,7 \frac{1,5}{0,01} 12 = 3060 \text{ W}$$

$$b) E = P t = 3,060 \cdot 8 = 24,48 \text{ kWh}$$

$$c) c = \frac{E_{\text{comb}}}{\rho_c} = \frac{E_{\text{tèrmica}}}{\rho_c \eta} = \frac{3060 \cdot 8 \cdot 3600}{35 \cdot 10^6 \cdot 0,85} = 2,962 \text{ kg}$$

Exercici 4

$$a) P_{\text{elèc}} = P_{\text{rad}} \eta = S_{\text{total}} \phi \eta = 60 \cdot \pi \cdot 0,05^2 \cdot 800 \cdot 0,1 = 37,7 \text{ W}$$

$$b) I = P / U = 37,7 / 12 = 3,142 \text{ A}$$

c) Dues tirades en paral·lel de 30 cèl·lules cadascuna.