Sèrie 4

Primera part

Exercici 1 **Q1** a **Q2** d **Q3** b **Q4** b **Q5** d

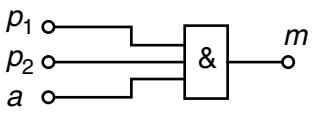
Exercici 2

a)

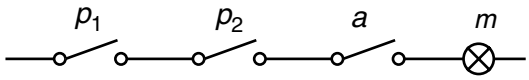
p_1	p_2	a	m
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

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

c)



d)



Segona part

OPCIÓ A

Exercici 3

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

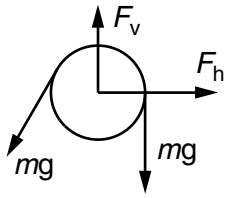
b) $\sigma = \dfrac{F}{S_b} = \dfrac{500}{5 \cdot 25 \cdot 10^{-6}} = 4\ \text{MPa}$

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

Exercici 4

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

b)



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

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

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

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

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

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

Exercici 4

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

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

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