SÈRIE 5

Primera part

Exercici 1

Q1 d **Q2** c **Q3** c **Q4** c **Q5** d

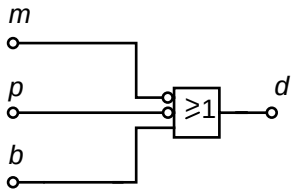
Exercici 2

m	p	b	d
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

a)

b) $\overline{d} = m \cdot p \cdot \overline{b} \Rightarrow d = \overline{m \cdot p \cdot \overline{b}} = \overline{m} + \overline{p} + b$

c)



Segona part

OPCIÓ A

Exercici 3

a) $R = \frac{U^2}{P} = \frac{230^2}{800} = 66{,}13\,\Omega$

b) $R = \rho \frac{l}{S};\ l = \frac{R\,S}{\rho} = \frac{66{,}13 \cdot 0{,}3^2 \cdot 10^{-6} \cdot \pi}{4{,}9 \cdot 10^{-7} \cdot 4} = 9{,}539\,\text{m}$

c) $E = P \cdot t = 800 \cdot 3 \cdot \frac{50}{80} = 1500\ \text{Wh} = 1{,}5\ \text{kW} \cdot \text{h} = 5{,}4\ \text{MJ}$

Exercici 4

a) $s = \frac{1}{2}(L_1 + L_2)L_3 = 0,22 \text{ m}^2$; $p = L_1 + L_2 + L_3 + \sqrt{L_3^2 + (L_1 - L_2)^2} = 2\text{m}$

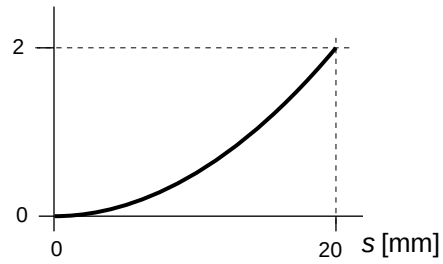
$v = c_1 s + c_2 p = 2,76 \text{ EUR}$

b) $m = s\,e\,\rho = 0,22 \cdot 10 \cdot 10^{-3} \cdot 0,7 \cdot 10^3 = 1,54 \text{ kg}$

OPCIÓ B

Exercici 3

a) Δh [mm]



b) $\sigma_n = \frac{F}{s} = \frac{mg}{\pi d^2 / 4} = 33,18 \text{ N/mm}^2 = 33,18 \text{ MPa}$

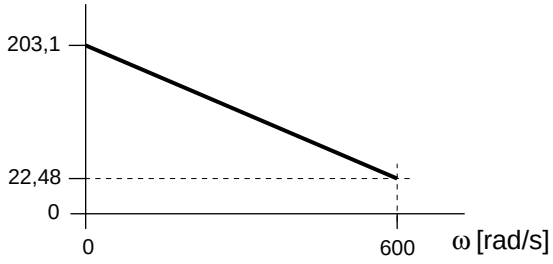
$\varepsilon = \sigma / E = 13,27 \ 10^{-3}$

c) $\Delta l = \varepsilon \ l = 7,963 \text{ mm}$

d) No varia, és sempre igual al pes del bloc

Exercici 4

a) Γ [mN·m]



b) Sense càrrega el motor es podrà accelerar fins que Γ=0.

$\omega_{màx} = \frac{k_1 U - k_2}{k_3} = 674,7 \text{ rad/s}$

$n = 3400 \text{ min}^{-1} \Rightarrow \ \omega = \frac{2\pi n}{60} = 356,0 \text{ rad/s}$

c) $\Gamma_{3400 \text{ min}^{-1}} = 95,91 \text{ mN·m}$

$E = P \cdot \Delta t = \Gamma \cdot \omega \cdot \Delta t = 68,30 \text{ Wh} = 245,9 \text{ kJ}$