

SÈRIE 1

Primera part

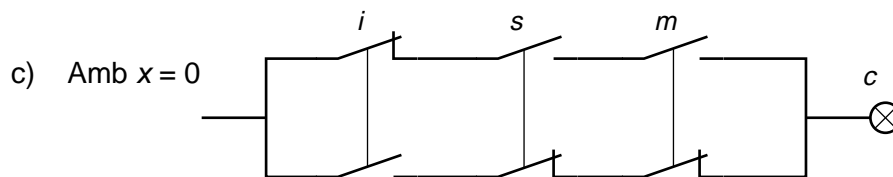
Exercici 1

Q1 d Q2 b Q3 b Q4 d Q5 b

Exercici 2

	<i>i</i>	<i>s</i>	<i>m</i>	<i>c</i>
	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 es pot donar
	1	1	1	X ← No es pot donar

b) Amb $x=0$: $c = \bar{i} \cdot s \cdot m + i \cdot \bar{s} \cdot \bar{m}$
 Amb $x=1$: $c = i \cdot \bar{m} + s \cdot m$



Segona part

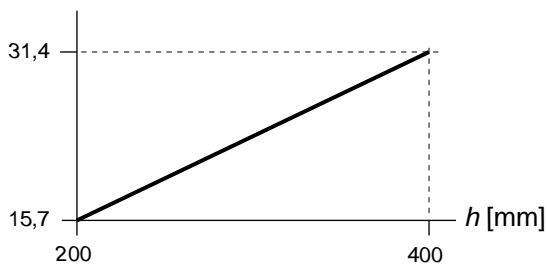
OPCIÓ A

Exercici 3

a) $V = 0,75 \cdot 1,25 \cdot h = 0,9375 \cdot h \text{ m}^3$, si h en m

$E_a = V \cdot \rho \cdot c_p \cdot \Delta t = 78,51 \cdot h \text{ MJ}$, si h en m

b) E_a [MJ]



c) $c_{\min} = E_a \cdot \frac{1}{p} \cdot \frac{1}{\eta} \cdot \frac{c}{m} = 0,89 \text{ €}$

Exercici 4

$$a) R_{\min} = \left(\frac{1}{R_1} + \frac{1}{R_2} \right)^{-1} = \left(\frac{1}{30} + \frac{1}{50} \right)^{-1} = 18,75 \Omega$$

$$b) I = \frac{U}{R_{\min}} = \frac{230}{18,75} = 12,26 \text{ A}$$

$$c) P_1 = \frac{U^2}{R_{\min}} = \frac{230^2}{18,75} = 2821 \text{ W} \quad P_2 = \frac{U^2}{R_1} = \frac{230^2}{30} = 1763 \text{ W} \quad P_3 = \frac{U^2}{R_2} = \frac{230^2}{50} = 1058 \text{ W}$$

$$d) E_{\text{elèc}} = P_1 \cdot t = 5,643 \text{ kW} \cdot \text{h}$$

OPCIÓ B

Exercici 3

$$a) P_{\text{mot}} = P_{\text{elèc}} \cdot \eta_{\text{mot}} = 12,6 \cdot 0,87 = 10,96 \text{ kW}$$

$$\Gamma_{\text{mot}} = \frac{P_{\text{mot}}}{\omega_{\text{eix}}} = \frac{P_{\text{mot}}}{\frac{n_s}{\tau} \frac{2\pi}{60}} = 69,79 \text{ Nm}$$

$$b) P_{\text{red}} = P_{\text{mot}} \cdot \eta_{\text{red}} = 10,41 \text{ kW}$$

$$\Gamma_{\text{red}} = \frac{P_{\text{red}}}{\omega_s} = \frac{P_{\text{mot}}}{n_s \frac{2\pi}{60}} = 1591 \text{ Nm}$$

$$c) P_{\text{dis}} = P_{\text{elèc}} - P_{\text{red}} = 2186 \text{ W}$$

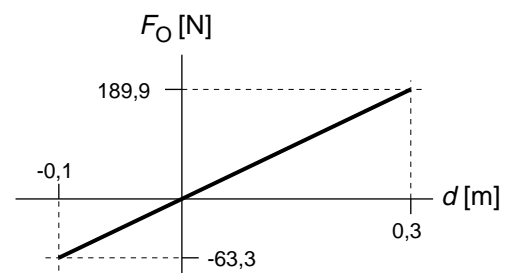
Exercici 4

$$a) \varphi = \arcsin \frac{r_b - r_r}{L} = 5,123^\circ$$

$$b) \sum M(O) = 0 \rightarrow mg(d + L \cos \varphi) - FL \cos \varphi = 0.$$

$$F = \frac{mg(d + L \cos \varphi)}{L \cos \varphi} = 882,6 \left(1 + \frac{d}{1,394} \right) \text{ N}, d \text{ en m}$$

$$c) F_O = F - mg = mg \frac{d}{L \cos \varphi} = 633,0 \cdot d \text{ N}, d \text{ en m}$$



d)

$$\omega_{\text{rem}} = \frac{v}{r_r} = 27,1 \text{ rad/s} \rightarrow n_{\text{rem}} = \omega_{\text{rem}} \frac{60}{2\pi} = 258,8 \text{ min}^{-1}$$