



SÈRIE 4

Exercici 1

Q1 c Q2 c Q3 a Q4 a Q5 c

Exercici 2

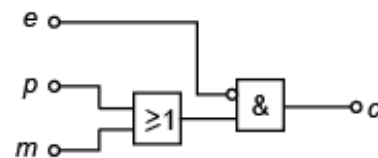
a)

m	p	e	c
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

b) $c = (\bar{m} \cdot p \cdot \bar{e}) + (m \cdot \bar{p} \cdot \bar{e}) + (m \cdot p \cdot \bar{e})$

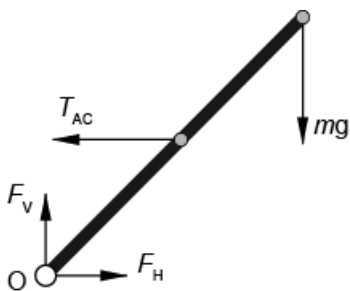
$$c = \bar{e} \cdot (p + m)$$

c)



Exercici 3

a)



b) $\sum M(O) = 0 \rightarrow mg \cdot 2L = T_{AC}L \rightarrow T_{AC} = 3923 \text{ N}$

c) $\sum F_{\text{verticals}} = 0 \rightarrow F_V = mg = 1961 \text{ N}$

$$\sum F_{\text{horizontals}} = 0 \rightarrow F_H = T_{AC} \rightarrow F_H = 3923 \text{ N}$$

d) $\sigma = \frac{T_{AC}}{\frac{\pi \cdot d^2}{4}} = 555,0 \text{ MPa};$



Exercici 4

a) $P_{\text{aigua}} = q \cdot \rho \cdot g \cdot h = 21,25 \text{ MW}$

b) $P_{\text{subm}} = P_a \eta_{\text{central}} = 19,77 \text{ MW}$

c) $E_{\text{útil}} = P_{\text{subm}} \cdot t = 158,1 \cdot 10^6 \text{ Wh} = 569,1 \cdot 10^9 \text{ J}$

d) $E_{\text{anual}} = E_{\text{útil}} \cdot 310 = 49,00 \cdot 10^9 \text{ Wh} = 176,4 \cdot 10^{12} \text{ J}$

$$\text{habitatges} = \frac{E_{\text{anual}}}{E_{\text{cons}}} = 14053 \text{ habitatges}$$

Exercici 5

a) $E_{\text{diss}} = E_{\text{bat}} \cdot (1 - \eta_{\text{motor}} \eta_{\text{red}}) = 158,4 \text{ kJ}$

b) $t_{\text{màx}} = \frac{E_{\text{bat}} - E_{\text{diss}}}{P_{\text{subm}}} = 5126 \text{ s} = 1,424 \text{ h}; \quad s_{\text{màx}} = v \cdot t = 35,60 \text{ km}$

c) $\omega_r = \frac{v}{d/2} = 19,56 \text{ rad/s}$

d) $\omega_{\text{motor}} = \frac{\omega_r}{\tau} = 301,0 \text{ rad/s}; \quad \Gamma = \frac{P_{\text{sub}} / \eta_{\text{red}}}{\omega_{\text{motor}}} = 0,8932 \text{ Nm}$

Exercici 6

a) $R_{\text{eq}} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = 35 \Omega$

$$I_{\text{tot}} = \frac{U}{R_{\text{eq}}} = 6,571 \text{ A}$$

b) $P_{\text{elèctr}} = U \cdot I = 1511 \text{ W};$

c) $E_{\text{cons}} = P_{\text{elèctr}} \cdot t = 9,069 \text{ kWh} = 32,65 \text{ MJ}$

d) $c_{\text{diari}} = E_{\text{cons}} \cdot c = 1,088 \text{ €}$