

Sèrie 3

PAU-LOGSE Curs 2001-2002

TECNOLOGIA INDUSTRIAL

**Primera part****Exercici 1**

Q1 b      Q2 c      Q3 c      Q4 b      Q5 d

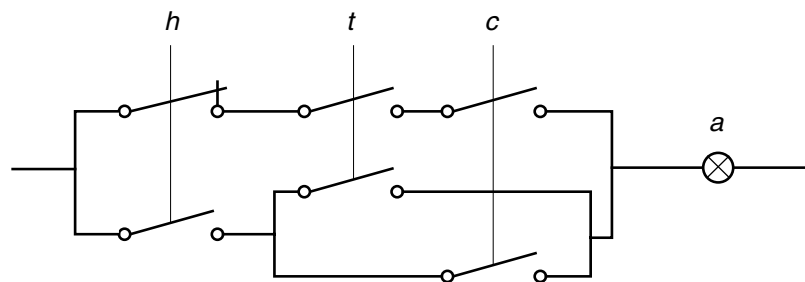
**Exercici 2**

$h$	$t$	$c$	$a$
0	0	0	0
0	0	1	0
0	1	0	0
a) 0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$$b) \quad a = \bar{h} \cdot t \cdot c + h \cdot \bar{t} \cdot c + h \cdot t \cdot \bar{c} + h \cdot t \cdot c =$$

$$\bar{h} \cdot t \cdot c + h(\bar{t} \cdot c + t \cdot \bar{c} + t \cdot c) = \bar{h} \cdot t \cdot c + h(t + c)$$

c)

**Segona part****OPCIÓ A****Exercici 3**

$$a) \quad \varphi = \arcsin \frac{h}{L} = 35,69^\circ$$

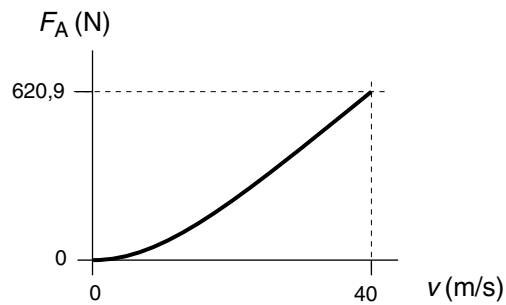
$$b) \quad \Sigma M(O)=0 \Rightarrow F h - mg \frac{L}{2} \cos \varphi = 0 \Rightarrow F = \frac{1}{h} mg \frac{L}{2} \cos \varphi = 174 \text{ N (tracció)}$$

$$c) \quad F_{OH} = F = 174 \text{ N (positiva cap a la dreta)} \quad F_{OV} = mg = 250 \text{ N (positiva cap amunt)}$$

$$d) \quad \sigma_N = \frac{F}{s_c} = \frac{174}{3 \cdot 10^{-6}} = 58 \text{ MPa}$$

**Exercici 4**

a)



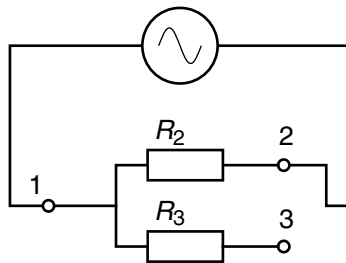
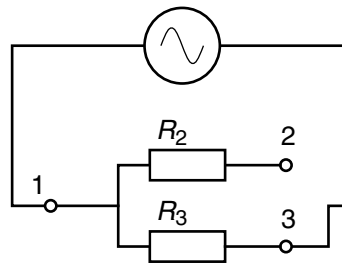
$$b) F_a|_{90 \text{ km/h}} = \frac{1}{2} \cdot 0,33 \cdot 1,225 \cdot 1,92 \cdot \left(\frac{90}{3,6}\right)^2 = 242,6 \text{ N}$$

$$P = F_a v = 242,6 \cdot (90 / 3,6) = 6064 \text{ W}$$

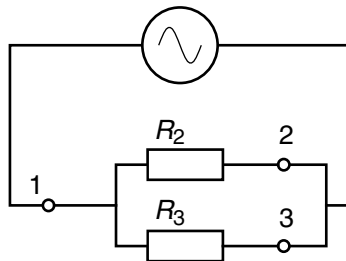
$$c) m_c = \frac{E}{\rho_c} = \frac{F_a|_{90 \text{ km/h}} d}{\rho_c} = \frac{242,6 \cdot 100 \cdot 10^3}{12 \cdot 10^6} = 2,02 \text{ kg}$$

**OPCIÓ B****Exercici 3**

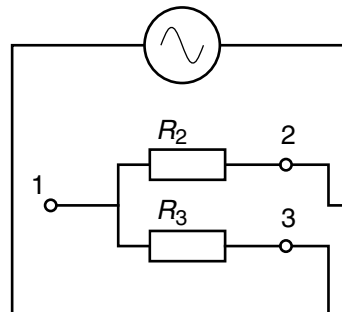
a)

Posició "Només  $R_2$ "Posició "Només  $R_3$ "

Posició "Paral·lel"



Posició "Sèrie"



$$b) R_{eq.} = \frac{R_2 \cdot R_3}{R_2 + R_3} = 720 \Omega$$

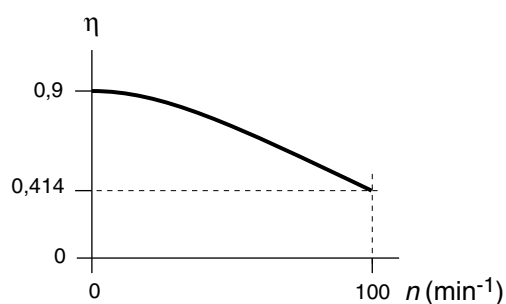
$$c) P = U^2 / R_{eq.} = 67,22 \text{ W}$$

$$R_{eq.} = R_2 + R_3 = 3 \text{ k}\Omega$$

$$P = U^2 / R_{eq.} = 16,13 \text{ W}$$

**Exercici 4**

a)



$$b) P_{màq} = \frac{E_v}{\text{periode}} = \frac{E_v}{1/n} = \frac{4,5 \cdot 80}{60} = 6 \text{ kW}$$

$$c) E_m = \frac{P}{\eta} t = \frac{6}{0,9 - 0,7 \left( \frac{80}{120} \right)^2} 5 = 50,94 \text{ kW} \cdot \text{h}$$

Sèrie 2

PAU-LOGSE Curs 2000-2001

TECNOLOGIA INDUSTRIAL

**Primera part****Exercici 1**

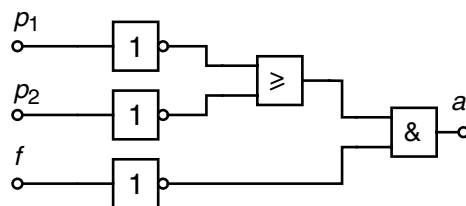
Q1 c      Q2 a      Q3 d      Q4 c      Q5 d

**Exercici 2**

$p_1$	$p_2$	$f$	$a$
0	0	0	1
0	0	1	0
0	1	0	1
a) 0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

$$b) \quad a = \bar{p}_1 \cdot \bar{p}_2 \cdot \bar{f} + \bar{p}_1 \cdot p_2 \cdot \bar{f} + p_1 \cdot \bar{p}_2 \cdot \bar{f} = \bar{f}(\bar{p}_1 \cdot (\bar{p}_2 + p_2) + p_1 \cdot \bar{p}_2) = \bar{f}(\bar{p}_1 + p_1 \cdot \bar{p}_2) = \bar{f}(\bar{p}_1 + \bar{p}_2)$$

c)

**Segona part****OPCIÓ A****Exercici 3**

$$a) \quad m = \rho V = \rho (0,5 \text{ b h e}) = 2700 \cdot (0,5 \cdot 0,6 \cdot 1,2 \cdot 0,01) = 9,72 \text{ kg}$$

$$b) \quad \Sigma M(O) = 0 \Rightarrow F h - m g (b/3) = 0 \Rightarrow F = m g b / 3 h = 16,2 \text{ N}$$

$$c) \quad F_{OH} = -F = 16,2 \text{ N (positiva cap a l'esquerra)}$$

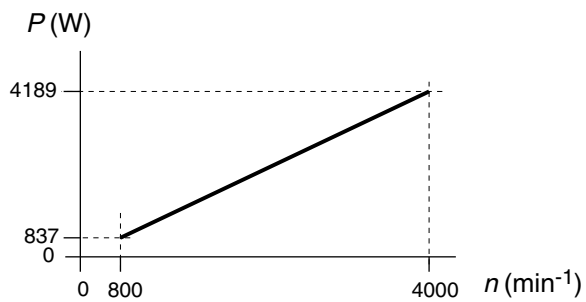
$$F_{OV} = m g = 97,2 \text{ N (positiva cap amunt)}$$

**Exercici 4**

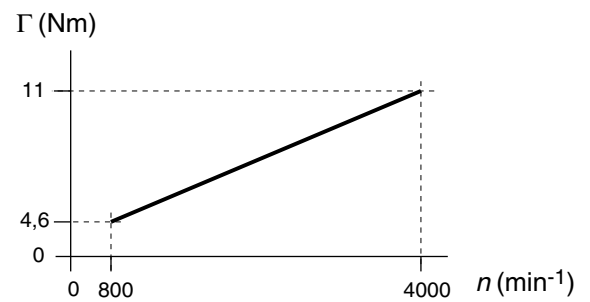
$$a) \quad P_{\text{màx.}} = \Gamma_m \omega_{\text{màx.}} = 10 \cdot 4000 \frac{2\pi}{60} = 4189 \text{ W}$$

$$P_{\text{mín.}} = \Gamma_m \omega_{\text{mín.}} = 10 \cdot 800 \frac{2\pi}{60} = 837,8 \text{ W}$$

b)



c)



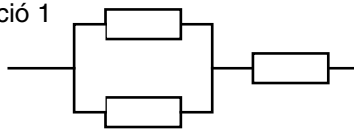
$$d) \Gamma_m = \Gamma_{m\grave{a}q.} \Rightarrow 10 = 3 + 2 \cdot 10^3 n_{r\grave{e}gim} \Rightarrow n_{r\grave{e}gim} = 3500 \text{ min}^{-1}$$

## OPCIÓ B

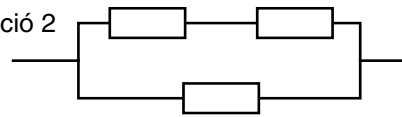
## Exercici 3

a)

Posició 1



Posició 2



$$b) R_{eq.} = \frac{R}{2} + R = 90 \, \Omega$$

$$R_{eq.} = \frac{2R \cdot R}{2R + R} = 40 \, \Omega$$

$$c) P = U^2 / R_{eq.} = 537,8 \, W$$

$$P = U^2 / R_{eq.} = 1210 \, W$$

## Exercici 4

$$a) E_{dia} = m_b p_b = 30 \cdot 10^3 \cdot 9 = 270 \, GJ = 75 \cdot 10^3 \, kW \cdot h$$

$$P_{mitjana} = E_{dia} / t = 75 \cdot 10^3 / 24 = 3125 \, kW$$

$$b) m = \frac{E_{dia} \eta}{c_e \Delta T} = \frac{270 \cdot 10^9 \cdot 0,6}{4,18 \cdot 10^3 \cdot 50} = 775 \cdot 10^3 \, kg$$

$$c) q = \frac{m \rho}{t} = \frac{775 \cdot 10^3 \cdot 1}{24 \cdot 3600} = 8,971 \, l/s$$