

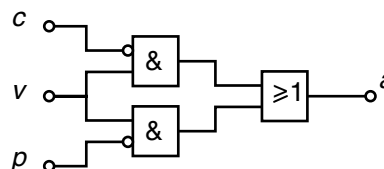
**SÈRIE 2****Primera part****Exercici 1**

Q1 a      Q2 a      Q3 b      Q4 c      Q5 a

**Exercici 2**

	v	c	p	a
	0	0	0	0
	0	0	1	0
	0	1	0	0
a)	0	1	1	0
	1	0	0	1
	1	0	1	1
	1	1	0	1
	1	1	1	0

b)  $a = v \cdot \bar{c} + v \cdot \bar{p}$       c)

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

$$a) \Gamma_s = \frac{P_s}{\omega_s} = \frac{850}{5300 \frac{2\pi}{60}} = 1,532 \text{ Nm}$$

$$b) \eta = \frac{P_s}{P_{\text{elèc}}} = \frac{P_s}{U \cdot I} = \frac{850}{230 \cdot 5,5} = 0,6719 = 67,19\%$$

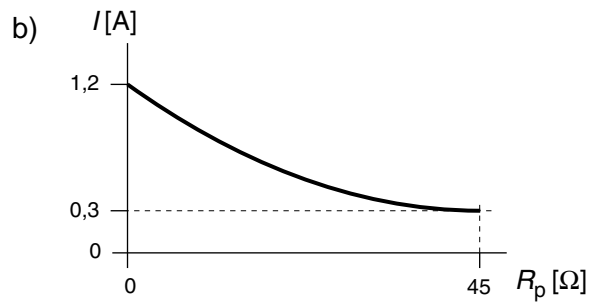
$$c) E_{\text{elèc}} = P_{\text{elèc}} \cdot t = U \cdot I \cdot t = 230 \cdot 5,5 \cdot 10 \cdot 60 = 759,0 \text{ kJ} = 210,8 \text{ W} \cdot \text{h}$$

$$E_{\text{dis}} = E_{\text{elèc}} \cdot (1 - \eta) = 249,0 \text{ kJ} = 69,16 \text{ W} \cdot \text{h}$$

$$d) c = p \cdot E_{\text{elèc}} = 0,09 \cdot 210,83 = 0,019 \text{ €}$$

#### Exercici 4

$$a) R_{\text{eq}} = \left( \frac{1}{R} + \frac{1}{R} \right)^{-1} = \frac{R}{2} = 15 \, \Omega \quad \rightarrow \quad I_{\text{màx}} = \frac{U}{R_{\text{eq}}} = \frac{18}{15} = 1,2 \, \text{A}; \quad I_{\text{mín}} = \frac{U}{R_{\text{eq}} + R_{\text{P}}} = \frac{18}{15 + 45} = 0,3 \, \text{A}$$



$$c) P_{R_{\text{màx}}} = R \left( \frac{I_{\text{màx}}}{2} \right)^2 = 30 \left( \frac{1,2}{2} \right)^2 = 10,8 \, \text{W} > P_{\text{màx}}$$

$$P_{P_{\text{màx}}} = R_P \cdot \left( \frac{U}{R_{\text{eq}} + R_P} \right)^2 = 5,4 \, \text{W}$$

## OPCIÓ B

### Exercici 3

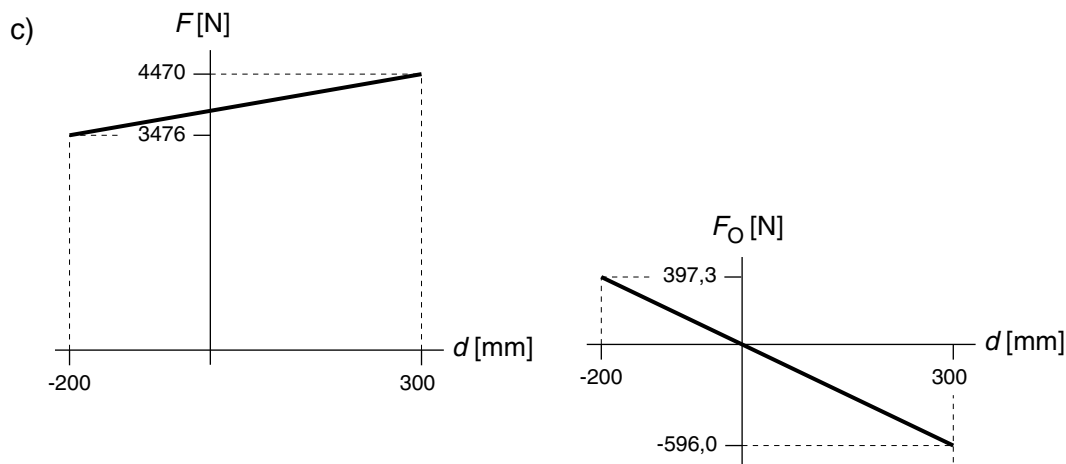
$$a) \sum M(O) = 0 \rightarrow mg(L+d) - FL = 0$$

$$F = mg \frac{(L+d)}{L} = mg \left(1 + \frac{d}{L}\right) = mg \left(1 + \frac{d}{1950}\right) \text{ N, } d \text{ en mm}$$

La roda fa sobre el terra aquesta força  $F$  avall.

$$b) F + F_O = mg \rightarrow F_O = mg - F = mg - mg \left(1 + \frac{d}{L}\right) = -mg \frac{d}{L}$$

El vehicle fa una força de valor  $mg \frac{d}{L}$  vertical avall.



$$d) d = 0 \rightarrow F_O = 0 \text{ i } F = 3874 \text{ N}$$

### Exercici 4

$$a) P_m = P_{\text{elèc}} \cdot \eta_{\text{mot}} = U \cdot I \cdot \eta_{\text{mot}} = 230 \cdot 16 \cdot 0,75 = 2760 \text{ W} = 2,76 \text{ kW}$$

$$\Gamma_m = \frac{P_m}{\omega_m} = \frac{P_m}{n \frac{2\pi}{60}} = \frac{2760}{1390 \frac{2\pi}{60}} = 18,96 \text{ Nm}$$

$$b) \eta_{\text{red}} = \frac{P_{\text{càrrega}}}{P_m} = \frac{mgv}{P_m} = \frac{3000 \cdot 9,807 \cdot \frac{2}{35}}{2760} = 0,6091 = 60,91\%$$

$$c) P_{\text{dis}} = P_{\text{elèc}} - P_{\text{càrrega}} = U \cdot I - mgv = 1999 \text{ W}$$

$$P_{\text{dis}} = P_{\text{elèc}} - P_{\text{elèc}} \cdot \eta_m \cdot \eta_{\text{red}} = 1999 \text{ W}$$