

## SÈRIE 2

### Primera part

#### Exercici 1

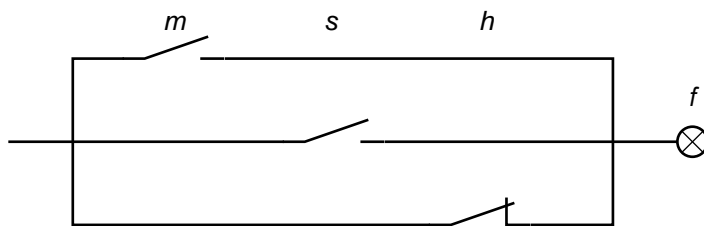
Q1 d      Q2 a      Q3 d      Q4 b      Q5 c

#### Exercici 2

| $m$  | $s$ | $h$ | $f$ |
|------|-----|-----|-----|
| 0    | 0   | 0   | 1   |
| 0    | 0   | 1   | 0   |
| 0    | 1   | 0   | 1   |
| a) 0 | 1   | 1   | 1   |
| 1    | 0   | 0   | 1   |
| 1    | 0   | 1   | 1   |
| 1    | 1   | 0   | 1   |
| 1    | 1   | 1   | 1   |

$$b) \quad f = \bar{m} \cdot \bar{s} \cdot \bar{h} + \bar{m} \cdot s \cdot \bar{h} + \bar{m} \cdot s \cdot h + m \cdot \bar{s} \cdot \bar{h} + m \cdot \bar{s} \cdot h + m \cdot s \cdot \bar{h} + m \cdot s \cdot h = \overline{m \cdot s \cdot h} = m + s + \bar{h}$$

c)



### Segona part

#### OPCIÓ A

#### Exercici 3

a)  $m = \rho V = \rho (0,5 a b e) = 1200 (0,5 \cdot 0,5 \cdot 0,9 \cdot 0,008) = 2,16 \text{ kg}$

b)  $\Sigma M(O) = 0 \Rightarrow F a - m g (a/3) = 0 \Rightarrow F = m g / 3 = 7,061 \text{ N}$

$F_{OH} = 0$

$F_{OV} = m g - F = 14,12 \text{ N}$  (positiva cap amunt)

c)  $\Sigma M(O) = 0 \Rightarrow F_P b - m g (a/3) = 0 \Rightarrow F_P = m g a / (3 b) \Rightarrow F_P = F a / b = F 5/9$

$\Rightarrow F_P < F \Rightarrow$  Cal fer menys força si s'aplica a P

### Exercici 4

$$a) E_{\text{dia}} = V_a \rho c_e \Delta T = 60 \cdot 1 \cdot 4,18 \cdot 10^3 (60 - 13) = 11,79 \text{ MJ} = 3,274 \text{ kW h}$$

$$b) E_{\text{solar}} = I \cdot t = 16,28 \text{ MJ/m}^2 = 4,522 \text{ kW h/m}^2$$

$$c) \eta = 0,78 - 3,6 \frac{50 - 17}{476} = 0,5304 \Rightarrow 53,04\%$$

$$d) S = \frac{E_{\text{dia}}}{E_{\text{solar}} \eta} = \frac{3,274}{4,522 \cdot 0,5304} = 1,365 \text{ m}^2$$

### OPCIÓ B

#### Exercici 3

$$a) \eta = \frac{P_1}{P_{\text{mag}}} = \frac{800}{920} = 0,8696 \Rightarrow 86,96\%$$

$$b) P_2 \rightarrow \frac{650}{800} = 81,25\% \quad P_3 \rightarrow \frac{450}{800} = 56,25\% \quad P_4 \rightarrow \frac{160}{800} = 20\% \quad P_5 \rightarrow \frac{90}{800} = 11,25\%$$

$$c) P_{\text{aux}} = P_{\text{consum}} - P_{\text{mag}} = 1250 - 920 = 330 \text{ W}$$

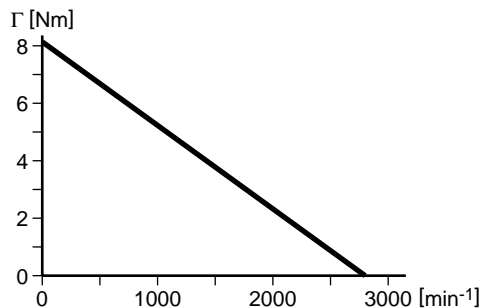
$$E_{\text{elèc}} = (P_{\text{aux}} + \frac{P_2}{\eta}) t = (330 + \frac{650}{0,8696}) 6 \cdot 60 = 387,9 \text{ kJ} = 0,1078 \text{ kW h}$$

#### Exercici 4

$$a) P = \Gamma \omega ; \Gamma = (0,84 - 0,0003 n) 30/\pi$$

$$\Gamma_0 = 0,84 \cdot 30/\pi = 8,021 \text{ Nm}$$

b)



$$c) \Gamma = \Gamma_{\text{màq}}$$

$$(0,84 - 0,0003 n) 30/\pi = 6 \text{ Nm} \Rightarrow n = 705,6 \text{ min}^{-1}$$