

## Sèrie 3

## Primera part

## Exercici 1

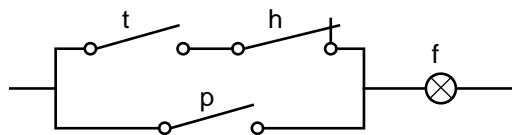
Q1 d    Q2 a    Q3 c    Q4 c    Q5 b

## Exercici 2

	t	h	p	f
	0	0	0	0
	0	0	1	1
	0	1	0	0
a)	0	1	1	1
	1	0	0	1
	1	0	1	1
	1	1	0	0
	1	1	1	1

$$b) \quad f = \bar{t} \cdot \bar{h} \cdot p + \bar{t} \cdot h \cdot p + t \cdot \bar{h} \cdot \bar{p} + t \cdot \bar{h} \cdot p + t \cdot h \cdot p = \\ t \cdot \bar{h} \cdot \bar{p} + p \cdot (\bar{t} \cdot \bar{h} + \bar{t} \cdot h + t \cdot \bar{h} + t \cdot h) = t \cdot \bar{h} \cdot \bar{p} + p = t \cdot \bar{h} + p$$

c)



## Segona part

## OPCIÓ A

## Exercici 3

$$a) \quad P_b = \frac{P}{20} = 18 \text{ W}$$

$$b) \quad I = \frac{P}{U} = 1,565 \text{ A} \quad ; \quad R = \frac{U_{\text{bombeta}}}{I} = \frac{230/20}{1,565} = 7,347 \Omega$$

$$c) \quad E_{\text{total}} = P t = 360 \cdot 4 \cdot 3600 = 5,184 \text{ MJ} = 1,44 \text{ kWh} \\ E_b = E_{\text{total}} / 60 = 86,4 \text{ kJ} = 24 \text{ Wh}$$

**Exercici 4**

$$a) P_{\text{sub}} = \frac{P_{\text{elec}}}{\eta_{\text{generador}} \eta_{\text{generador}}} = 1018 \text{ kW}$$

$$b) \Gamma_{\text{màx. entrada}} = \frac{P_{\text{sub}}}{\omega_{\text{mínima}}} = \frac{1018 \cdot 10^3}{13 \frac{2\pi}{60}} = 747,5 \text{ kNm}$$

$$\Gamma_{\text{màx. sortida}} = \frac{P_{\text{sub}} \eta_{\text{multiplicador}}}{\omega_{\text{mínima}} \tau_{\text{multiplicador}}} = \frac{1018 \cdot 10^3 \cdot 0,67}{13 \frac{2\pi}{60} \cdot 71} = 7,054 \text{ kNm}$$

$$c) P_{\text{mult}} = P_{\text{sub}} (1 - \eta_{\text{multiplicador}}) = 335,8 \text{ kW}$$

$$P_{\text{gen}} = P_{\text{sub}} \eta_{\text{multiplicador}} (1 - \eta_{\text{generador}}) = 81,82 \text{ kW}$$

**OPCIÓ B****Exercici 3**

$$a) m = S e \rho = \frac{\pi r^2}{\sin \alpha} e \rho = 19,50 \text{ kg}$$

$$b) \sum F_{\text{verticals}} = 0 \Rightarrow F_P \cos \beta = mg \Rightarrow F_P = 220,9 \text{ N}$$

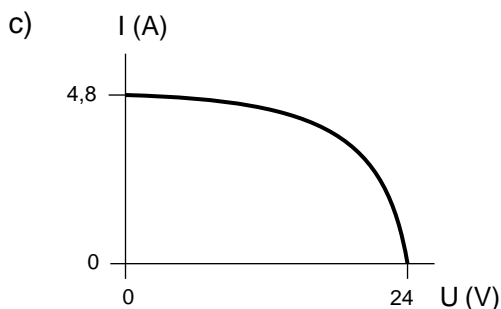
$$\sum F_{\text{horizontals}} = 0 \Rightarrow F_Q = F_P \sin \beta = 110,4 \text{ N}$$

c) En ser les forces en els anclatges les dues úniques forces amb component horitzontal, aquestes components han de ser iguals.

**Exercici 4**

$$a) I_{\text{sc}} = 5 - 0,2 = 4,8 \text{ A}$$

$$b) 0 = 5 - \frac{0,2}{(1 - U_{\text{oc}}/30)^2} \Rightarrow U_{\text{oc}} = 24 \text{ V}$$



$$d) P = UI = 15 \cdot \left( 5 - \frac{0,2}{(1 - 15/30)^2} \right) = 63 \text{ W}$$