

**Sèrie 2**

**Primera part**

**Exercici 1**

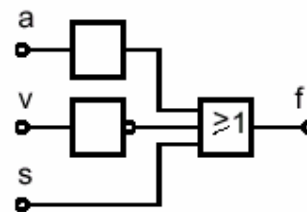
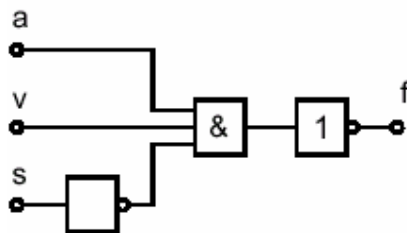
**Q1 c    Q2 d    Q3 c    Q4 b    Q5 c**

**Exercici 2**

	a	v	s	f
	0	0	0	1
	0	0	1	1
	0	1	0	1
a)	0	1	1	1
	1	0	0	1
	1	0	1	1
	1	1	0	0
	1	1	1	1

b)  $\bar{f} = a \cdot v \cdot \bar{s} \Rightarrow f = \overline{a \cdot v \cdot \bar{s}} = \bar{a} + \bar{v} + s$

c)



**Segona part**

**OPCIÓ A**

**Exercici 3**

a)  $P_1 = U \cdot I = 621 \text{ W}$  ;  $P_b = \frac{P_1}{25} = 24,84 \text{ W}$

b)  $I_b = \frac{I}{25} = 108 \text{ mA}$  ;  $R_b = \frac{U}{I_b} = 2,130 \text{ k}\Omega$

c)  $E_t = P_1 \cdot t = 4,347 \text{ kWh} = 15,65 \text{ MJ}$  ;  $E_b = \frac{E_t}{75} = 57,96 \text{ Wh} = 208,7 \text{ kJ}$

**Exercici 4**

$$a) L = L_1 + L_3 + \sqrt{L_1^2 + L_3^2} = 2243 \text{ mm} \quad ; \quad t = \frac{L}{v_{\text{tall}}} = 186,9 \text{ s}$$

$$b) d = \frac{s_{\text{triangle}}}{s_{\text{rectangle}}} \times 100 = \frac{0,5 l_1 l_3}{l_2 l_4} \times 100 = 28,57\%$$

$$c) m = (s_{\text{rectangle}} - s_{\text{triangle}}) \rho = s_{\text{rectangle}} \left(1 - \frac{d}{100}\right) \rho = \\ = \left(1 - \frac{d}{100}\right) l_2 l_4 \rho = 15,60 \text{ kg}$$

## OPCIÓ B

**Exercici 3**

$$a) \varphi = \arcsin \frac{d}{2L} = 12,84^\circ$$

$$b) m = 2L\rho = 432 \text{ kg}$$

$$c) \sum M(O) = 0 \Rightarrow F 2L \cos \varphi = mgL \sin \varphi \Rightarrow F = \frac{mg}{2} \tan \varphi = 483,0 \text{ N}$$

$$d) F_V = mg = 4238 \text{ N} \quad ; \quad F_H = F = 483,0 \text{ N}$$

**Exercici 4**

$$a) P = q \rho_{\text{aigua}} c_{\text{aigua}} \Delta t = \frac{13,2}{60} \cdot 1000 \cdot 4,18 \cdot 30 = 27,59 \text{ kW}$$

$$b) \eta = \frac{P}{q_{\text{comb.}} \rho_c} = \frac{27,59 \cdot 10^3}{0,52 \cdot 10^{-3} \cdot 62 \cdot 10^6} = 0,8558 = 85,58\%$$

$$c) t = \frac{V}{q} = 13,64 \text{ min} = 818,2 \text{ s} \quad ; \quad m = t q_{\text{comb.}} = 425,5 \text{ g}$$

**Sèrie 5**

**Primera part**

**Exercici 1**

**Q1 b      Q2 d      Q3 b      Q4 c      Q5 b**

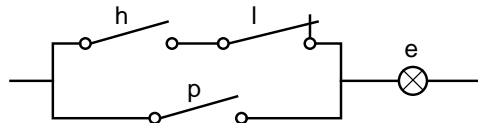
**Exercici 2**

	<i>l</i>	<i>h</i>	<i>p</i>	<i>e</i>
	0	0	0	0
	0	0	1	1
	0	1	0	1
a)	0	1	1	1
	1	0	0	0
	1	0	1	1
	1	1	0	0
	1	1	1	1

b) 
$$e = \bar{l} \cdot \bar{h} \cdot p + \bar{l} \cdot h \cdot \bar{p} + \bar{l} \cdot h \cdot p + l \cdot \bar{h} \cdot p + l \cdot h \cdot p =$$

$$p \cdot (\bar{l} \cdot \bar{h} + \bar{l} \cdot h + l \cdot \bar{h} + l \cdot h) + \bar{l} \cdot h \cdot \bar{p} = p + \bar{l} \cdot h \cdot \bar{p} = p + \bar{l} \cdot h$$

c)



**Segona part**

**OPCIÓ A**

**Exercici 3**

a)  $P_{\text{motor}} = P_{\text{elec}} \cdot \eta_{\text{mot}} = 2,805 \text{ kW}$  ;  $\Gamma_{\text{motor}} = \frac{P_{\text{motor}}}{\omega_{\text{eix}}} = \frac{P_{\text{motor}}}{\frac{n_{\text{sort}}}{\tau} \frac{2\pi}{60}} = 18,72 \text{ Nm}$

b)  $P_{\text{sortida}} = P_{\text{motor}} \eta_{\text{red}} = 1,739 \text{ kW}$  ;  $\Gamma_{\text{sortida}} = \frac{P_{\text{sortida}}}{\omega_{\text{sortida}}} = \frac{P_{\text{sortida}}}{\frac{n_{\text{sort}}}{60} \frac{2\pi}{60}} = 626,7 \text{ Nm}$

c)  $P_{\text{dissipada}} = P_{\text{elec}} - P_{\text{sortida}} = 1561 \text{ W}$

**Exercici 4**

a)  $m = sL\rho = 2280 \cdot 10^{-6} \cdot 2,5 \cdot 7,8 \cdot 10^3 = 44,46 \text{ kg}$

b) 
$$\left. \begin{array}{l} F_A \cos \alpha - F_B \cos \beta = 0 \\ F_A \sin \alpha + F_B \sin \beta - mg = 0 \end{array} \right\} \Rightarrow \begin{array}{l} F_A = 391,0 \text{ N} \\ F_B = 319,3 \text{ N} \end{array}$$

c)  $L = \frac{h}{\sin \alpha} + \frac{h}{\sin \beta} = 6,146 \text{ m}$

## OPCIÓ B

**Exercici 3**

a)  $\eta_{\text{alternador}} = \frac{P_{\text{elèctrica}}}{P_{\text{motor}}} = 0,8871 \Rightarrow 88,71\%$

b)  $\eta_{\text{motor}} = \frac{E_{\text{motor}}}{E_{\text{combustible}}} = \frac{1}{c_e \rho_c} = 0,3499 \Rightarrow 34,99\%$

c)  $c = c_e P_{\text{mec}} t = 4,557 \text{ kg}$

**Exercici 4**

a)  $P = \frac{v \rho_{\text{aigua}} c_e \Delta T}{t} = 1,045 \text{ kW}$

b)  $R = \frac{U^2}{P} = 50,62 \Omega$

c)  $L = \frac{R s}{\rho} = \frac{R \pi d^2}{4 \rho} = 6,881 \text{ m}$