

## Traitement des eaux de piscine - 3

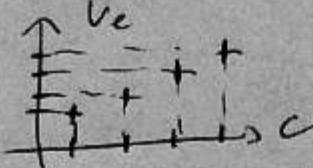
## A) Regulation

~~2,5/5~~

## Etalonnage du capteur:

~~14,3/20~~ ~~non suivi~~  
le 06.06.00

0,5 ① Au bout de 1s on est sûr d'avoir le bon résultat dans avec - de 5% d'erreur.

~~0,5~~

$$\frac{V_{e \text{ min}}}{V_{e \text{ max}}} = \frac{U_1 = 60 \text{ mV}}{U_2 = 10 \text{ mV}} = 6 \quad 0,5$$

$$C_{\text{max}} = 0,3 \text{ g/m}^3 - \frac{V_e = 95 \text{ mV}}{mep} \quad 0,5$$

1 ③  $C_{\text{min}} = 0,3 \text{ g/m}^3 \rightarrow$

1 ④ a)  $V_e = V_1 + V_d$        $\frac{V_e = 4}{= 0 \in \text{haut basculement}}$

1 b)  $\begin{cases} R_e \rightarrow \infty \\ R_s = 0 \end{cases}$

0,5 ⑤ a)  $A = \frac{V_2}{V_1} = \frac{3}{60 \cdot 10^{-3}} = 50$

1 b)  $\begin{cases} V_1 = R_1 I \\ V_2 = (R_1 + R_2) I \end{cases} \rightarrow A = \frac{V_2}{V_1} = \left(1 + \frac{R_2}{R_1}\right) \rightarrow V_2 = V_1 \left(1 + \frac{R_2}{R_1}\right)$

1 c)  $1 + \frac{R_2}{R_1} = 50 \rightarrow R_2 = 49 R_1 = 490 \Omega$

~~2) III~~ Division de tension

1) Division de tension  $\frac{U_0}{R_4} = \frac{U_{ce}}{R_3 + R_4} \rightarrow \frac{4}{10} = \frac{12}{R_3 + 10} \quad 0,5$   
car  $I^+ = 0$ ,  $I^- = \frac{U_0}{R_4}$

1,5 ⑥  $R_3 = 20 \Omega \quad 0,5$

2)  $U_c = U_o = 4V \quad \text{suivem}$

~~4~~

#### IV Commande du relais.

0,5 ①  $\boxed{NPN}$

$$0,5 \quad \text{a) } V_3 = +12V \rightarrow \boxed{D_1 \text{ anode} - \text{ et } V_{D1} = 0} \rightarrow \boxed{V_4 = 12V}$$

0,5 b)  $\boxed{T_{\text{saturation}}}$

$$0,5 \quad \text{c) } V_{CC} = V_A + \underbrace{V_T}_{0,9V} \text{ d' } T_{\text{saturation}}$$

$$1 \quad \cancel{V_A = R I_C = V_{CC}} \rightarrow I_C = \frac{V_{CC}}{R} = \frac{12V}{270} = 44,4mA > 20mA \rightarrow \boxed{\text{relais activé}} \quad \begin{matrix} 0,5 \text{ sans} \\ \text{justification} \end{matrix}$$

0,5 ③  $V_3 = -12V$

0,5 a)  $\boxed{D_1 \text{ bloqué}}$

0,5 b)  $\boxed{T \text{ bloqué}}$

0,5 ④  $\boxed{D_2 \text{ diode de varicelle}}$

~~1,5~~

$$\boxed{I_{\text{diode moléculaire}}} \quad \text{1,5} \quad Q = \frac{100m^3}{5h} = \boxed{20m^3/h}$$

$$0,5 \quad \text{2) } P = 1,2 \cdot 10^5 Pa \rightarrow P_u = 1,1kW \text{ (gaz fluide)}$$

$$0,5 \quad \text{3) } \text{diode} \rightarrow \frac{n^o}{N} = 1,1kW \quad I_N = 2,3A \quad \text{et } P_N = 0,86$$

caract. électriques.

55  
B II

230V / 400V mean

① confage reduces losses per element  
stroke 0,5 sec justification

$$\text{② } f = p n_s \quad n = 2845 \text{ rev/min} \rightarrow n_s = 3.000 \text{ rev/min} \\ = 50 \text{ Hz} \\ \text{1 rev} \quad \rightarrow p = \frac{f}{n_s} = \frac{1}{2} \quad \boxed{2 \text{ pole}} \quad \text{0,5 sec justif}$$

$$\text{③ } P_{absN} = \sqrt{3} \cdot 0,4 \cdot I_N \cdot \omega \cdot \varphi_N$$

$$\text{1 rev} \quad \boxed{P_{absN}} = \sqrt{3} \cdot p \cdot 400 \times 2,3 \times 0,86 = \boxed{1370 \text{ W}}$$

$$\text{1 } \text{④ } \eta = \frac{P_{inN}}{P_{absN}} = \frac{1100}{1370} = \boxed{80,3\%} \quad \text{approx} \quad \underline{\underline{79,5\%}} \\ \text{sort exact relation} \quad \frac{80,3 - 79,5}{79,5} = \boxed{1\%}.$$

$$\text{1 } \text{⑤ } g = \frac{n_s - n}{s n_s} = \frac{153.000 - 2845}{3.000} = \frac{155}{3.000} = \boxed{5,11\%}$$

$$0,5 \quad \text{⑥ } P_{em} = 1230 \text{ W} \quad P_{5\%} = g \cdot P_{in} = \frac{5,11}{100} \cdot 1230 = \boxed{63,6 \text{ W}}$$

