

REOLUCIÓ

EXAMEN PARCIAL 4 PUNTS ETIS - 15/12/01

$$① a) C_c = \frac{2\pi\epsilon L}{\ln \frac{b}{a}} = \frac{2\pi \cdot 2.5 \cdot 8.85 \times 10^{-12}}{\ln \frac{0.4}{0.1}} = 0.20 \text{ nF}$$

$$C_{\text{total}} = 1.00 + 0.20 = 1.20 \text{ nF}$$

$$\frac{0.20}{1.20} = 16.7 \%$$

$$b) Q = CV = 1.20 \text{ nF} \cdot 1.5 = 1.8 \text{ nC}$$

$$② C_{\text{eq}} = C + \frac{CC}{C+C} = \frac{3}{2}C \quad Q_0 \text{ es comuna} \Rightarrow$$

$$Q_0 = V_0 C$$

$$V_1 = \frac{V_0 C}{\frac{3}{2}C} = \frac{2}{3}V_0 = 8V$$

$$V_2 = V_3 = \frac{1}{3}V_0 = 4V$$

$$U_i = \frac{1}{2}CV_0^2 =$$

$$U_f = \frac{1}{2} \cdot \frac{3}{2}C \left(\frac{2}{3}V_0 \right)^2 = \frac{1}{2}CV_0^2 \cdot \frac{2}{3} \quad \left. \begin{array}{l} \\ \end{array} \right\} \Delta U = U_f - U_i = \frac{1}{2}CV_0^2 \left(\frac{2}{3} - 1 \right) = -2.4 \times 10^{-8} \text{ J}$$

$$③ R_g I_{fe} = R_p (I_m - I_{fe})$$

$$\Rightarrow R_p = \frac{36 \times 1.2}{20 - 1.2} = 2.30 \Omega \quad R_A = \frac{36 \times 2.3}{36 + 2.3} = 2.16 \Omega$$

$$④ a) \begin{array}{|c|c|c|} \hline \uparrow I_1 & \uparrow I_2 & \uparrow I_3 \\ \hline \end{array} \quad I=0$$

$$I_1 + I_2 + I_3 = 0$$

$$12 - 1.2 I_1 + 1.1 I_2 - 12.4 = 0$$

$$12.4 - 1.1 I_2 + 1.6 I_3 - 11.4 = 0$$

$$\text{solució: } I_3 = -0.3719 \text{ A}$$

$$I_2 = 0.3681 \text{ A}$$

$$I_1 = 3.8 \times 10^{-3} \text{ A}$$

$$b) V_C = 11.4 - 1.6 I_3 = 12.0 \text{ V}$$

$$Q = C \cdot V_C = 58.4 \mu\text{C}$$