Taller 1 - E.yM 01T

5%

① Falso, uno de ellos podría ser neutro y presentar fuerzas de atracción al polarizarse por inducción. (+)→←(-+)

5%

② $F' = F_0$

$$\frac{kq_1(q_2/2)}{r'^2} = \frac{kq_1 q_2}{r_0^2} \rightarrow \frac{1/2}{r'^2} = \frac{1}{r_0^2} \rightarrow 2r'^2 = r_0^2 \rightarrow \boxed{r' = \frac{r_0}{\sqrt{2}}}$$

Literal (J)

10%

① $q_A = +10\mu C$ $q_B = -6\mu C$ $M = 56\ g/mol$

$m_A = 12g$ $m_B = 12g$ $Z = 26$

ⓐ $q_N = q_A + q_B = 10\mu + (-6\mu)$ $q_A = q_N/2 = q_B$

$q_N = 4\mu C$

$\boxed{q_A = +2\mu C \quad q_B = +2\mu C}$ 5%

ⓑ $q_A = q_f - q_0 = 2\mu - 10\mu C = -8\mu C$

$q = Ne$

$$N = \frac{q}{e} = \frac{8\times10^{-6}}{1.6\times10^{-19}} \rightarrow \boxed{N = 5\times10^{13}\ e^- \text{ ganados}}$$ 5%

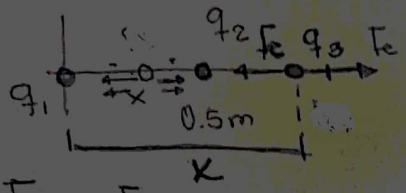
2% Solo planteamiento

ⓒ $n = \frac{m}{M} = \frac{12}{56}\ mol \rightarrow 0.2\ mol$

$$\frac{12}{56}\ mol \times \frac{6.022\times10^{23}\ atomos}{1\ mol} \times \frac{26\ \bar{e}}{1\ atomo} = \boxed{3.36\times10^{24}\ e^-}$$ Total

$$\frac{n}{n_T} = \frac{5\times10^{13}}{3.36\times10^{24}} \rightarrow \times100\% \quad \boxed{1.49\times10^{-9}\ \%}$$ 5%

②



$q_1 = +7\mu C$
$q_2 = -3\mu C$

5% (DCL Ubicación)

$F_{13} = F_{23}$

$$\frac{k q_3 q_1}{r_{13}^2} = \frac{k q_3 q_2}{r_{23}^2} \rightarrow \frac{\sqrt{q_1}}{r_{13}} = \frac{\sqrt{q_2}}{r_{23}} \Rightarrow \frac{\sqrt{7\mu}}{(x)} = \frac{\sqrt{3\mu}}{(x-0.5)}$$

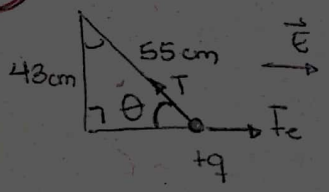
10% Igualación

$$\sqrt{7\mu}\,x - 0.5\sqrt{7\mu} - \sqrt{3\mu}\,x = 0$$

$$x = \frac{0.5\sqrt{7\mu}}{\sqrt{7\mu} - \sqrt{3\mu}} \rightarrow \boxed{x = 1.45\,m}$$

(10%) Respuesta

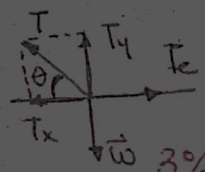
③



$m = 1g$

$\text{Sen}\theta = \frac{43}{55}$

$E = 15\,000\ N/C$ $\quad \theta = 51.4°$



3%

$w = mg = (1\times10^{-3})(9.8)$

$w = 0.0098\,N$

$F_e = qE$

$\uparrow\Sigma F_y = 0$

$T_y - w = 0$

$T_y = w$

$T = \frac{w}{\text{Sen}\theta}$

$T = \frac{0.0098}{(43/55)}$

$T = 0.0125\,N$

Ecuaciones 7%

$\rightarrow\Sigma F_x = 0$

$F_e - T_x = 0$

$F_e = T_x = T\cos\theta$

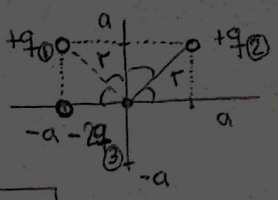
$F_e = 0.0125\cos 51.4$

$F_e = 7.8\times10^{-3}\,N$

$q = \frac{F_e}{E} = \frac{7.8\times10^{-3}}{15\,000}$

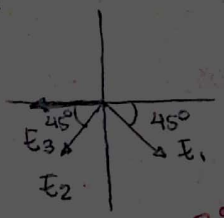
$\boxed{q = +0.52\,\mu C}$ 5%

④



$r = \sqrt{a^2 + a^2}$

$r^2 = 2a^2$



3%

$E_1 = \frac{kq}{2a^2}$ 4%

$E_2 = \frac{kq}{2a^2}$ 4%

$E_3 = \frac{2kq}{a^2}$ 4%

$\Sigma E_x = \frac{kq}{2a^2}\cos 45° - \frac{kq}{2a^2}\cos 45 - \frac{2kq}{a^2}$

$\boxed{E_x = -\frac{2kq}{a^2}}$ 5%

$\Sigma E_y = -\frac{kq\,\text{Sen}45°}{2a^2} - \frac{kq\,\text{Sen}45°}{2a^2} = -\frac{2kq}{2a^2}\text{Sen}45°$

$\boxed{E_y = -\frac{kq}{\sqrt{2}\,a^2}}$ 5%