

REPÚBLICA DE GUATEMALA, CENTROAMÉRICA  
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UNIVERSIDAD DE SAN CARLOS  
FACULTAD DE INGENIERÍA  
DEPARTAMENTO DE FÍSICA  
CURSO DE VACACIONES JUNIO 2022

Firma:

*[Handwritten signature]*

Carné : 201709088 Curso: Física 2 Sección: P  
Nombre: Leonel Antonio González García

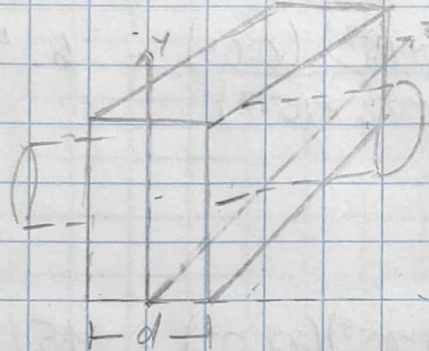
Puede iniciar su examen a partir de aquí

Pregunta 1:

$\rho = 2.5 \text{ nC/m}^3$

$d = 0.06 \text{ m}$

1)  $d = 0.02 \text{ m}$



$q_{\text{enc}} = \rho V$        $E = \frac{Q}{2\epsilon_0} \Rightarrow E = \frac{\rho d}{2\epsilon_0} = \frac{\rho d}{2\epsilon_0}$

$E = \frac{(2.5 \times 10^{-9})(0.02)}{2(8.8542 \times 10^{-12})} = 2.8235 \text{ N/C}$

2)  $d = 0.07$

$E = \frac{(2.5 \times 10^{-9})(0.07)}{2(8.8542 \times 10^{-12})} = 9.8823 \text{ N/C}$



Pregunta 2:

$$r_{int} = 0.08 \text{ m}$$

$$\text{Esfera} \rightarrow R = 0.05 \text{ m}$$

$$r_{ext} = 0.1 \text{ m}$$

$$Q_{ext} = +3 \mu\text{C}$$

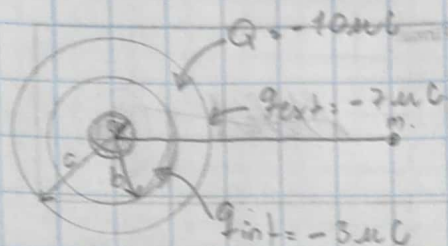
$$Q_{int} = -10 \mu\text{C}$$

$$Q_{ext} = -7 \mu\text{C}$$

$$q_{int} = Q_{int} - Q_{ext}$$

$$q_{int} = -10 \mu\text{C} - (-7 \mu\text{C})$$

$$q_{int} = -3 \mu\text{C}$$



$$\rho = \frac{Q}{V} = \frac{3 \mu\text{C}}{\frac{4}{3}\pi R^3}$$

$$\rho = \frac{3 \times 10^{-6}}{\frac{4}{3}\pi (0.05)^3} = 5.7296 \times 10^{-3}$$

1)  $r = 0.03 \text{ m}$

$$E = \frac{\rho r}{3\epsilon_0} = \frac{(5.7296 \times 10^{-3})(0.03)}{3(8.8542 \times 10^{-12})} = 6.47 \times 10^6 \text{ N/C}$$

2)  $r = 0.07 \text{ m}$

$$E = \frac{\rho r}{3\epsilon_0} = \frac{(5.7296 \times 10^{-3})(0.07)}{3(8.8542 \times 10^{-12})} = 15.1 \times 10^6 \text{ N/C}$$

3)  $m = 1 \times 10^{-3} \text{ kg}$

$$q = 0.1 \mu\text{C}$$

$$r = 0.2 \text{ m}$$

$$E(4\pi r^2) = \frac{-10 \mu\text{C}}{\epsilon_0}$$

$$E = \frac{-10 \mu\text{C}}{4\pi r^2 \epsilon_0} = -2.25 \times 10^6 \text{ N/C}$$

$$F = ma \quad F = E \cdot q$$

$$ma = E \cdot q$$

$$a = \frac{(-2.25 \times 10^6)(0.1 \times 10^{-6})}{1 \times 10^{-3}} = -2.25 \times 10^5$$