



UNIVERSIDAD DE SAN CARLOS DE GUATEMALA
FACULTAD DE INGENIERÍA
ESCUELA DE CIENCIAS
DEPARTAMENTO DE FÍSICA
ING. OSCAR TECUN

Física 2 P	Nota:
Junio 2022	
AUX. ANDREA GARCIA	

TAREA

HOJA DE TRABAJO

EXAMEN CORTO

☐
☒
☐

No.

3

CARNÉ:

201602097

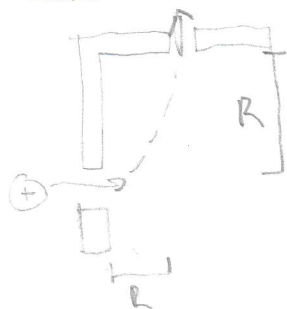
FECHA:

08/06/2022

NOMBRE:

Eduardo Fernando López Pérez

Problema #1



$$q = 1.6 \times 10^{-19} \text{ C}$$

$$m = 1.67 \times 10^{-27} \text{ kg}$$

$$E = 6.96 \frac{\text{N}}{\text{C}} \uparrow$$

$$V = 10 \times 10^3 \text{ m/s}$$

$$R = ?$$

$$F = ma$$

$$qE = ma$$

$$a = \frac{qE}{m} \uparrow$$

$$V_x = \frac{\Delta x}{t}$$

$$t = \frac{R}{V_x}$$

$$y_f = y_0 + V_{y0}t + \frac{1}{2} a_y t^2$$

$$R = \frac{1}{2} \left(\frac{qE}{m} \right) \left(\frac{R}{V_x} \right)^2 \Rightarrow \frac{2mV_x^2}{qE} = R$$

$$R = \frac{2(1.67 \times 10^{-27})(10 \times 10^3)^2 (6.96)}{(1.6 \times 10^{-19})} = 0.3 \text{ m}$$

$$R \parallel 0.3 \text{ m}$$

Problema #2



$$a) E = \frac{\sigma}{\epsilon_0} = \frac{8.85 \times 10^{-8}}{8.85 \times 10^{-12}} = 10,000 \text{ N/C}$$

$$b) a = \frac{qE}{m_p} = \frac{(1.6 \times 10^{-19})(10 \times 10^3)}{1.67 \times 10^{-27}} = 9.58 \times 10^{11} \text{ m/s}^2$$

$$y_f = y_0 + V_{y0}t + \frac{1}{2} a t^2$$

$$t = \sqrt{\frac{2y_f}{-a}} = \sqrt{\frac{2(-0.5 \times 10^{-3})}{-9.58 \times 10^{11}}} = 32.8 \text{ ns}$$

$$W = -\Delta U = U_0 - U_f$$

$$U_0 = -PE \cos \theta = (-50 \times 10^{-6})(10 \times 10^3) \cos 120 = 0.25 \text{ J}$$

$$U_f = (-50 \times 10^{-6})(10 \times 10^3) \cos(0) = -0.5 \text{ J}$$

$$W = 0.25 + 0.5 = 0.75 \text{ J}$$

R// a) 10,000 N/C

b) 32.3 ns

c) 0.75 J

Problema #3

$$\sum F_x = ma$$

$$qE = ma$$

$$a = \frac{qE}{m} = \frac{(40 \times 10^{-3})(25)}{5 \times 10^{-3}} = 20 \text{ m/s}^2 \text{ (i)}$$

$$V_{ox} = V_{ox} + at \Rightarrow 20(2) = 40 \text{ m/s (i)}$$

$$V = \sqrt{50^2 + 40^2} = 64.03 \text{ m/s}$$

R// 64.03 m/s

Problema #4

a) $\vec{L} = PE \sin \theta = (100 \times 10^6)(2000) \sin 30^\circ = 0.1 \text{ Nm}$

c) $U = -PE \cos \theta = (-100 \times 10^6)(2000) \cos 90^\circ = -0.2 \text{ J}$

d) $W = \Delta U = U_0 - U_f$

$$U_0 = -PE \cos \theta = (-100 \times 10^6)(2000) \cos 30 = -0.173 \text{ J}$$

$$U_f = -PE \cos \theta = (-100 \times 10^6)(2000) \cos(180) = 0.2 \text{ J}$$

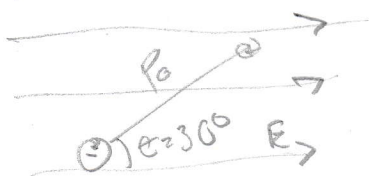
$$W = +0.173 + 0.2 = 0.373 \text{ J}$$

R// a) 0.1 N.m

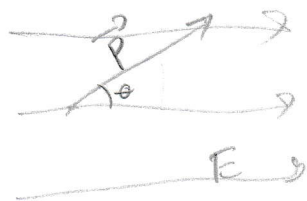
b) 0

c) -0.2 J

d) 0.373 J



Problema #5



$$W = \Delta U = U_0 - U_f$$

$$U_0 = -PE \cos \theta = -(6 \times 10^{-6})(1 \times 10^3) \cos \pi/3 = -3 \times 10^{-3} \text{ J}$$

$$U_f = -PE \cos 0 = -(6 \times 10^{-6})(1 \times 10^3) \cos 0 = -6 \times 10^{-3} \text{ J}$$

$$W = -3 \times 10^{-3} + 6 \times 10^{-3} = 3 \times 10^{-3} \text{ J}$$

$$U_0 + K_0 = U_f + K_f$$

$$U_0 - U_f = \frac{1}{2} I \omega^2$$

$$\omega = \sqrt{\frac{2(U_0 - U_f)}{I}} = \sqrt{\frac{2(3 \times 10^{-3})}{1.1 \times 10^{-11}}} = 23,354 \text{ rad/s}$$

Resposta:
a) $3 \times 10^{-3} \text{ J}$
b) $23,354 \text{ rad/s}$

Problema #6

$$p = q\Delta = (3 \times 10^{-6})(0.75) = 4.5 \times 10^{-6}$$

$$U = -PE$$

$$U = -(4.5 \times 10^{-6})(4 \times 10^{-6}) = -18 \text{ J}$$

$$U_f = -PE \cos 60 = -(4.5 \times 10^{-6})(5 \times 10^{-6}) \cos 60 = -22.5 \text{ J}$$

$$W = -22.5 + 18 = -4.5 \text{ J}$$

Resposta:
a) -18 J
b) -4.5 J

