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

Física 2 P	Nota:
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AUX. ANDREA GARCIA	

TAREA ■
HOJA DE TRABAJO ☐
EXAMEN CORTO ☐

No. 1

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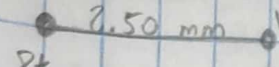
11.21 | 1



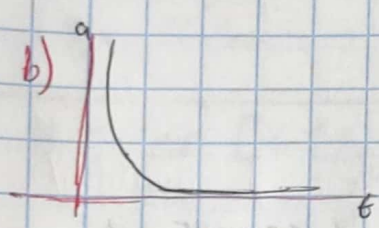
a) $E = \frac{Kq}{r^2}$

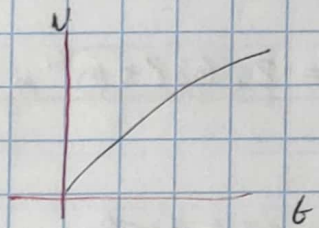
$$E = \frac{9\times10^9 (1.6022\times10^{-19})}{(2.5\times10^{-3})^2} = 2.307\times10^{-4}\ N/C$$

$$a = \frac{qE}{m} = \frac{(1.6022\times10^{-19})(2.307\times10^{-4})}{1.6726\times10^{-27}}$$

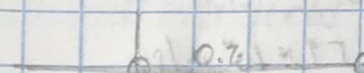
$$a = 22098.98\ m/s^2 = 2.21\times10^4\ m/s^2 \qquad a = 2.21\times10^4\ m/s^2$$

b)





17.21 | 2



$q_1 = 3\ \mu C$ $\quad F_{q_1} = 7\ N\ \hat{\imath}$

$q_2 = -5\ \mu C$

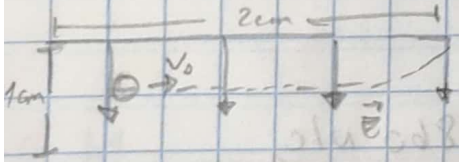
$q_3 = -8\ \mu C$

$$F_T = \frac{Kq_1q_2}{r^2}\hat{\imath} + \frac{Kq_1q_3}{r^2}\hat{\imath}$$

$$-7 = \frac{9\times10^9 (3\mu)(5\mu)}{(0.2)^2} + \frac{9\times10^9 (3\mu)(8\mu)}{r^2} = 3.375 + \frac{0.216}{r^2}$$

$$r = \sqrt{\frac{0.216}{10.37}} = 0.144\ m \qquad r = 0.144\ m$$

29.21 | 3



$V_0 = 1.60\times10^6$ m/s.

a) $\vec{E} = \frac{F}{q} = \frac{ma}{e}$

$Y_f - Y_0 = V_0 t + \frac{1}{2} a t^2$

$$a = \frac{2Y_f}{t^2} = \frac{2(5\times10^{-3})}{(1.25\times10^{-7})^2}$$

$a = 6.4\times10^{15}\ m/s^2$

$$\vec{E} = \frac{9.1094\times(6.4\times10^{15})}{1.6022\times10^{-14}} = 364\ N/C$$

$\vec{E} = 364\ N/C$

b) $a = \frac{eE}{m_p} = \frac{(1.6022 \times 10^{-19})(364)}{1.673 \times 10^{-27}} = 3.49 \times 10^{10}\ m/s^2$

$Y = \frac{1}{2}(-3.49 \times 10^{10})(1.25 \times 10^{-8})^2 = -2.73 \times 10^{-6}\ m.$

$Y = -2.73 \times 10^{-8}\ m.$

35.21 | 4

a) $Fx = q \times E = (1.602 \times 10^{-19})(1.50) = 2.403 \times 10^{-19}\ N.$

$a_x = \frac{F_x}{m} = \frac{2.403 \times 10^{-19}}{9.109 \times 10^{-31}} = 2.638 \times 10^{31}\ m/s^2$

$V_{0x} = 4.50 \times 10^5 \qquad X = 0.375 \times 10^{-6} \qquad V_x = 6.33 \times 10^5\ m/s.$

b) $a_x = \frac{-2.403 \times 10^{-19}}{1.673 \times 10^{-27}} = -1.436 \times 10^{8}\ m/s^2$

$V_x = 1.59 \times 10^{6}\ m/s.$

45.21 | 5

$F_1 = F_2 = \frac{kq^2}{r^2} = \frac{8.988 \times 10^9 (1.60 \times 10^{-19})^2}{(1.50 \times 10^{-10})^2} = 1.023 \times 10^{-8}\ N$

$F = 1.023 \times 10^{-8}\ N.$

$\theta = 0.634°$

53.21 | 6

a) $\rho = (4.5 \times 10^{-9})(3.1 \times 10^{-3})$

$\rho = 1.4 \times 10^{-11}\ \Omega m.$

$\rho = 1.4 \times 10^{-4}\ \Omega m$

b) $E = \frac{7.2 \times 10^{-9}}{1.4 \times 10^{-11} \operatorname{sen} 36.9} = 860\ N/C.$

$E = 860\ N/C.$

57.21 | 7

a) $\operatorname{Sen}\theta = \frac{1.50}{2}$ $\quad F_1 = \frac{9\times10^9 (5\times10^{-6})(10\times10^{-6})}{(0.02)^2} = 1.124\times10^3 N$

$\theta = 48.6°$

$F_{1y} = +842.6 N$

$F_{2y} = +842.6 N$

$F_y = -1680 N$

b) $F_{1x} = 743.1 N$

$\tau = 2(743.1)(0.015)$

$\tau = 22.3 N$

$\tau = 22.3 N$

83.21 | 8

a) $E = \frac{Q}{2\varepsilon_0}\left[1-\left(\frac{L^2}{x^2}+1\right)^{-1/2}\right]$

$E = \frac{7\times10^{-12}}{2(8.8542\times10^{-12})}(0.025)^2\left[1-\left(\frac{(0.025)^2}{(0.2)^2}+1\right)^{-1/2}\right] = 1.56 N/C$

$E = 1.56 N/C$

b) $E = \frac{Q}{4\pi\varepsilon_0 x^2}$ c) $0.9 N/C$ d) $E = \frac{6.3-6}{6.3}$

$E = 5\%$

$E = 5\%$

91.21 | 9

a) $Q = \sigma A = \pi(R_2^2 - R_1^2)\sigma$

$Q = \pi(R_2^2 - R_1^2)\sigma$

b) $\vec{E}(x) = \frac{\sigma}{\varepsilon_0}\left(1-\frac{1}{\sqrt{\left(\frac{x_{12}}{x^2}\right)^2+1}}\right) - \left[1-\frac{1}{\sqrt{\left(\frac{x}{x}\right)^2+1}}\right]\frac{|x|}{x}$

$\vec{E}(x) = \frac{\sigma}{\varepsilon_0}\left(1-\frac{1}{\sqrt{\left(\frac{x_{12}}{x_2}\right)^2+1}}\right) - \left(1-\frac{1}{\sqrt{\left(\frac{x_1}{x}\right)^2+1}}\right)\frac{|x|}{x}\hat{\imath}$

c) $\frac{|x|}{R_1}$

d) $F_x = \frac{-q\sigma}{2\varepsilon_0}\left(\frac{1}{R_2}-\frac{1}{R_1}\right)$

e) $x = \frac{\sigma}{2\varepsilon_0}\left(\frac{1}{R_1}-\frac{1}{R_2}\right)\frac{|x|^2}{x}$

$x = \frac{\sigma}{2\varepsilon_0}\left(\frac{1}{R_1}-\frac{1}{R_2}\right)y\,\hat{\imath}$

Ariman

Capítulo 22

9.22 | 10

a) $E = 0$ //

b) $r = 0.06\,m$

$$E = 9\times10^{9}\left(\frac{49\times10^{-6}}{(0.06)^2}\right) = 1.22\times10^{8}\ N/C$$

c) $r = 0.11\,m$

$E = 1.22\times10^{8}\ N/C$ //

$$E = 9\times10^{9}\left(\frac{49\times10^{-6}}{(0.110)^2}\right) = 3.64\times10^{7}\ N/C$$

$E = 3.64\times10^{7}\ N/C$ //

15.22 | 11

$$q = \frac{R^2E}{\frac{\pi}{4}\varepsilon_0} = \frac{(0.130)^2(1150)}{\frac{\pi}{4}(8.85\times10^{-12})} = 2.162\times10^{-9}\,C$$

$$e = \frac{2.162\times10^{-9}}{1.602\times10^{-19}} = 1.35\times10^{10}$$ //

$e = 1.35\times10^{10}$ //

33.22 | 12

$$E = \frac{\sigma}{2\varepsilon_0} = \frac{2.50\times10^{-9}}{2(8.85\times10^{-12})} = 1.41\times10^{2}\ N/C$$

$E = 1.41\times10^{2}\ N/C$ //

$$\theta = \tan^{-1}\left(\frac{5\times10^{-8}(1.41\times10^{2})}{(4\times10^{-9})(9.8)}\right) = 10.2^{\circ}$$

$\theta = 10.2^{\circ}$ //

39.22 | 13

a) $\Phi_E = \frac{\lambda L}{\varepsilon_0}$

$$E = \frac{\lambda}{2\pi\varepsilon_0 r}$$

$$E = \frac{\lambda}{2\pi\varepsilon_0 r}$$ //

b) $\Phi_E = \frac{\lambda L}{\varepsilon_0}$

$$E = \frac{\lambda}{2\pi\varepsilon_0 r}$$

$$E = \frac{\lambda}{2\pi\varepsilon_0 r}$$ //

c) $E = \frac{\lambda}{2\pi\varepsilon_0 r}$

$E = 0$ //

41.22 | 14

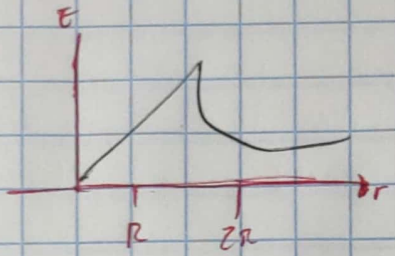
a) $E = \frac{\rho \pi R^2 L}{\varepsilon_0}$

$E = \frac{\rho}{2\varepsilon_0}$ //

b) $E = \frac{\rho \pi R^2 L}{\varepsilon_0} = \frac{\rho R^2}{2\varepsilon_0 r}$

$E = \frac{\lambda}{2\pi\varepsilon_0 r}$ //

c) $E = \frac{\rho R}{2\varepsilon_0}$

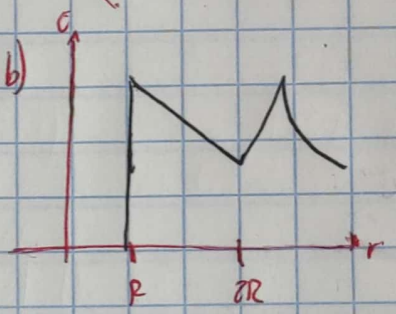


43.22 | 15

a) $E = \frac{1}{4\pi\varepsilon_0}\left(\frac{Q}{r^2}\right)$.

$E = \frac{1}{4\pi\varepsilon_0}\left(\frac{2Q}{r^2}\right)$ //

b)



57.22 | 16

a) $E = \frac{\rho(\bar{r}-\bar{b})}{3\varepsilon_0}$

b) $E = \frac{-\rho(\bar{r}-\bar{b})}{3\varepsilon_0}$

$E = \frac{\rho\bar{r}}{3\varepsilon_0} + \left(\frac{-\rho(\bar{r}-\bar{b})}{3\varepsilon_0}\right)$

$E = \frac{\rho\bar{b}}{3\varepsilon_0}$ //