Pb.1

$\frac{U}{d} = \vec{E}$ – intensitatea câmp. el.

$U = 1\,KV$

$d = 10\,cm$.

$q = e = -1{,}6 \cdot 10^{-19} C$.

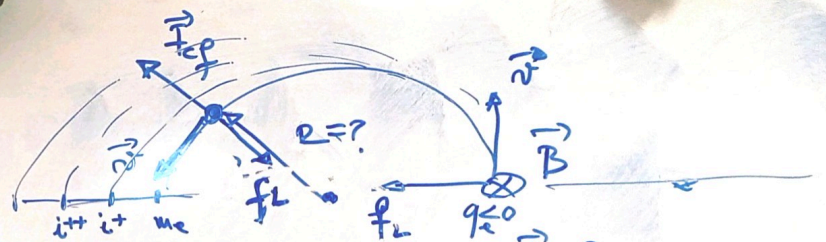
$\vec{B} = 10\,T$

$v_e = ?$

$R = ?$

$m_e = 9{,}1 \cdot 10^{-31} kg$.

$e^- = -1{,}6 \cdot 10^{-19} C$.



Cons. energiei

$$\begin{cases} L_{pq} = E_c \\ qU = \frac{m_e v_e^2}{2} \end{cases} \quad **$$

$$v_e = \sqrt{\frac{2q}{m} \cdot U}$$

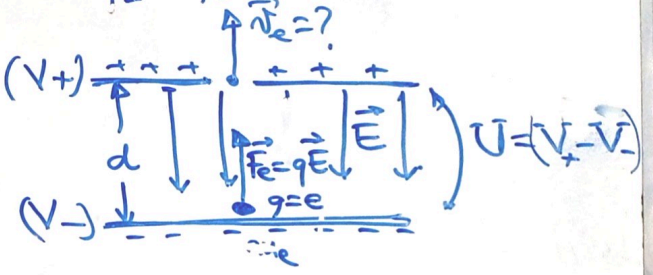
MCU: $\boxed{F_{cf} = f_L}$

$$\left(\frac{m_e \cdot v_e^2}{R}\right) = (q \cdot v_e \cdot B) \Rightarrow \boxed{R = \left(\frac{m_e v_e}{q_e \cdot B}\right)}$$

$$\vec{F}_{cf} = \left(\frac{m\vec{v}^2}{R}\right) = m\omega^2 R = m \cdot 4\pi^2 \nu^2 R = m\omega v = m \cdot \frac{4\pi^2}{T^2} \cdot R$$

$$\vec{f}_L = q(\vec{v}_e \times \vec{B})$$

$$|\vec{f}_L| = q\, v_e \cdot B \cdot \sin\alpha, \quad \alpha = (\vec{v}, \vec{B})$$



$$\begin{cases} \vec{E} = \left(\frac{U}{d}\right) ; \; q \equiv e \\ \vec{F}_e = q\vec{E} = m_e \cdot \vec{a} \; / \text{P II.} \end{cases}$$

$$e\vec{E} = m_e \cdot \vec{a}$$

$$\boxed{\vec{a} = \left(\frac{e}{m_e}\right)\vec{E}}$$

$$\begin{cases} x = x_0 + v_0 t \pm \frac{at^2}{2} \\ v = v_0 \pm at \\ v^2 = v_0^2 \pm 2a \cdot x \end{cases}$$

MRUV.

$$\begin{cases} v_e = a \cdot t \rightarrow a = v/t \\ d = \left(\frac{at^2}{2}\right) = \left(\frac{v \cdot t}{2}\right) \end{cases}$$

24.05.2021

Pb. 2

$\alpha = 45^\circ$

$U = 10\ KV.$

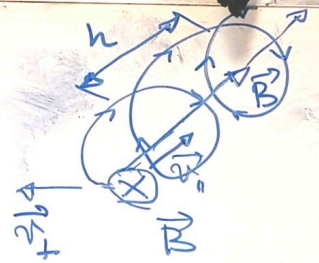
$d = 50\ cm.$

$\vec{B} = 20T\ /\ Tesla.$

$v_e = ?$

$R = ?$

$D_z = ?\ (z = 10s.)$



MCU $\perp$

$$\vec{f}_L = \vec{F}_{cp}.$$

$$|q|(\vec{v}_\perp \times \vec{B})| = \frac{m v_\perp^2}{R}$$

$$qvB = \frac{m v_\perp^2}{R} \rightarrow \boxed{R = \left(\frac{m \cdot v_\perp}{qB}\right)}$$

MRU $\quad v_\parallel = v \cos\alpha.$

$$D_z = v_\parallel \cdot z = v \cos\alpha \cdot z$$

$$h = v_\parallel \cdot T = v \cos\alpha \cdot \left(\frac{2\pi m}{qB}\right)$$

pasul spiralei

$$v_\perp = \omega R = 2\pi\nu R = \frac{2\pi}{T} \cdot R$$

$$v_\perp = \frac{2\pi}{T} \cdot R \rightarrow T = \frac{2\pi R}{v_\perp} = \frac{2\pi \cdot \left(\frac{m v_\perp}{qB}\right)}{v_\perp} = \left(\frac{2\pi m}{qB}\right) = T$$

$$\vec{B} = \vec{B}_\perp + \vec{B}_\parallel$$

$$B_\perp = B \cdot \sin\alpha.$$

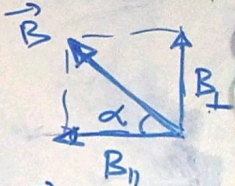
$$B_\parallel = B \cdot \cos\alpha.$$

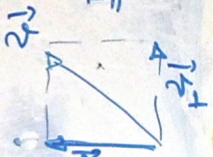
$$\vec{v} = \vec{v}_\perp + \vec{v}_\parallel$$

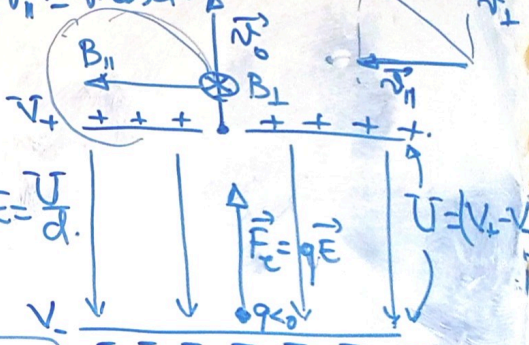
$$v_\perp = v \cdot \sin\alpha.$$

$$v_\parallel = v \cos\alpha.$$

$\ast \rightarrow$







$$E_{pp} = L_c$$

$$qU = \frac{m v^2}{2} \rightarrow \boxed{v = \sqrt{2\frac{q}{m} \cdot U}} \quad (\ast)$$