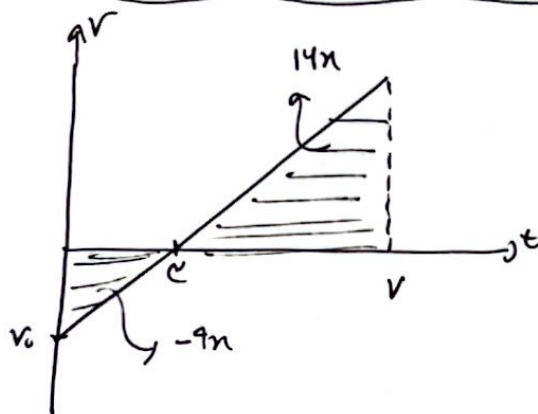


(۴۲) (۲)

مردوعای در وضعیت بیهوشند

(۴۳)
$$W_t = \Delta K = \frac{1}{2} m (v_r^2 - v_i^2)$$

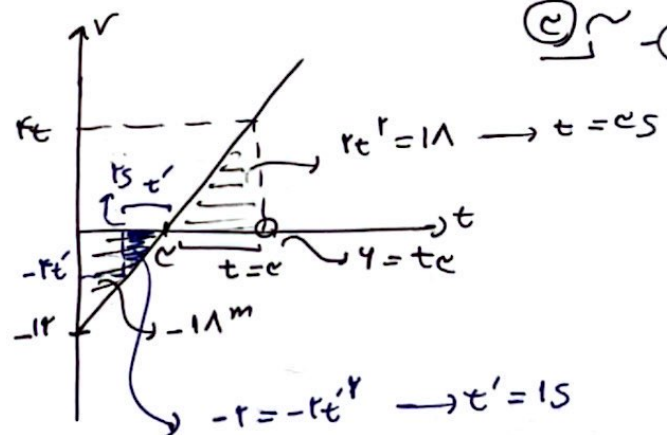
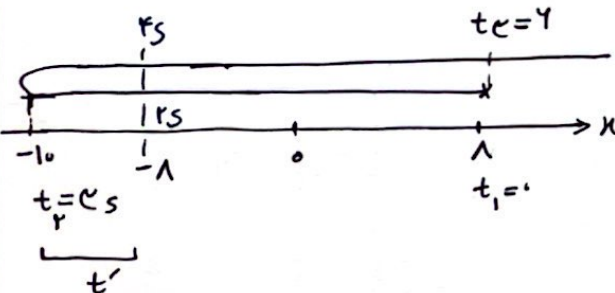
$$\rightarrow W_t = \frac{1}{2} \left(\frac{40}{1000} \right) (14^2 - 2^2) = -21.4 \text{ J}$$



$$k = \frac{r}{c} \rightarrow k' = \frac{14}{9}$$

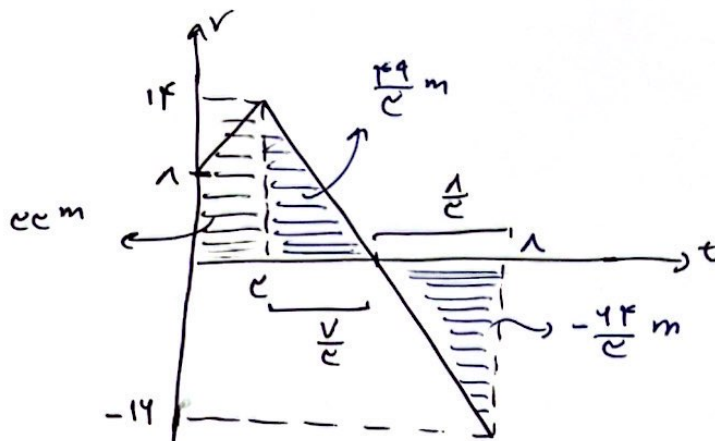
$$L = r\omega \rightarrow \frac{S_{av}}{V_{av}} = \frac{r\omega}{V}$$

$$V = 4t - 12$$



$$\Delta t = 4 - 2 = 2 \text{ s}$$

(۴۴) ~ (۴۳)



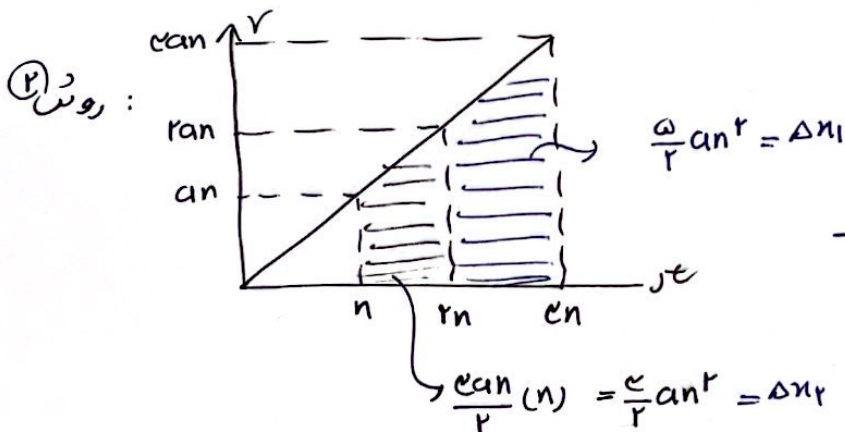
$$S_{av} = \frac{\Delta x}{\Delta t} = \frac{14c}{2c} = 7$$

روش ۱: $\Delta x_n = \frac{1}{r} a t^n (r n - 1) + r \cdot t^n$

(۴۷) ~ (۴۶)

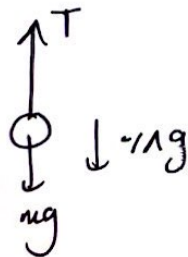
$$\Delta x_1 = \frac{1}{r} n^r (\omega) \rightarrow \frac{\Delta x_1}{\Delta n_1} = \frac{\omega}{c}$$

$$\Delta x_r = \frac{1}{r} n^r (c)$$



$$\frac{\Delta x_1}{\Delta n_1} = \frac{\omega}{c}$$

(۴۸) ~ (۴۷)



$$F_{net} = ma$$



$$-mg + T = -\frac{1}{2}mg \rightarrow T = \frac{1}{2}mg$$

$$\frac{T}{mg} = \frac{1}{2}$$



$$\tau_s = m \frac{r^2}{r} = m r \omega^2$$

(۴۹)

(۲)

$$r \uparrow \rightarrow \tau_{sB} > \tau_{sA}$$

با افزایش ω در نتیجه شدت ریب، و زورتر من لفر حوسه بایر $\tau_{s,max} \leq \tau_s$ (ط نقره)
($\tau_{s,max}$ ضرورتی است و τ_{sB} زورتر من توان به $\tau_{s,max}$ غلبه لنز و بلقر)

$v_0 = 0$

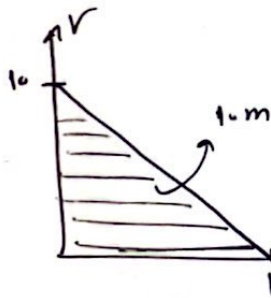
$$F_k = \mu_k \cdot F_N = \frac{1}{2} (100) = 50 \text{ N}$$

$$\downarrow$$

$$F_{net} = F - F_k = 50 \text{ N}$$

$\tau_{s,max} = \mu_s \cdot F_N$
 $= 0.5 (100) = 50 \text{ N}$

که جسم حرکت من لنز

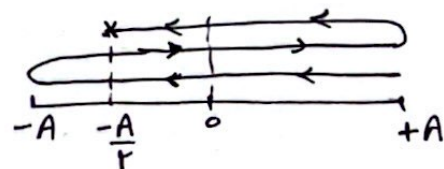


$$a = -5 \text{ m/s}^2$$

$$F - F_k = ma \rightarrow F_k = -1400(-5) = 7000 \text{ N}$$

$$T = \frac{r\pi}{14\pi} = \frac{r}{14}$$

$$\frac{t}{T} = \frac{\frac{1}{r}}{\frac{r}{14}} = \frac{14}{r^2} = 1 + \frac{1}{r}$$



$$L = \omega_1 \omega A \rightarrow \frac{L}{10 \times 1} = \frac{5 \times v}{14 \times 1}$$

$$\omega_1 = -1/5 A$$

$$= \frac{11}{5}$$

$$E = \frac{1}{r} k A^2 \rightarrow E_r = E_1 = 1 \text{ J}$$

(۳۳)
(۲)

$$\frac{q_0}{\beta} = 10 \log \frac{I}{I_0} \rightarrow \log 10^9 = \log \frac{I}{10^{-12}}$$

(۳۴)
(۱)

$$\rightarrow I = 10^{-9} \frac{W}{m^2} \quad I = \frac{P}{A}, \quad 10^{-9} = \frac{P}{10^{-4}} \rightarrow P = 10^{-5} W = 10^{-5} \text{ mW}$$

$$\Phi_n = n \Phi_1 = \frac{n v}{r L} \quad \therefore v = \sqrt{\frac{F L}{m}}$$

(۳۵)
(۲)

$$n=7 \rightarrow f_r = \frac{f}{r(74)} \sqrt{\frac{2 \times 10^4 (74)}{2 \times 10^{-9}}} = 700 \text{ Hz}$$

(۳۶)
(۲)

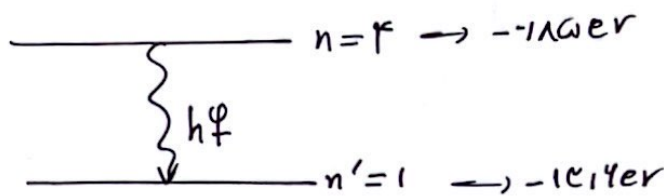
$$\frac{n'=9}{n=7} \rightarrow \frac{1}{\lambda_1} = R \left(\frac{1}{n^2 r} - \frac{1}{n'^2 r} \right) = R \left(\frac{1}{9} - \frac{1}{14} \right) = \frac{VR}{14(9)}$$

(۳۷)
(۲)

$$\rightarrow \lambda_1 = \frac{14(9)}{VR}$$

$$\frac{n'=9}{n=7} \rightarrow \frac{1}{\lambda_r} = R \left(\frac{1}{9} - \frac{1}{r\omega} \right) = R \left(\frac{14}{r\omega(9)} \right) \rightarrow \lambda_r = \frac{r\omega(9)}{14R}$$

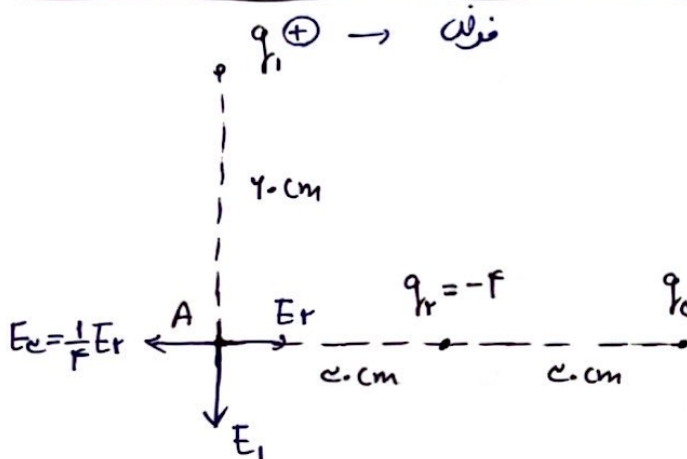
$$\frac{\lambda_1}{\lambda_r} = \frac{r\omega}{14\omega}$$



① - (۷۱)

$$h\phi = -18\omega + 13.6 = 11.4 \text{ eV}$$

$$k_{\max} = h\phi - W_0 = 11.4 \text{ eV}$$



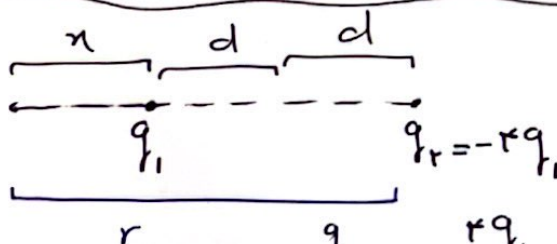
② - (۷۲)

$$E_r = \frac{q_1 \cdot 10^{-9}}{r^2} = 10^{-9} \cdot \frac{1}{r^2}$$

$$E_t = 10^{-9} \cdot \frac{1}{r^2} \cdot \frac{N}{C} \rightarrow E_i = 10^{-9} \cdot \frac{1}{r^2} \cdot \frac{N}{C}$$

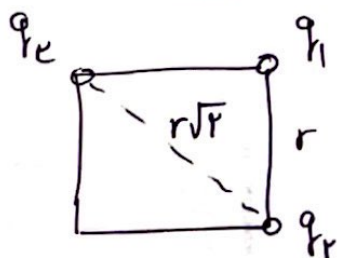
$$\frac{1}{r} E_r = 10^{-9} \cdot \frac{1}{r^2} \cdot \frac{N}{C}$$

$$E_i = 10^{-9} \cdot \frac{1}{r^2} = \frac{10^{-9} \cdot 10^{-9}}{10^{-18}} \rightarrow |q_1| = 10^{-9} \text{ C}$$



③ - (۷۳)

$$\frac{q_1}{n^2} = \frac{q_1}{(r+d)^2} \rightarrow n = r+d \rightarrow r = \frac{1}{2}d$$



④ - (۷۴)

$$\frac{F_{12}}{F_{23}} = \left(\frac{r_{12}}{r_{23}} \right)^2 = \left(\frac{r\sqrt{2}}{r} \right)^2 = 2$$

ک باز: $R_{eq} = 4\Omega$
 $I = \frac{\mathcal{E}}{R}$

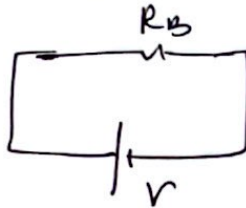
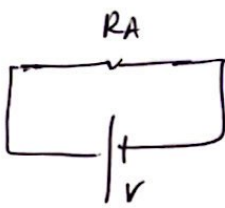
$P_{نوب} = R_{eq} \cdot I^2$
 $P_1 = \frac{\mathcal{E}^2}{4r}$

(۴۲) ~ (۴۱)

$$\rightarrow \frac{P_r}{P_1} = \frac{128}{100}$$

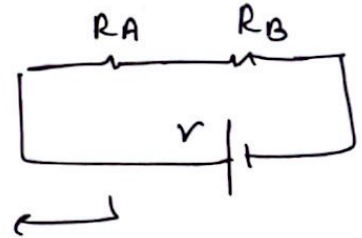
ک بسته: $R_{eq} = 2\Omega$
 $I = \frac{\mathcal{E}}{R}$

$$\rightarrow P_r = \frac{\mathcal{E}^2}{2r}$$

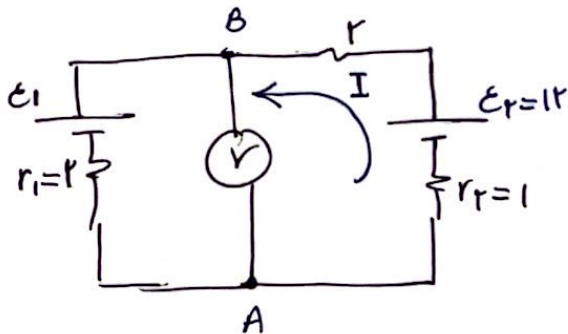


(۴۳) ~ (۴۱)

$$P = \frac{Vr}{R} \rightarrow R_A = \frac{1}{r} R_B$$



$$\frac{P_A}{P_B} = \frac{1}{r}$$



$$V_A - \mathcal{E}_1 I + 12 = V_B$$

$$V_B - V_A = 12r$$

$$-\mathcal{E}_1 I + 12 = 12r \rightarrow I = 1.2A$$

$$I = \frac{\mathcal{E}_2 - \mathcal{E}_1}{R_{eq} + r_1 + r_2} \rightarrow 1.2 = \frac{12 - \mathcal{E}_1}{5} \rightarrow \mathcal{E}_1 = 4V$$

$$P_r = \mathcal{E}_2 I - r_2 I^2 = 12(1.2) - (1)(1.2)^2$$

$$P_1 = \mathcal{E}_1 I + r_1 I^2 = 4(1.2) + 2(1.2)^2$$

$$\rightarrow \frac{P_r}{P_1} = \frac{9}{5}$$

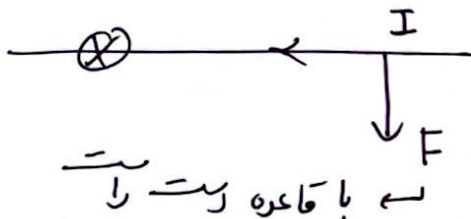
(۴۵) - (۲)

با قاعده دست راست و با توجه به مرکز کربل بر حسب نیروها می توانستیم متوجه شدیم که $q_2 > q_1$ و $q_1 < q_2$

$$F = |q_1| \sqrt{B} \sin \theta = \frac{mv^2}{r}$$

$$\rightarrow r = \frac{(mv^2)^{\frac{1}{2}}}{|q_1| B \sin \theta} \xrightarrow{r_2 > r_1} |q_2| < |q_1|$$

(۴۶) - (۳)



$$F = BIL \sin \theta$$

$$= (1.4 \times 10^{-2}) (2) (2) (1)$$

$$= 1.12 \times 10^{-2} \text{ N}$$

$$\bar{\epsilon} = -N \frac{\Delta \Phi}{\Delta t} \rightarrow \epsilon_1 = \frac{N (\Phi_{\max})}{t_1}$$

(۴۷) - (۱)

$$\epsilon_r = 0$$

$$\rightarrow \epsilon_1 = 2 \epsilon_c$$

$$\epsilon_r = 0$$

$$\epsilon_c = \frac{N \Phi_{\max}}{t_1}$$

$$U_{\max} = \frac{1}{2} L I_{\max}^2 \rightarrow 4 \times 10^{-2} = \frac{1}{2} L (2)^2 \rightarrow L = 4 \times 10^{-2} \text{ H}$$

(۴۸) - (۴)

$$L = \frac{\mu_0 N^2 A}{\ell} \rightarrow 4 \times 10^{-2} = \frac{4 (0.14) \times 10^{-2} N^2 (2 \times 10^{-2})}{4.18 \times 10^{-2}}$$

$$\rightarrow N^2 = 10^4 \rightarrow N = 100$$

$$|g| v_B \sin \theta = \frac{mv^2}{r} \rightarrow r = \frac{mv^2}{|g| v_B \sin \theta} \quad (49) \quad (1)$$

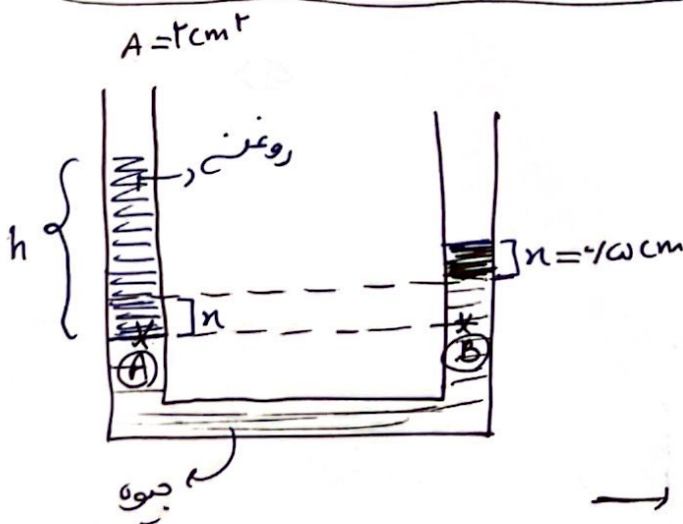
$$\rightarrow r \propto \frac{m}{|g|} \quad \begin{cases} r_a \propto \frac{rM}{re} = \frac{rM}{e} \\ r_b \propto \frac{M'}{e} \end{cases} \rightarrow M' < 2M$$

پس شعاع انحنا β کوچکتر است چون r_a بزرگتر است.

$$\frac{P_B}{P_A} = 2 \quad ; \quad P_A = 1.2 \text{ g/cm}^3 \quad (50) \quad (2)$$

$$P_B = 2.4 \text{ g/cm}^3$$

$$\rho_T = \frac{m_A + m_B}{V_A + V_B} = \frac{r m_A}{\frac{m_A}{1.2} + \frac{m_A}{2.4}} = 1.4 \text{ g/cm}^3$$



$$P_A = P_B \rightarrow P_h = P_h$$

$$\rightarrow -\rho h = 1.4 \rightarrow h = 14 \text{ cm}$$

$$V_{\text{روغن}} = Ah = 28 \text{ cm}^3$$

$$P = \frac{F}{A} = \frac{mg}{A} \rightarrow h_C > h_B > h_A$$

① - (۷۲)

← A_A از هم کوچکتر

$$\frac{+mgh}{W_{mg}} + W_{\phi} = \Delta K = \frac{1}{2} m (v_f^2 - v_i^2)$$

② - (۷۳)

$$\rightarrow + \frac{10}{7 \cdot 1 \cdot (10) \cdot (10)} + W_{\phi} = \frac{1}{2} \left(\frac{1}{10} \right) (100 - 14) = 4.7$$

$$\rightarrow W_{\phi} = -5.1 J$$

$$\phi_{\text{نرخ}} + \phi_{\text{معطف}} = |\phi_{\text{خارج}}| + |\phi_{\text{داخل}}|$$

③ - (۷۴)

$$100 (554) + 4040 = m (2204) + m (412) (100)$$

$$\rightarrow 4.140 = 2404m \rightarrow m = 1.69$$

$$T_i = T_r \rightarrow P_i V_i = P_r V_r$$

④ - (۷۵)

$$\rightarrow \left(\frac{P_0}{A} + 1.5 \right) \left(\frac{14}{1} \right) = \left(\frac{14}{A} + 1.5 \right) \left(\frac{14}{1} \right)$$

$$\rightarrow \frac{P_0 (14)}{A} = 14 \times 10^4 \rightarrow A = P_0 \times 10^{-4} m^2 = P_0 cm^2$$