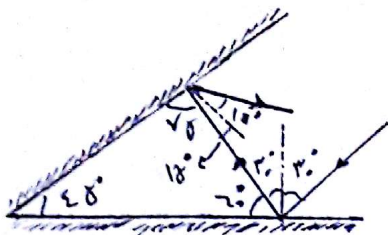


پایه کنکور فیزیک کنکور تجربی ۹۷

علم فیزیک

۱۲۰۶ زنیبر



$\theta = 15^\circ$

۱۲۰۷ زنیبر

$$\frac{1}{p} - \frac{1}{\infty} = \frac{1}{p-10} - \frac{1}{15} \rightarrow p^2 - 10p - 150 = 0 \rightarrow \underline{p = 4.5 \text{ cm}}$$

$$\frac{1}{4.5} - \frac{1}{\infty} = -\frac{1}{f} \rightarrow \underline{f = 10 \text{ cm}}$$

$$3f = 30 \rightarrow \underline{f = 10 \text{ cm}}$$

۱۲۰۸ زنیبر



$$E_1 = K_1 = \frac{1}{2} m v^2 = \frac{1}{2} \times \frac{4}{10} \times 9 \dots = 1.8 \text{ J}$$

$$E_2 = 9 \times 10 = 1.8 \text{ J} \rightarrow 1.8 = mgh = \frac{4}{10} \times 10 \times h \rightarrow \underline{h_1 = 4.5 \text{ m}}$$

در صورت نبود اصطکاک  $E_2 = E_1 \rightarrow U_2 = K_1 \rightarrow mgh = \frac{1}{2} m v^2 \rightarrow 10 \times h = \frac{1}{2} \times 9 \dots \rightarrow \underline{h_2 = 4.5 \text{ m}}$

$$h_c - h_{12} = 4.5 - 2.0 = \underline{2.5 \text{ m}}$$

۱۲۰۹ زنیبر

$h_{\text{موج}} = a$

$f_{\text{موج}} = \frac{1}{2} a$

$$\left. \begin{array}{l} h_{\text{موج}} = a \\ f_{\text{موج}} = \frac{1}{2} a \end{array} \right\} \rightarrow \frac{f_{\text{موج}}}{f_{\text{موج}}} = \frac{v_{\text{موج}}}{v_{\text{موج}}} = \frac{a^2}{\frac{1}{2} \pi b h} = \frac{a^2}{\frac{1}{2} \pi \times \frac{1}{2} a^2 a} = \underline{f}$$

۱۲۱۰ زنیبر

علماء نوین

۲۲۱ زنیبر

۲۲۲ زنیبر

$$\Delta l = \alpha L_1 \Delta \theta \rightarrow L_r = L_1 (1 + \alpha \Delta \theta) \rightarrow L_1 + \gamma \times 10^{-6} L_1 = L_1 (1 + \delta \cdot \alpha)$$

$$\rightarrow L_1 (1 + \gamma \times 10^{-6}) = L_1 (1 + \delta \cdot \alpha)$$

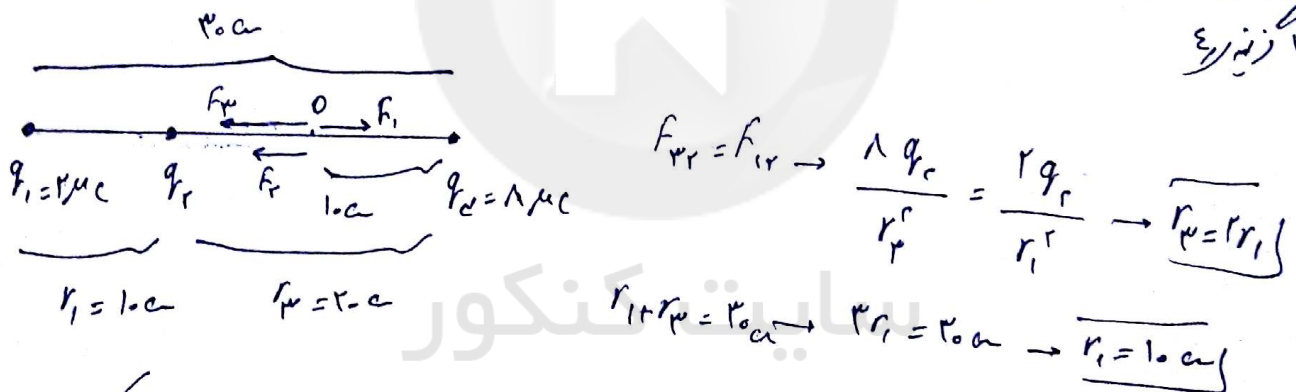
$$\rightarrow \gamma \times 10^{-6} = \delta \cdot \alpha \rightarrow \alpha = \frac{\gamma \times 10^{-6}}{\delta} \left[ \frac{1}{K} \right]$$

۲۲۳ زنیبر

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \rightarrow \frac{V_1}{T_1} = \frac{V_2}{T_2} \rightarrow \frac{r_0 \times 10^{-7}}{r_1} = \frac{r_2 \times 10^{-7}}{T_2} \rightarrow T_2 = 337 K$$

$$T_2 - T_1 = 337 - 28.5 = 308.5 K$$

۲۲۴ زنیبر



چون نیروها در یک جهت هستند

$$F_{pr} = F_{cr} \rightarrow \frac{\lambda q_c}{r_p^2} = \frac{r \lambda}{r_c^2} \rightarrow q_c = \frac{\lambda r}{r_c} = 1 \mu C$$

$q_c = -1 \mu C$  ← چون جهت نیروها برعکس است

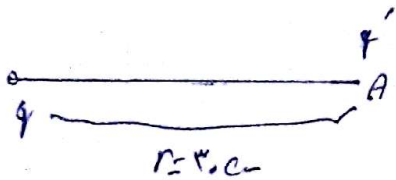
$$F_1 = 9 \times 10^9 \times \frac{2 \times 10^{-6} \times 10^{-6}}{(2 \times 10^{-2})^2} = 0.1125 N$$

$$F_2 = 9 \times 10^9 \times \frac{1 \times 10^{-6} \times 10^{-6}}{(1 \times 10^{-2})^2} = 0.9 N$$

$$F_p = 9 \times 10^9 \times \frac{1 \times 10^{-6} \times 10^{-6}}{10^{-2}} = 0.9 N \rightarrow F_T = F_r + F_p - F_1 = 0.9 + 0.9 - 0.1125 = 1.6875 N$$

سایت کنکور

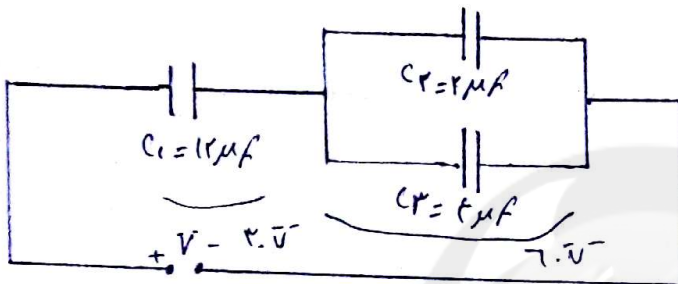
۱۲۱۵ زنیبر ۳



$$E = kq/r^2 \rightarrow 1.0 = \frac{9 \times 10^9 \times q}{9 \times 10^{-2}} \rightarrow \underline{q = 1 \mu C}$$

$$F = \frac{kqq'}{r^2} \rightarrow 2 \times 10^{-2} = \frac{9 \times 10^9 \times 10^{-6} \times q'}{9 \times 10^{-2}} \rightarrow \underline{q' = 2 \mu C}$$

۱۲۱۶ زنیبر ۳



$$E = V/d \rightarrow V = Ed \rightarrow$$

$$V_1 = 10 \times 10^3 \times 0.02 = 200 \text{ V}$$

$$V_2 = 3 \times 10^3 \times 0.02 = 60 \text{ V}$$

$$V_3 = 1 \times 10^3 \times 0.02 = 20 \text{ V}$$

برای جد کردن از فرمول خازن؟ باید دو تا خازن ۶ برابر ۶.۰۰ باشد

$$C_1 \text{ and } C_2 \rightarrow C_{1,2} = 2 \mu F \rightarrow V_{1,2} = 3.0 \text{ V} + 6.0 \text{ V} = 9.0 \text{ V}$$

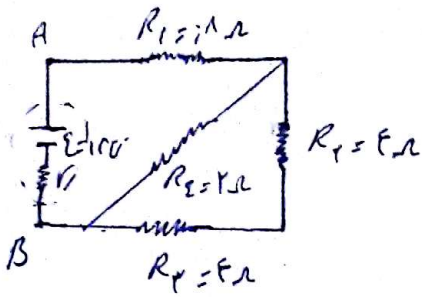
۱۲۱۷ زنیبر ۳

$$\hat{I}R \rightarrow I = \frac{\hat{\Sigma} \mathcal{E}}{\hat{\Sigma} R + \hat{\Sigma} r} \rightarrow \downarrow I$$

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$$V = \mathcal{E} - rI \rightarrow \hat{I}V \rightarrow \hat{I}V = R \hat{I}$$

۱۲۱۸ زنیبر



علی بن ابی

$$P_f = R_f I_f^2 \rightarrow \lambda = 2 I_f^2 \rightarrow \overline{I_f} = \sqrt{\lambda}$$

Re و Rr هر دو هستند!

$$R_{r,3} = 2 + 2 = 4\Omega$$

Re و Rr موازی هستند و چون این نسبت علی تفاوت است قسم می شود!

$$I_{r,3} = \frac{1}{4} \times 2 = 0.5 A$$

$$R_{r,3} \parallel R_2 \rightarrow R_7 = \frac{4 \times 2}{4+2} = 1.33\Omega$$

Re و Rr هر دو هستند و تفاوت است آن را برابر می شود!  $1.33\Omega + 0.1\Omega = 1.43\Omega$

$$V_A - 2 \times \frac{A}{r} = V_B \rightarrow \overline{V_A - V_B = 4V}$$

۱۲۱۹ زنیبر

$$A: \frac{\mu \cdot I}{2nd} - \frac{2\mu \cdot I}{1nd} = \frac{2\mu \cdot I}{1nd}$$

$$B: \frac{\mu \cdot I}{2nd} + \frac{2\mu \cdot I}{1nd} = \frac{1\mu \cdot I}{1nd}$$

$$C: \frac{\mu \cdot I}{1nd} + \frac{2\mu \cdot I}{2nd} = \frac{1.5\mu \cdot I}{1nd}$$

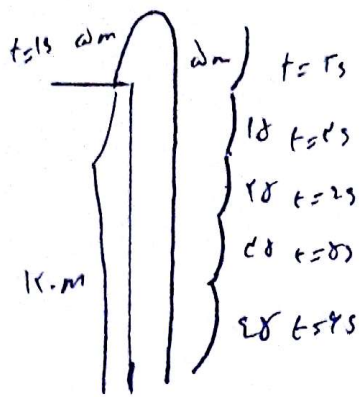
$$D: \frac{2\mu \cdot I}{2nd} - \frac{\mu \cdot I}{1nd} = \frac{1\mu \cdot I}{1nd}$$

$$\rightarrow B_C > B_B > B_D > B_A$$

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۱۲۲۰ زنیبر

$$|R_f L \frac{dI}{dt}| = |-2 \times 10^{-2} \times 0.1 \times 50000| = 1V$$

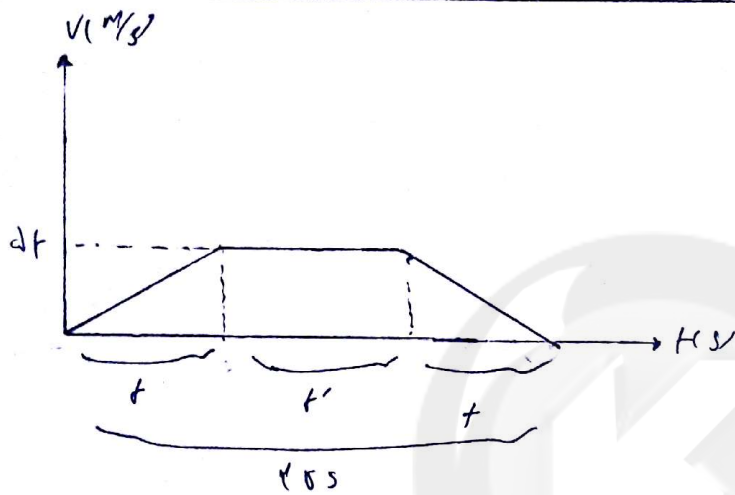


علمنا نون

$$v^r - v_i^r = -\alpha \Delta x \rightarrow 0 - 100 = -2 \times 10 \Delta x \rightarrow \Delta x = 5m \rightarrow t = 1s$$

$$\rightarrow t = 5s \quad v = \frac{\Delta x}{\Delta t} = \frac{10}{2} = 5 \text{ m/s}$$

1221



$$v = at + v_i = at$$

$$\Delta x = v \Delta t = 20 \times 20 = 400 \text{ m}$$

$$t + t + t' = 20s$$

$$\Delta x = \Delta s = \frac{(20 + t')(20)}{2} = 400 \rightarrow 20t + 20t' = 400 \rightarrow 20(\frac{20-t}{2}) + \frac{(20-t')t'}{2} = 400$$

$$\xrightarrow{x^r} 20(20-t) + (20-t')t' = 400 \rightarrow (20-t)(20+t') = 400$$

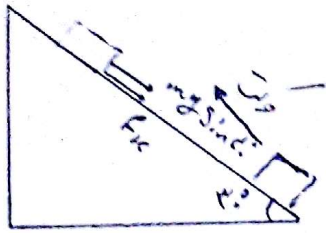
$$20t - t' = 400 \rightarrow t' = 20t - 400 \rightarrow t' = 10s$$

1222

$$20 = \frac{1}{2}(-2)t_1^r + 10t_1 \rightarrow t_1^r - 10t_1 + 20 = 0 \rightarrow t_1 = 10/c = 10s$$

$$v_1 = at_1 + v_i = (-2 \times 10) + 10 = 0$$

$$20 = \frac{1}{2}(2)t_2^r + v_0 t_2 \rightarrow t_2 = 4s \rightarrow v_2 = a t_2 + v_i = 2 \times 4 + 0 = 8 \text{ m/s}$$



کلیتاً

$$\sum F = ma \rightarrow 0 - mg \sin \alpha - f_k = ma$$

۲۲۴ (نمبر ۲)

$$v^0 - v_1^0 = \alpha \Delta x \rightarrow 0 - 14 = \alpha (1) \rightarrow \alpha = -14 \text{ m/s}^2$$

$$-10 \times \frac{1}{r} - \mu_k \times 10 \times \sqrt{2} = -14 \rightarrow \mu_k = \frac{4}{8\sqrt{2}} = \frac{\sqrt{2}}{8}$$

۲۲۴ (نمبر ۲)

تخمین از مقدار

$$\sum F = \sum ma \rightarrow m_1 g \sin \alpha - \mu_k m_1 g \cos \alpha + m_2 g \sin \alpha - \mu_k m_2 g \cos \alpha = (m_1 + m_2) a$$

$$2 \times 10 \times \frac{1}{2} - \frac{1}{2} \times 2 \times 10 \times \frac{1}{\sqrt{2}} + 10 \times 10 \times \frac{1}{2} - \frac{1}{2} \times 10 \times 10 \times \frac{1}{\sqrt{2}} = 10 a$$

$$\rightarrow \alpha = 10 \text{ m/s}^2$$

$$m_1 g \sin \alpha - \mu_k m_1 g \cos \alpha - T = m_1 a$$

$$2 \times 10 \times \frac{1}{2} - \frac{1}{2} \times 2 \times 10 \times \frac{1}{\sqrt{2}} - T = 2 \times 10 \times 10$$

$$\rightarrow (2 - \frac{1}{\sqrt{2}}) T = 10(10) \rightarrow T = \frac{100}{1 - \frac{1}{\sqrt{2}}} = 0.4 \text{ N}$$

$$K_1 x - \mu_k m g = m a \rightarrow 100 \times \frac{1}{100} - \frac{1}{100} \times 10 \times 10 = \frac{1}{100} m$$

$$\rightarrow K m = 1 \rightarrow m = 1/K$$

$$\sum F = \sum ma \rightarrow K_2 x - \mu_k m g = m a \rightarrow 100 x - \frac{1}{100} \times 10 \times 10 = \frac{1}{100} x \times 100$$

$$100 x = 1 \rightarrow x = \frac{1}{100} \text{ m} = 1 \text{ cm}$$

علمی و فنی

گزینه ۲۲۷

$$Aw = f \times t \times 10^{-2}$$

$$E = \frac{1}{2} m \omega^2 A^2 = \frac{1}{2} \times \frac{1}{10} \times 16 \times 10^{-2} = 0.08 \text{ J}$$

گزینه ۲۲۸

$$\left. \begin{array}{l} Aw^2 = \lambda \\ Aw = \tau \end{array} \right\} \rightarrow w = \frac{\tau}{\lambda} \rightarrow \text{تعداد نوسان در واحد زمان}$$

گزینه ۲۲۹

$$\frac{\lambda}{2} + \frac{\lambda}{2} = \frac{3\lambda}{2} = 1.8 \rightarrow \lambda = 1.2 \text{ m} \quad \lambda = vT \rightarrow v = 1.0 \text{ T} \rightarrow T = \frac{2}{1.0} \text{ s}$$

A و B بازتاب کننده نامبدل از مرز در این (T) اختلاف فاز در زمان داشته

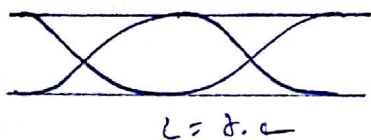
$$\frac{T}{2} = \frac{2 \times 1.2}{1.0} = 2.4 \text{ s}$$

گزینه ۲۳۰

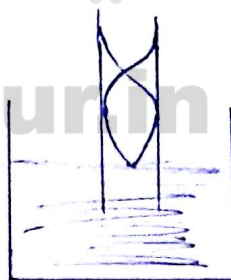
$$\beta_c - \beta_i = 10 \log \left( \frac{r_i}{r_c} \right)^2 \rightarrow \beta = 20 \log \left( \frac{r_i}{r_c} \right) \rightarrow \left( \frac{r_i}{r_c} \right)^2 = 10^{\frac{\beta}{20}} \rightarrow \frac{r_i}{r_c} = 10^{\frac{\beta}{40}}$$

$$\rightarrow r_i = r_c = 10 \text{ cm}$$

گزینه ۲۳۱



$$\lambda = 0.5 \text{ m}$$



$$\frac{3\lambda}{4} = \frac{3v\delta}{4} = 3v_1\delta$$

$$\rightarrow \delta = \frac{3v_1\delta}{4} = 1.5v_1\delta$$

سایت کنکور

$$E = \frac{hc}{\lambda} \rightarrow 33 \times 10^{-19} = \frac{44 \times 10^{-28} \times c \times 10^8}{\lambda} \rightarrow \lambda = 4 \times 10^{-10} \text{ m}$$

$$\lambda = vT \rightarrow 4 \times 10^{-10} = 3 \times 10^8 \times T$$

$$\rightarrow T = 1.33 \times 10^{-18} \text{ s}, \quad x = nT = 2T = 2.66 \times 10^{-18} \text{ s}$$

$$K_{\text{max}} = hf - W \xrightarrow{\text{بزرگ}} \frac{1 \times 10^{-19}}{1.4 \times 10^{-19}} = 1 \times 10^{-18} \times 10^{18} - W \rightarrow W = 3 \text{ eV}$$

$$K_{\text{max}} = hf - W \rightarrow K_{\text{max}} = \frac{1 \times 10^{-18} \times 3 \times 10^8}{3 \times 10^{-19}} - 3 = 1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$$

$$\frac{n_1}{n_2} = \frac{v_2}{v_1} \xrightarrow{n = \frac{c}{v}} \frac{f}{r} = \frac{v''}{v}$$

سایت کنکور

$$\alpha = \frac{e}{r} Me^{2r} \rightarrow 2.4 \times 10^{-19} \text{ C}$$

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