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حل سترجی لوالا فیزکس کنکور ایسے ریاضی تیر ۱۴۰۳

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۴۱) ~~.....~~ ۵

۴۲) ۳

۴۳) $E = \frac{1}{r} k A^r$
 $A = \text{con.}$
 $k = \text{con.}$ } $E = \text{con.} \Rightarrow$ ۴

۴۴) ۳

$$۴۵) \left. \begin{aligned} q, \epsilon x 10^{-2} &= \frac{k |q_1| |q_2|}{r^2} \\ q_1 &= 8 \mu\text{C} = q \\ q_2 &= 8 \mu\text{C} \\ E_1 &= k \frac{|q_1|}{(r)^2} = k \frac{|q_1|}{\epsilon r^2} \end{aligned} \right\} \begin{aligned} \frac{E_1}{q, \epsilon x 10^{-2}} &= \frac{1}{\epsilon} \\ \frac{E_1}{q, \epsilon x 10^{-2}} &= \frac{1}{|q_2|} \\ E_1 &= \frac{1,4 x 10^{-2}}{\epsilon x 10^{-4}} = \epsilon x 10^2 \text{ N/C} \end{aligned}$$

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$$۴۶) h = 4 \times \sin 30^\circ = 2 \text{ m}$$

$$W_{F_k} = E_f - E_i = (0 + U_f) - (K_i + 0) \Rightarrow W_{F_k} = mgh - \frac{1}{2} m v_o^2$$

$$\frac{W_{F_k}}{K_i} = \frac{mgh - \frac{1}{2} m v_o^2}{\frac{1}{2} m v_o^2} = \frac{gh - \frac{v_o^2}{2}}{\frac{v_o^2}{2}} = \frac{10 - 0}{0} = -\frac{2}{0} = -\infty$$

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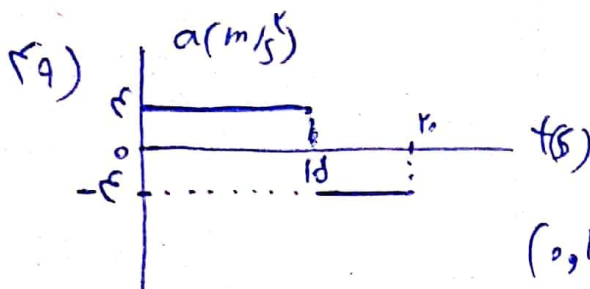
مر

(۲۷) (۴) ترینه

$$x = \frac{1}{2}at^2 - vt + 10 = 0 \Rightarrow \Delta(\Rightarrow x) = 0$$

$$(۱) v = \frac{1}{2}at - v = 0 \Rightarrow t = 10s \Rightarrow v = 0 \Rightarrow x = x_{\min}$$

$$x_{\min} = 10m \quad (۱) \quad \checkmark$$



$$\Delta V = \frac{S}{(a-t)} = S_1 + S_2$$

$$= 40 + (-20) = 20 m/s$$

$$(0, 10) S_1 \quad a_{av} = \frac{\Delta V}{\Delta t} = \frac{20}{20} = 1 m/s^2$$

(۲۹) $\checkmark$

$$d.) t = 10s \Rightarrow v_B = v_A = 10 m/s \quad a_B = 1 m/s^2$$

$$\left. \begin{aligned} x_A &= 10t + x_{0A} \\ x_B &= \frac{1}{2} \times 1 \times t^2 - 10t + x_{0B} \end{aligned} \right\} t = 10s \Rightarrow x_A = x_B - v \Delta t$$

$$10 \times 10 + x_{0A} = (0) - 10 \times 10 + x_{0B}$$

$$x_{0B} - x_{0A} = 10 + 10 = 20m$$

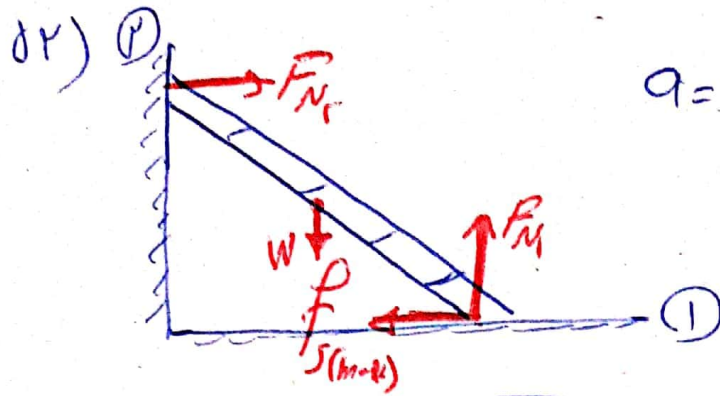
(۳۰) $\checkmark$

۳۱)

۱۸	} 10
۲۰	
۲۵	} 1.1m
۲۸	

$$|V_{av}| = \frac{|\Delta y|}{\Delta t} = \frac{10}{2} = 5 m/s$$

(۳۱) $\checkmark$



$$a=0 \Rightarrow F_{\text{net}}=0$$

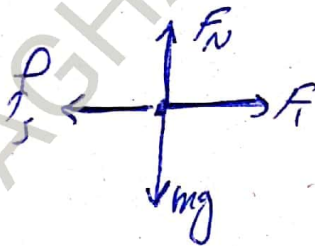
$$\begin{cases} F_N = f_{s(\max)} \\ F_{N_1} = W = \epsilon_0 N \end{cases}$$

$$f_R = \sqrt{F_N^2 + f_{s(\max)}^2} = \sqrt{N} \sqrt{1 + \mu_s^2}$$

$$14\sqrt{14} = \epsilon_0 \sqrt{1 + \mu_s^2}$$

$$14 = 14(1 + \mu_s^2) \Rightarrow \mu_s = 1.28$$

82) (b) (i):

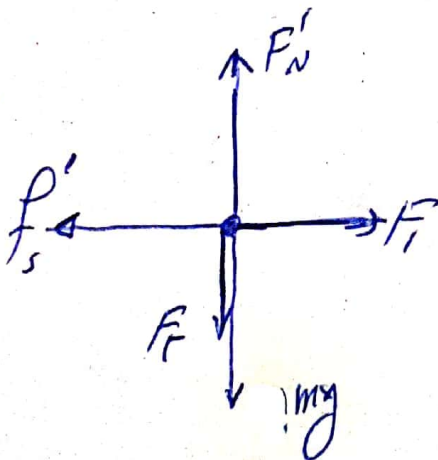


$$f_s = F = \epsilon_0 N$$

$$F_N = mg = 10\text{ N}$$

$$f_R = \sqrt{F_N^2 + f_s^2} = \epsilon_0 \sqrt{2} N$$

(b) (ii):



$$f'_s = F = \epsilon_0 N$$

$$F'_N = F + mg = \epsilon_0 + 10 = 16\text{ N}$$

$$f'_R = \sqrt{16^2 + \epsilon_0^2} = \epsilon_0 \sqrt{17}\text{ N}$$

$$f'_s = f_s, \quad f'_R = \sqrt{2} f_R$$

Q.E.D.

$$r) \quad m = \gamma(r) kg$$

$$P = -\frac{11}{8}t + 11$$

$$\frac{\Delta P}{\Delta t} = \frac{-11}{8} = -\frac{11}{8} = \text{con.}$$

$$m \times a = -\frac{11}{8}$$

$$a = \text{con.}$$

$$\gamma(r) \times a = -\frac{11}{8} \Rightarrow |a| = 11 \text{ m/s}^2$$

$$2d) \quad V_A = V_B$$

$$\frac{V_A}{V_B} = \sqrt{\frac{r_B}{r_A}} \Rightarrow \frac{V_B}{V_A} = \sqrt{\frac{r_A}{r_B}} = \sqrt{\frac{1}{2}}$$

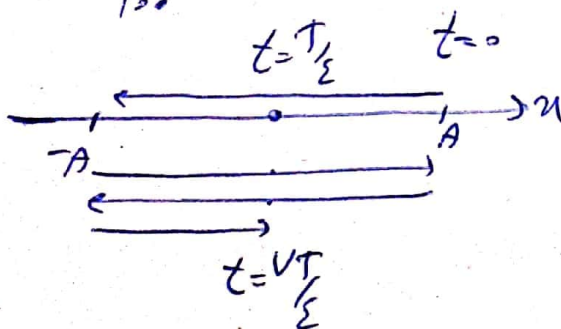
$$V = \sqrt{\frac{GM_e}{r}}$$

$$T = 2\pi \sqrt{\frac{r^3}{GM_e}}$$

$$\frac{T_A}{T_B} = \sqrt{\left(\frac{r_A}{r_B}\right)^3} = \sqrt{\left(\frac{1}{2}\right)^3} = \frac{1}{\sqrt{2}}$$

$$2e) \quad T = \frac{2\pi}{\omega} = \frac{2\pi}{10} \text{ s} \quad \left. \begin{array}{l} \frac{t}{T} = \frac{V}{\omega} \Rightarrow t = \frac{V}{\omega} \end{array} \right\} \text{معرفه فر}$$

$$t = \frac{V \cdot T}{\omega}$$



$$|V| = V_{\max} = A \cdot \omega = 1 \times 10 \times 10 = 10 \text{ m/s}$$

$$V = +10 \text{ m/s}$$

$$2v) \quad \mu = \frac{m}{L} = \frac{1}{10} = 0.1 \text{ kg/m}$$

$$V = \sqrt{\frac{F}{\mu}} = \sqrt{\frac{10}{0.1}} = 10 \text{ m/s}$$

$$\lambda = \frac{v}{f} = \frac{10}{1} = 10 \text{ cm}$$

d) 10

$$d1) \left. \begin{array}{l} v = 11.0 \text{ m/s} \\ f = 4.0 \text{ Hz} \end{array} \right\} \lambda = \frac{v}{f} \Rightarrow \lambda = \frac{11.0}{4.0} = \frac{11}{4} \text{ m} = 2.75 \text{ m}$$

$$L = \lambda/2 \quad L = n \frac{\lambda}{2} \Rightarrow$$

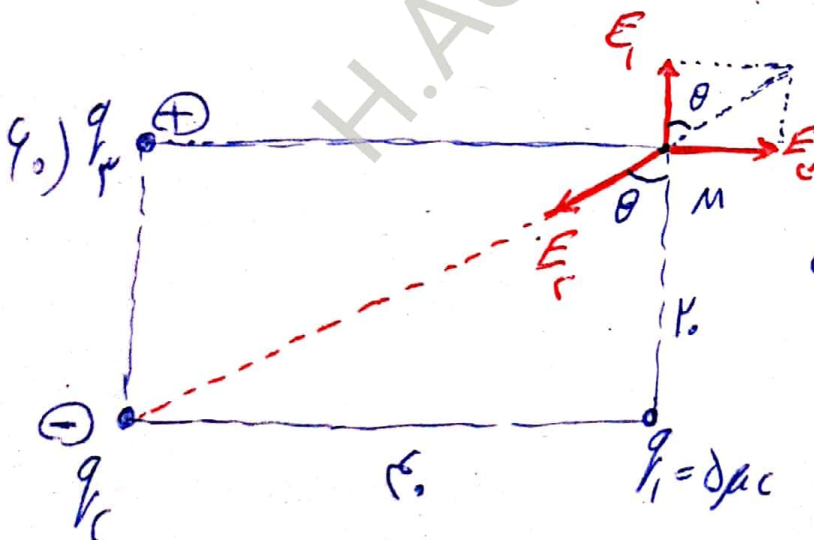
$$q_0 = n \times \frac{v}{f} \Rightarrow \boxed{n = 7} \quad \text{for } q_0 = 19.25 \text{ m}$$

$$\text{So, } \lambda = \frac{v_{\text{avg}}}{f} = \frac{v \times 4}{4.0} \text{ m} = 89 \text{ cm} \quad \text{DS}$$

$$d9) W_0 = 0.178 \text{ eV}$$

$$\lambda_0 = ? = \frac{h \cdot c}{W_0} = \frac{(6.626 \times 10^{-34} \text{ J s}) (3 \times 10^8 \text{ m/s})}{(0.178 \text{ eV})} = 1.1 \times 10^{-6} \text{ m}$$

$$\lambda_0 = 1.1 \text{ nm} \quad \text{DS}$$



$$\tan \theta = \frac{E_r}{E_c}$$

$$r = \frac{|q_2|}{|q_1|} \times \left(\frac{r_1}{r_2} \right)^r$$

$$r = \frac{|q_2|}{a} \times \left(\frac{b}{a} \right)^r \Rightarrow |q_2| = a \mu\text{C} \Rightarrow \frac{q_2}{a} = + \frac{a \mu\text{C}}{a}$$

① DS

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$$41) \left. \begin{array}{l} q_1 = q \\ q_2 = -q \\ r = r \end{array} \right\} F = k \frac{q q_1}{r^2} \quad \left. \begin{array}{l} F' = k \frac{q q_1}{r^2} \\ F = F' \end{array} \right\} \frac{F'}{F} = 1$$

$$\left\{ \begin{array}{l} q'_1 = -3q \\ q'_2 = q + (-3q) = -2q \\ r' = r \end{array} \right\} F' = k \frac{q q_1}{r^2} \quad \text{①}$$

42) در حالت اول: $V = I \times R = I \times 3$

در حالت دوم: $V' = I' \times R_{eq} = I' \times 5$

$$V' = \frac{1}{2} V \Rightarrow I' \times 5 = \frac{1}{2} \times I \times 3 \Rightarrow \frac{5 \times I'}{1+5} = \frac{1}{2} \times \frac{3}{1+5} \times I$$

$$\Rightarrow V = 3 \Omega \quad \text{②}$$

$$43) \left. \begin{array}{l} 12 \times I_1 = 3 \times I \Rightarrow I = 4 I_1 \\ I = I_1 + I_2 \end{array} \right\} I_1 = I_2 \Rightarrow R = 15 \Omega$$

$$\Rightarrow R_{eq} = 4 + 4 + 3 = 11 \Omega$$

$$I = \frac{12}{11 + 3} = \frac{3}{4} A$$

$$V = \mathcal{E} - I \cdot r$$

$$\hookrightarrow V = I \cdot R_{eq}$$

$$= \frac{3}{4} \times 11 = 8.25 V$$



✓

98) (C) ✓

99) A: ⊗
B: ⊙
C: ⊙

(D) ✓

99) (C) ✓

99) (C) ✓

$$91) \quad \vec{E} = -N \frac{\Delta \phi}{\Delta t} \Rightarrow |\vec{E}| = + N \cdot A \cos \theta \cdot \left| \frac{\Delta B}{\Delta t} \right|$$

$$\Rightarrow 1/2 = 0.01 \times A \times 1 \times 1 \Rightarrow A = \frac{1}{0.01} \text{ m}^2 = 100 \text{ m}^2$$

(C) ✓

$$99) \quad \frac{L_A}{L_B} = \frac{m_A}{m_B} \times \frac{V_B}{V_A} = \frac{m_A}{m_B} \times \left(\frac{r_B}{r_A} \right)^2 = \frac{1}{1} \times \left(\frac{r_B}{\frac{1}{2} r_B} \right)^2 = \frac{1}{1} \times \frac{4}{1} = 4$$

$$\frac{L_A}{L_B} = \frac{4}{1} \Rightarrow \frac{L_A - L_B}{L_B} = \frac{4 - 1}{1} = \frac{3}{1} = 3 \times 100\%$$

$$\approx 300\%$$

(D) ✓

✓

$$v.) \quad P = P_0 + \rho \cdot g \cdot h$$

$$P - P_0 = \rho \cdot g \cdot h \Rightarrow 1.5 \times 10^5 = \rho \times 10 \times 1.5$$

$$\rho = \frac{1.5}{10} = 1.5 \times 10^3 \text{ kg/m}^3 = 1.5 \frac{\text{g}}{\text{cm}^3}$$

$$P_g = P - P_0 = \rho \cdot g \cdot h = 1.5 \times 10^3 \times 10 \times 1 = 15000 \text{ Pa}$$

③

$$vi.) \quad P_A + \rho_{\text{Hg}} \times g \times r = P_0 + \rho_{\text{Hg}} \times g \times r$$

$$P_A - P_0 = \rho_{\text{Hg}} \times g \times r - \rho_{\text{Hg}} \times g \times r$$

$$= 13.6 \times 10^3 \times 10 \times r - 10 \times 10^3 \times 10 \times r = 10^5 (1.36 - 1)$$

$$= 44 \times 10^4 = 44 \text{ kPa} \quad \text{①}$$

$$vc.) \quad m_A = m_B$$

⑤

✓ درست (اف)

✗ غلط (ب)

✓ درست (ج)

✗ غلط (د)

9.4)

$$13) \Delta V = \beta \times V_i \times \Delta T$$

$$A \times \Delta h = \beta \times A \times h_i \times \Delta T$$

$$1.8 = 1.8 \times 10^{-5} \times d \times \Delta T \Rightarrow \Delta T = 1.1 \times 10^5 \Rightarrow$$

$$T_f - T_c = 1.1 \times 10^5 \Rightarrow T_c = 1.1 \times 10^5 \Rightarrow Q_c = 1.1 \times 10^5$$

$$F = \frac{9}{8} \times 1.8 + 1.8 = 1.5^\circ F$$

$$14) T_1 = \frac{P_1 \cdot V_1}{nR} \quad T_2 = \frac{P_2 \cdot V_2}{nR} = \frac{\frac{1}{2} P_1 \times 2V_1}{nR} = \frac{1}{2} T_1$$

$$\Delta T > 0 \Rightarrow \Delta U > 0 \Rightarrow Q + W > 0$$

15) 