

نوین کنکور

کنکور

امتحان نهایی

**نوین کنکور
شرط لازم و کافی
برای موفقیت**

novinkonkor.com

ص ۱۱

حل سترجی لوالا فیزک سگور ایسٹ ریسی تیر ۱۴۰۳

۴۱) سترجی ۵

۴۲) سترجی ۳

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

۴۴) سترجی ۳

$$۴۵) \left. \begin{aligned} q_1 \epsilon x_1^{-2} &= \frac{k |q_1| |q_2|}{r^2} \\ q_1 &= 8 \mu\text{C} = q \\ q_2 &= 4 \mu\text{C} \\ E_1 &= k \frac{|q_1|}{(2r)^2} = k \frac{|q_1|}{4r^2} \end{aligned} \right\} \begin{aligned} \frac{E_1}{q_1 \epsilon x_1^{-2}} &= \frac{1}{\epsilon} \\ E_1 &= \frac{1,4 x_1^{-2}}{\epsilon x_1^{-4}} = \epsilon x_1^2 \text{ N/C} \end{aligned}$$

سترجی ۱

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

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

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

سترجی ۵

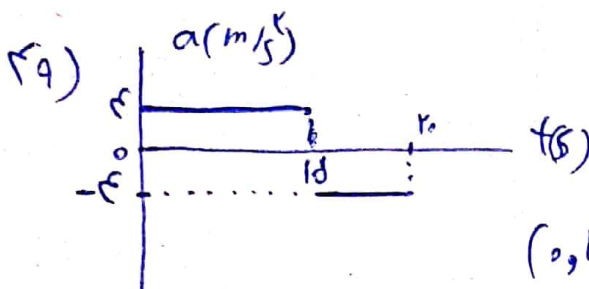
۲۰

۲۷) (۴) نرسه

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

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

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



$$\Delta V = \int_{(a-t)}^{} = S_1 + S_2 = 40 + (-20) = 20 m/s$$

$$(0, 1) S_1 \quad a_{av} = \frac{\Delta V}{\Delta t} = \frac{20}{20} = 1 m/s^2 \quad (۲) \quad \text{✓}$$

$$۳۰) t = 10s \Rightarrow v_B = v_A = 10 m/s \quad a_B = 1 m/s^2$$

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

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

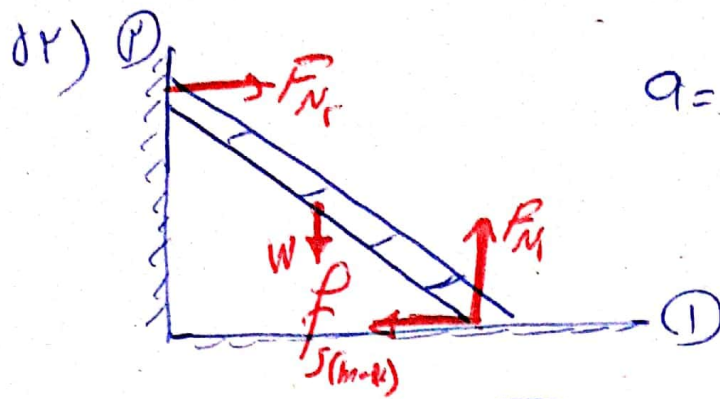
$$x_{0B} - x_{0A} = 10 + 10 = 20m$$

(۳) ✓

۳۱)

$$\left. \begin{aligned} 10 \\ 20 \\ 30 \\ 40 \end{aligned} \right\} 10s$$

$$|v_{av}| = \frac{|\Delta y|}{\Delta t} = \frac{10}{2} = 5 m/s \quad (۴) \quad \text{✓}$$



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

$$\begin{cases} F_N = f_s(\text{max}) \\ F_N = W = \epsilon_0 N \end{cases}$$

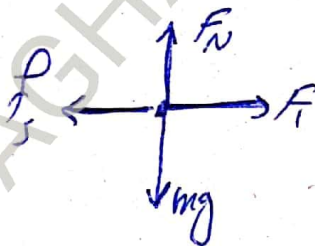
$$f_R = \sqrt{F_N^2 + f_s(\text{max})^2} = \sqrt{N} \sqrt{1 + \mu_s^2}$$

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

$$14 = 14(1 + \mu_s^2) \Rightarrow \mu_s = 1.0$$

(P) ✓

83) (b) (g):

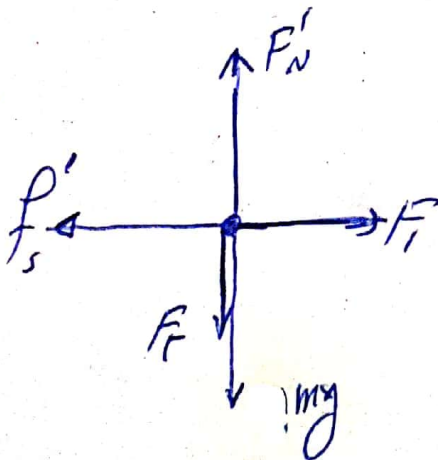


$$f_s = F = \epsilon_0 N$$

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

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

(b) (g):



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

$$F'_N = F + mg = \epsilon_0 + 10 = 15\text{ N}$$

$$f'_R = \sqrt{15^2 + 5^2} = 5\sqrt{10}\text{ N}$$

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

(P) ✓

$$r \frac{dm}{dr} = -\gamma(r) \rho$$

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

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

$$m \times a = -\frac{11}{8} \quad \boxed{a = \text{const.}}$$

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

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

$$\frac{V_A}{V_B} = \sqrt{\frac{r_B}{r_A}} \Rightarrow \frac{r_B}{r_A} = 4$$

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

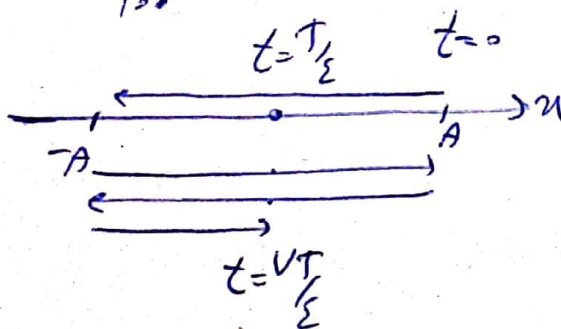
$$T = 2\pi \sqrt{\frac{r^3}{GM_e}}$$

$$\frac{T_A}{T_B} = \sqrt{\left(\frac{r_A}{r_B}\right)^3} = \sqrt{\left(\frac{1}{4}\right)^3} = \frac{1}{8}$$

$$89) \quad T = \frac{2\pi}{\omega} = \frac{2\pi}{\omega} \text{ s} \quad \left. \begin{array}{l} \frac{t}{T} = \frac{V}{\lambda} \Rightarrow t = \frac{V}{\lambda} T \end{array} \right\}$$

$$t = \frac{V \lambda}{\omega}$$

معبر-فر



$$|V| = V_{\max} = A \cdot \omega = 1 \times 2 \times 10 = 2 \text{ m/s}$$

$$V = + 2 \text{ m/s}$$

$$90) \quad \mu = \frac{m}{L} = \frac{1}{1} = 1 \text{ kg/m}$$

$$V = \sqrt{\frac{F}{\mu}} = \sqrt{\frac{1}{1}} = 1 \text{ m/s}$$

$$\lambda = \frac{v}{f} = \frac{1}{1} = 1 \text{ m}$$

do

$$d1) \left. \begin{array}{l} v = 11.0 \text{ m/s} \\ f = 4.42 \end{array} \right\} \lambda = \frac{v}{f} \Rightarrow \lambda = \frac{11.0}{4.42} = \frac{1}{10} \text{ m} = 10 \text{ cm}$$

$$L = 1.2 \text{ m} \quad L = n \frac{\lambda}{r} \Rightarrow$$

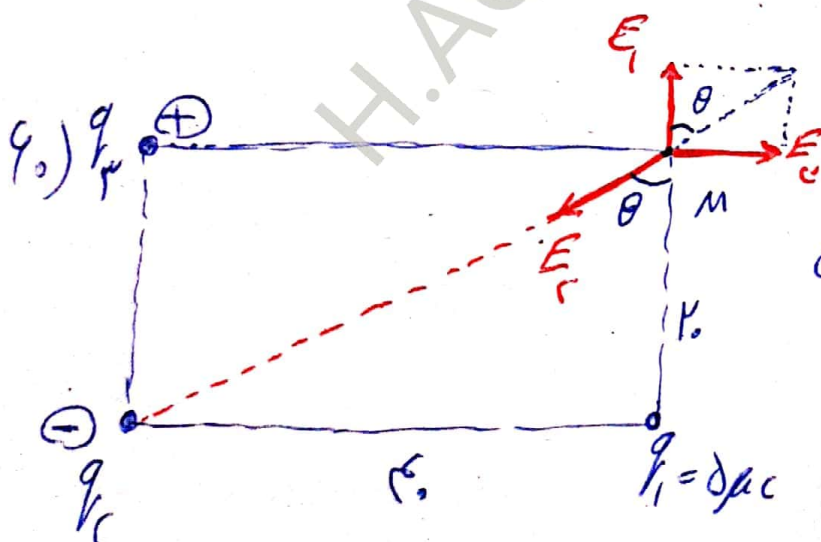
$$q_0 = n \times \frac{r}{r} \Rightarrow \boxed{n=r}$$

$$\text{So, } \lambda = \frac{v_{\text{light}}}{f} = \frac{3 \times 10^8}{4.42} \text{ m} = 69 \text{ cm} \quad \textcircled{P}$$

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

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

$$\lambda_0 = 1.1 \mu\text{m} \quad \textcircled{P}$$



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

$$r = \frac{|q_2|}{|q_1|} \times \left(\frac{r_1}{r_0} \right)^r$$

$$r = \frac{|q_2|}{8} \times \left(\frac{r_1}{r_0} \right)^r \Rightarrow |q_2| = 8 \mu\text{C} \Rightarrow q_2 = +8 \mu\text{C}$$

$\textcircled{P}$

40

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

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

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

دوائر دوم : $V' = I' \times R_{eq} = I' \times 7$

$$V' = \frac{1}{2} V \Rightarrow I' \times 7 = \frac{1}{2} \times I \times 3 \Rightarrow \frac{I'}{I} = \frac{3}{14} = \frac{r}{r+7} \Rightarrow I' = \frac{r}{r+7} I$$

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

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

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

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

$$\begin{aligned} V &= \mathcal{E} - I \cdot r \\ \mathcal{E} &= V + I \cdot R_{eq} \\ &= \frac{3}{4} \times 11 = 8.25 V \end{aligned}$$

③

۷۳

۹۵) (۴) ✓

۹۶) A: ⊗
B: ⊙
C: ⊙

(۱) ✓

۹۷) (۴) ✓

۹۸) (۴) ✓

$$۹۹) \quad \vec{E} = -N \frac{\Delta \phi}{\Delta t} \Rightarrow |\vec{E}| = + N \cdot A \cdot \cos \theta \cdot \left| \frac{\Delta B}{\Delta t} \right|$$

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

(۳) ✓

$$۹۹) \quad \frac{L_A}{L_B} = \frac{m_A}{m_B} \times \frac{V_B}{V_A} = \frac{m_A}{m_B} \times \left(\frac{r_B}{r_A} \right)^3 = \frac{1}{1} \times \left(\frac{r_B}{\frac{1}{2} r_B} \right)^3 = \frac{1}{1} \times \frac{9}{1}$$

$$\frac{L_A}{L_B} = \frac{9}{1} \Rightarrow \frac{L_A - L_B}{L_B} = \frac{9 - 1}{1} = \frac{8}{1} \times 100\%$$

$$\approx 111.0\%$$

(۲) ✓

۱۲

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

$$P - P_0 = \rho \cdot g \cdot h \Rightarrow 1.5 \times 10^5 = \rho \times 10 \times 1.4$$

$$\rho = \frac{1.5}{1.4} = 1.07 \times 10^3 \text{ kg/m}^3 = 1.07 \text{ g/cm}^3$$

$$P_g = P - P_0 = \rho \cdot g \cdot h = 1.07 \times 10^3 \times 10 \times 1 = 10700 \text{ Pa}$$

دست

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

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

$$= 13.6 \times 10^3 \times 10 \times r - 1.2 \times 10^3 \times 10 \times r = 10^5 (1.14 - 0.12)$$

$$= 99 \times 10^3 = 99 \text{ kPa} \quad \text{دست}$$

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

دست

✓ درست (اف)

نادرست (ب)

✓ درست (ج)

نادرست (د)

9e)

$$v3) \Delta V = \beta \times V_i \times \Delta T$$

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

$$1/10 = 1.0 \times 10^{-3} \times \Delta T \Rightarrow \Delta T = 0.1 \Rightarrow$$

$$T_f - T_c = 0.1 \Rightarrow T_c = 11.1 \Rightarrow Q_c = 1.0 \times 10^3$$

$$F = \frac{9}{8} \times 1.0 + 1.0 = 1.5 \text{ F}$$

$$v5) T_1 = \frac{P_1 \cdot V_1}{nR} \quad T_2 = \frac{P_2 \cdot V_2}{nR} = \frac{\frac{1}{16} P_1 \times \Delta V_1}{nR} = \frac{\Delta}{\varepsilon} T_1$$

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

$$v8) \text{ (Diagram) }$$

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