

نوین کنکور

کنکور

امتحان نهایی

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

novinkonkor.com

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مدرس فیزیک: حسن آقا جلیلو

باسم تعالیٰ سوالات فیزیک
نگو تیر ۱۴۰۲ رشته تجربی

«بسم خدا»

۴۶) ۲

$$۴۷) E = hf = h \times \frac{c}{\lambda} \Rightarrow \frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1} = \frac{3}{4} \quad (۳)$$

$\lambda_1 = 60 \text{ nm}$
 $\lambda_2 = 40 \text{ nm}$

$$۴۸) \begin{matrix} \vec{v}_0 \\ \vec{v}_0 = 0 \end{matrix} \xrightarrow{\vec{v}_0} \vec{v}_0 \quad f_0 < f_5 \Rightarrow \quad (۱)$$

$\lambda_0 = \text{con.}$

۴۹) ۴

$$۵۰) \Delta x = \sum_{(v-t)} \left(\left(\frac{1+1}{2} \right) \text{min} \times \frac{1}{2} \left(\frac{\text{km}}{\frac{1}{2} \text{min}} \right) = 11 \text{ km} \right) - \left(\frac{1 \text{min} \times \frac{1}{2} \left(\frac{\text{km}}{\frac{1}{2} \text{min}} \right)}{2} \right)$$

$$\Delta x = 10.75 \text{ km} \quad (۲)$$

$$۵۱) \left. \begin{matrix} x_0 = 0 \\ v_0 = 0 \\ a = \text{con.} \end{matrix} \right\} \Rightarrow \left. \begin{matrix} v = at \\ \Delta x = \frac{1}{2} at^2 \end{matrix} \right\} \Rightarrow \left. \begin{matrix} 11 \text{ km} = \frac{1}{2} a \times 1 \text{ s}^2 \\ t = 0.5 \text{ s} \Rightarrow v = 10 \text{ m/s} \end{matrix} \right\} \Rightarrow (۳)$$

$(0.5, 1) \text{ s} : \Delta x = \frac{1}{2} at^2 + v_0 t = \frac{1}{2} \times 20 \times 1^2 + 10 \times 1 = 15 \text{ m} \checkmark$

(۳)

$$۵۲) (0, 1) \text{ s} : x_0 \Rightarrow v_{av} = ? = \frac{\Delta x}{\Delta t} = \frac{0 - 11}{1 - 0} = -11 \text{ m/s}$$

$$|v_{av}| = 11 \text{ m/s} \quad (۳)$$

۵۳)

$$\left. \begin{matrix} x_0 = 0 \\ v_0 = 10 \text{ m/s} \\ a = \frac{1}{2} \text{ m/s}^2 \end{matrix} \right\}$$

12)

$$\text{د ۱۳)} \quad \begin{cases} x_{0A} = -1.00 \text{ m} & x_{0B} = +1.00 \text{ m} \\ v_{0A} = -1.0 \text{ m/s} & v_{0B} = 1.0 \text{ m/s} \\ a_A = \frac{1}{5} \text{ m/s}^2 & t) 1.5 \Rightarrow v_B = 0 \Rightarrow x_A = -1.40 \text{ m} \end{cases}$$

$$A: x = \frac{1}{2} a t^2 + v_0 t + x_0$$

$$-1.40 = \frac{1}{2} \times \frac{1}{5} t^2 - 1.0 t - 1.00$$

$$-1.40 = \frac{t^2}{10} - 1.0 t \Rightarrow t^2 - 10t + 14 = 0 \Rightarrow (t - 3)(t - 7) = 0 \Rightarrow \begin{cases} t_1 = 3 \\ t_2 = 7 \end{cases} \checkmark$$

$$a_B = \frac{0 - 1.0}{1.5 - 0} = -\frac{1}{1.5} \text{ m/s}^2 \quad x_B = \frac{1}{2} a t^2 + v_0 t + x_{0B}$$

$$t_1 = 1.5 \Rightarrow x_B = \frac{1}{2} \left(-\frac{1}{1.5}\right) \times 1.5^2 + 1.0 \times 1.5 + 1.00 = -1.25 + 1.50 + 1.00 = 1.25 \text{ m}$$

$$B, A \text{ separation} = x_B - x_A = 1.25 - (-1.40) = 2.65 \quad (1)$$

$$\text{د ۱۴)} \quad r = 10.1 \Rightarrow a = 0 \Rightarrow f_k = F = 91 \text{ N}$$

$$F_N = W - F_r = 100 - F_r \quad F_r: \text{افزایش وزن}$$

$$f_R = \sqrt{f_k^2 + F_N^2}$$

$$F_1 \text{ به جسم } \Rightarrow \tan \theta = \frac{F_N}{f_k} = \frac{1}{1.4} = \cot \theta \quad (15)$$

$$\text{د ۱۵)} \quad f_{s(\max)} = \mu_s \times F_N = \mu_s \times mg = 0.5 \times 100 = 50 \text{ N}$$

$$F = 1.0 t \quad (t = 5 \Rightarrow F = 50 \text{ N}) = f_{s(\max)}$$

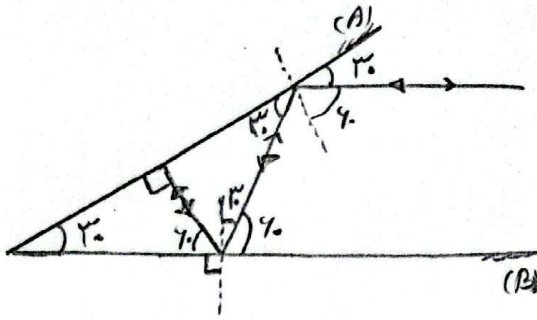
$$t) 5 \Rightarrow f_{\text{static}} = f_k = \cot \theta = 50 \text{ N} \quad (16)$$

$$\text{د ۱۶)} \quad \frac{W'}{W} = \frac{mg'}{mg} = \frac{M'}{M_e} \times \left(\frac{R_e}{R'}\right)^2 = \frac{1 M_e}{M_e} \times \left(\frac{R_e}{1 R_e}\right)^2 = \frac{1}{5} \quad (17)$$

$$g = \frac{G \times M}{R^2}$$

۱۳)

در)



۱۴)

$$d\lambda) \quad \omega = \sqrt{\frac{k}{m}} = \sqrt{\frac{F_0}{r}} = 10 \text{ rad/s}$$

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

$$v = 5 \text{ cm/s} = \frac{1}{2} V_{max} \Rightarrow |x| = \frac{v}{\omega} A = \frac{5}{10} \times 1 = 0.5 \text{ cm}$$

$$U = \frac{1}{2} k x^2 = \frac{1}{2} \times 10 \times (0.5)^2 = 1.25 \text{ J} \quad (1)$$

$$d9) \quad V_{max} = A \cdot \omega = A \times \frac{2\pi}{T}$$

$$T = \frac{A \times 2\pi}{V_{max}} = \frac{1 \times 2\pi}{10} = 0.628 \text{ s} \quad (2)$$

$$9.) \quad \left. \begin{array}{l} v = \sqrt{\frac{E}{\mu}} \\ F = \text{افزایش} \\ T = \text{co h.} \end{array} \right\} \left. \begin{array}{l} \lambda = v \times T \\ \text{افزایش} \end{array} \right\} \Rightarrow (3)$$

$$41) \quad E = p \times \Delta t \Rightarrow h \cdot \frac{h \cdot c}{\lambda} = p \times \Delta t$$

$$\Rightarrow h \times \frac{4.4 \times 10^{-19} \times 3 \times 10^8}{2.4 \times 10^{-10}} = 4.4 \times 10^{-19} \times 4$$

$$h \times 10^{-19} = 12 \Rightarrow h = 1.2 \times 10^{-18} \text{ J} \quad (4)$$

15

$$4r) \quad h' \leq d \Rightarrow \begin{cases} \lambda_1 = \lambda_{max} \Rightarrow \frac{1}{\lambda_1} = R \left(\frac{1}{r_0} - \frac{1}{r_4} \right) \Rightarrow \lambda_1 = \frac{r_0 r_4}{11R} \\ h=4 \\ \frac{1}{\lambda} = R \left(\frac{1}{\lambda_1 r} - \frac{1}{h^2} \right) \end{cases} \begin{cases} \lambda_r = \lambda_{min} \Rightarrow \lambda_r = \frac{h^2 r}{R} = \frac{r_0}{R} \\ h = \infty \end{cases}$$

$$\frac{\lambda_1}{\lambda_r} = \frac{r_4}{11} \quad (1)$$

4r) $\mu = 1.5 \times 10^{-3}$: $E = W$ $m = V_d \rho_g r = V_d \times 10^{-9} \text{ kg}$
 $W = mg = V_d \times 10^{-9} \times 10 = V_d \times 10^{-8} \text{ N}$

$$\frac{q_0}{K_x} \frac{|q_1| |q_2|}{r^2} = V_d \times 10^{-8}$$

$$V_d \times 10^{-8} = V_d \times 10^{-8} \Rightarrow r = 10^{-10} \text{ m}$$

$$\frac{q_0}{e} = \frac{V_d \times 10^{-8} \times 10^{-10}}{1.5 \times 10^{-19} \text{ C}} = \frac{V_d}{1.5} \times 10^{-18} = \frac{V_d}{1.5} \times 10^{-18}$$

$$n = 9.1 \times 10^{-18} \quad (2)$$

4c) $F_{1r} = 1 \times 10^{-18} \text{ N}$ $\rightarrow$ $F_{1r} = 4 \times 10^{-18} \text{ N}$ $\uparrow$
 $q_1 > 0$ $q_2 < 0$

$$\frac{q_1}{q_2} < 0 \quad F_{1r} = k \frac{|q_1| |q_2|}{r^2} \quad , \quad F_{2r} = \frac{k |q_2| |q_1|}{r^2}$$

$$\frac{F_{1r}}{F_{2r}} = \frac{|q_1|}{|q_2|} \times \left(\frac{r_{2r}}{r_{1r}} \right)^2 \Rightarrow \frac{1}{4} = \frac{|q_1|}{|q_2|} \times 1 \Rightarrow \frac{q_2}{q_1} = \frac{1}{4}$$

(3)

$$4d) \left. \begin{aligned} L_A &= L_B \\ R_A &= R_B \\ I_A &= r I_B \end{aligned} \right\} \quad \int_A \frac{L_A}{A_A} = \int_B \frac{L_B}{A_B} \Rightarrow A_A = r A_B$$

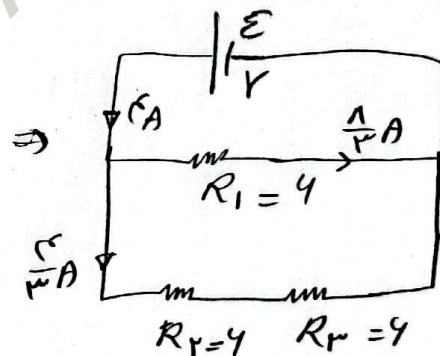
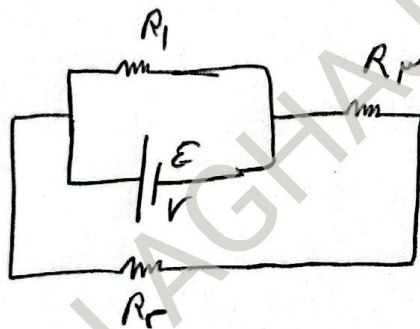
$$\int_B \frac{I_A}{A_B} = \frac{I_A \times V_A}{I_B \times V_B} = \frac{I_B \times A_A \times L_A}{I_B \times A_B \times L_B} = r \times r = r^2$$

(2)

$$I = \frac{E}{R_{eq} + r} = \frac{V_0}{9 + 1} = 1A$$

$$I_1 = I_7 = 1A$$

$$P_{(R)} = R \cdot I_r = 4 \times 1 = 4W$$



$$\Rightarrow R_{eq} = \frac{V_{11} r}{I_1} = (2) \quad I = \frac{V_0}{R_{t1}} = (A)$$

$$P'_R = R_c \times \frac{I_c}{c} = 4 \times \left(\frac{1}{4} \right) = 4 \times \frac{1}{4} = \frac{1}{1} W$$

$$\rho' - \rho = \frac{w_r}{\mu} - \gamma = \frac{1}{\mu} w \quad (\mu)$$

9)

$$9V) \quad R_A = 4 \Omega$$

$$R_V = 110 \Omega$$

$$31) \quad I(R_V + R_A) = V \quad \checkmark$$

$$1/9(R_V + 4) = V \Rightarrow R_V = 110 \Omega \quad \checkmark$$

$$3) \quad I_V R_V = V \quad \checkmark$$

$$I_V \times R_V = V \Rightarrow I_V \times 110 = V \quad \checkmark$$

$$I_V = 1 \text{ A}$$

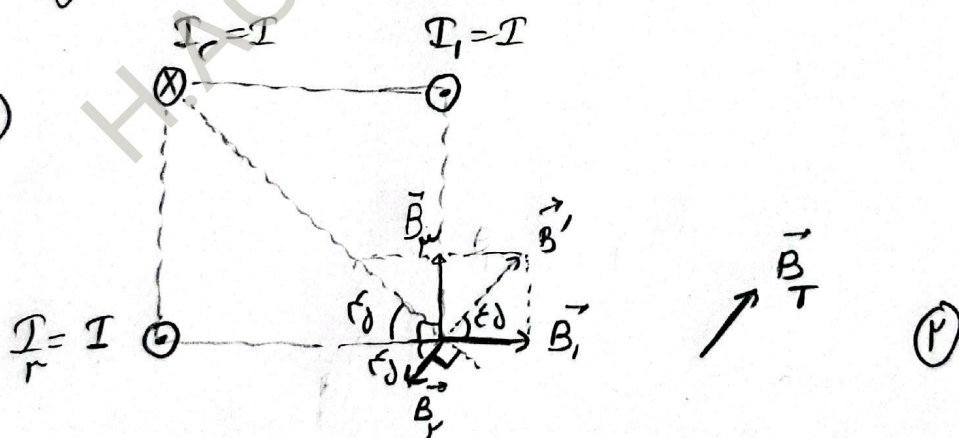
$$I_r + I_V = 1 \text{ A} \Rightarrow I_r = 1 \text{ A} - 1 \text{ A} = 0$$

$$I_c = 1 \text{ A} = I_V$$

$$R_r = R_V = 110 \Omega \quad (3)$$

9V) ①

99)



$$V_1) \quad \bar{E} = -N \frac{\Delta \Phi}{\Delta t} = -N \frac{\Delta (B \cdot A \cdot \cos \theta)}{\Delta t} = -N \cdot A \cdot \cos \theta \times \frac{\Delta B}{\Delta t}$$

$$\bar{E} = -100 \times d \times l \times \cos \theta \times \frac{1 \text{ T} - 0}{1 \text{ s}} = + 10 \text{ V}$$

$$I = \frac{|\bar{E}|}{R} = \frac{10}{1} = 10 \text{ A} \quad (3)$$

IV

$$b = 2a$$

V1)

$$V = \frac{4}{3} \pi (b^3 - a^3) = \frac{4}{3} \pi \times Va^3$$

$$m = \rho \times V \Rightarrow \rho_{x1} \cdot \frac{4}{3} \pi a^3 = \frac{4}{3} \pi \times \rho \times Va^3$$

$$\rho_{x1} \cdot a^3 = \rho \cdot a^3 \Rightarrow a^3 = 10^{-4}$$

$$a = 10^{-4} \text{ m} = 1 \text{ cm} \quad \textcircled{A}$$

V2)

$$P_{g05} + \rho_r \cdot g \cdot h_r = P_0 + \rho_l \cdot g \cdot h_l$$

$$P_{g05} - P_0 = \rho_l \cdot g \cdot h_l - \rho_r \cdot g \cdot h_r$$

$$\rho_r \cdot h_r = \rho_{Hg} \cdot h_{Hg}$$

$$\rho_l \cdot h_l = \rho_{Hg} \cdot h_{Hg}$$

$$1,04 \times 10^4 = 13,6 \times h_{Hg}$$

$$1,5 \times 10^4 = 13,6 \times h_{Hg}$$

$$h_{Hg} = 795 \text{ cm} = 7,95 \text{ mm}$$

$$h_{Hg} \approx 1,57 \text{ cm} = 15,7 \text{ mm}$$

$$P_g = P_{g05} - P_0 = -15 \text{ mmHg} \quad \textcircled{1}$$

$$V3) \quad W_T = \Delta k = \frac{1}{2} m (v^2 - v_0^2) = \frac{1}{2} \times 10 (15^2 - 0^2) = 1125 \text{ J}$$

$$W_T = 1125 \text{ J} \quad \textcircled{2}$$

Ⓜ

Vr) $E_i = E_f$

$$K_i + U_i = K_f + U_f \Rightarrow \frac{1}{2} m v_i^2 + 0 = \frac{1}{2} m v_f^2 + m \cdot g \cdot h_f$$

$$v_i^2 = v_f^2 + 2gh_f$$

$$v_i^2 = v_f^2 + 2gh_f \Rightarrow h_f = 1.71 \text{ m} \quad \textcircled{2}$$

Vd)

$$Q = m \cdot L_v \Rightarrow \rho_x \Delta t = m \cdot L_v$$

$$\rho_{x10} \Delta t = \rho_x 2289 \times 10^3$$

$$\Delta t = 2289 \text{ s} = \frac{2289}{60} \text{ min} = 38.15 \text{ min} \quad \textcircled{1}$$

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