

نوین کنکور

کنکور

امتحان نهایی

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

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۱۱

۴۱) ۴

$$۴۲) \rho = \frac{W}{\Delta t} \Rightarrow \rho = \frac{m \cdot g \cdot h}{\Delta t} \Rightarrow \rho = \frac{40 \times 10 \times (h \times \frac{1}{4})}{40} \Rightarrow h = 120 \quad (۳)$$

$$۴۳) r_d \times \frac{\pi}{r} = \frac{r \pi}{r} \quad (۱)$$

۴۴) ۲

$$۴۵) \frac{k_f}{k_i} = \frac{m_f}{m_i} \times \left(\frac{v_f}{v_i} \right)^2 \Rightarrow \frac{2}{4} = \frac{m_f}{10} \times \left(\frac{4}{8} \right)^2 \Rightarrow m_f = 4 \text{ kg}$$

$$m_f - m_i = 4 - 10 = -6 \text{ kg} \quad (۳)$$

$$۴۶) v = \frac{r}{t} - 10$$

$$\begin{aligned} (0, 0) : v_{av} &= \frac{r}{t} \left(\frac{0+0}{1} \right) - 10 = \frac{-10}{1} = -10 \text{ m/s} \\ (1, 1) : v_{av}' &= \frac{r}{t} \left(\frac{1+0}{1} \right) - 10 = \frac{10}{1} = 10 \text{ m/s} \end{aligned} \quad \left. \vphantom{\begin{aligned} (0, 0) : v_{av} &= \frac{r}{t} \left(\frac{0+0}{1} \right) - 10 = \frac{-10}{1} = -10 \text{ m/s} \\ (1, 1) : v_{av}' &= \frac{r}{t} \left(\frac{1+0}{1} \right) - 10 = \frac{10}{1} = 10 \text{ m/s} \end{aligned}} \right\} \frac{v_{av}}{v_{av}'} = -1 \quad (۱)$$

$$۴۷) x = \frac{1}{2} a t^2 + v_0 t + r_0$$

$$\begin{cases} t=2s \Rightarrow 0 = 2a + 2v_0 + r_0 \\ t=0s \Rightarrow 0 = 120a + 0v_0 + r_0 \end{cases} \Rightarrow \begin{cases} a = 4 \text{ m/s}^2 \\ v_0 = -12 \text{ m/s} \end{cases}$$

$$v = at + v_0 = 4 \times 0 - 12 = -12 \text{ m/s} \quad (۴)$$

$$۴۸) \Delta y = -\frac{1}{2} g t^2$$

$$-12.1 = -\frac{1}{2} g t^2 \Rightarrow t = 1.5 \text{ s} \quad t=1.5 \Rightarrow \Delta y = -5 \text{ m}$$

$$-12.1 = -5 \quad \text{ارتفاع از سطح زمین} = 12.1 - 5 = 7.1 \text{ m} \quad (۱)$$

12

19)

$$x_A = x_B = 0$$

$$v_A = 1 \text{ m/s} \quad a_A = -1 \text{ m/s}^2$$

$$v_B = -1 \text{ m/s} \quad a_B = 1 \text{ m/s}^2$$

$$x_A = -t^2 + 1 \cdot t$$

$$x_B = \frac{1}{2} t^2 - 1 \cdot t$$

$$\text{B, Answer: } L = x_A - x_B = -\frac{1}{2} t^2 + 1 \cdot t$$

$$1 \Delta_0 = -\frac{1}{2} t^2 + 1 \cdot t \Rightarrow \Delta_0 = -\frac{1}{2} t^2 + 1 \cdot t \Rightarrow t = 1.5$$

$$L = x_B - x_A = \frac{1}{2} t^2 - 1 \cdot t$$

$$1 \Delta_0 = \frac{1}{2} t^2 - 1 \cdot t \Rightarrow \Delta_0 = \frac{1}{2} t^2 - 1 \cdot t \Rightarrow \begin{cases} t = 1.(\sqrt{2} + 1) \text{ s} \checkmark \\ t = 1.(\sqrt{2} - 1) \text{ s} \checkmark \end{cases}$$

12

$$d.) \Delta p = \sum_{(F-t)} = (8 \times 1) + (1 \times 1) + (4 \times 1) = 13 \text{ kg m/s}$$

$$\Rightarrow \Delta p = m \times \Delta v \Rightarrow 13 = 1 \Delta v \Rightarrow \Delta v = 13 \text{ m/s}$$

$$a_v = \frac{\Delta v}{\Delta t} = \frac{13}{1} = 13 \text{ m/s}^2 \quad (13)$$

d.) 12

$$d.) v = -gt + v_0 \Rightarrow v = -1 \cdot t \quad m = 1 \text{ kg}$$

$$p = mv = 1 \times (-1 \cdot t) = -1 \cdot t \quad (12)$$

$$d.) T = \frac{1 \pi}{1} = \frac{1 \pi}{1 \cdot \pi} = \frac{1}{1} \text{ s}$$

$$t = \frac{1}{1} \text{ s} = \frac{\Delta T}{f} = T + \frac{T}{2} \Rightarrow x = 0 \Rightarrow k = k_{\max} = \frac{1}{2} m \cdot \omega^2 A^2$$

$$\Rightarrow k = \frac{1}{2} \times \frac{1}{1} \times 1 \times \pi^2 \times 1 \times 1 = \frac{1}{2} \pi^2 \text{ mJ} \quad (12)$$

۱۳

$$\left. \begin{aligned} \text{د۴)} \quad |a| = a_{\max} &\Rightarrow \chi = \pm \theta \\ \text{حرکت نوسانی} \quad (a)_0 & \\ \{a\}_0 &\Rightarrow \chi < 0 \\ \chi < 0 & \end{aligned} \right\} \quad (1)$$

$$\text{د۵)} \quad \frac{3\lambda}{r} = r_m \Rightarrow \lambda = r_m \quad \lambda = \frac{c}{f} \Rightarrow r = \frac{r_m \lambda}{f} \Rightarrow f = 1.8 \times 10^8 \text{ Hz} \\ \Rightarrow f = 180 \text{ MHz} \quad (2)$$

$$\text{د۶)} \quad \lambda_A > \lambda_B \Rightarrow \hat{D}_A < \hat{D}_B \quad \hat{D} = \text{زاویه انحراف} \\ \text{از عمیق به رفیق} \quad \Rightarrow (3)$$

د۷) (۳)

$$\text{د۸)} \quad n' = f \quad \left| \begin{aligned} n' = f &\Rightarrow \frac{1}{\lambda} = R \left(\frac{1}{n'^2} - \frac{1}{n^2} \right) = R \times \frac{9}{14 \times r_D} \\ n = \infty & \end{aligned} \right. \quad \lambda_{\max} = \frac{14 \times r_D}{9R} \quad \left. \begin{aligned} \lambda_{\max} &= \frac{14 \times r_D}{9R} \\ \lambda_{\min} &= \frac{r_D}{9} \end{aligned} \right\} \quad (1)$$

$$\text{د۹)} \quad 1 + r_D = 1 + r + 1 + (N \times 1) \Rightarrow N = r \quad (4)$$

$$\text{۱۰)} \quad f = \frac{h\nu}{r} = \frac{1.6 \times 10^{-19} \text{ J}}{\frac{r}{r} \times r \times (1.6 \times 10^{-19} \text{ J})^2} = \frac{1.6 \times 10^{-19} \text{ J}}{r \times 1.6 \times 10^{-19} \text{ J} \times 1.6 \times 10^{-19} \text{ J}} = \frac{1}{r} \times 1.6 \times 10^{-19} \text{ J} \times 1.6 \times 10^{-19} \text{ J} \\ f = \frac{1}{r} \times 1.6 \times 10^{-19} \text{ J} \times 1.6 \times 10^{-19} \text{ J} \quad (5)$$

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91) (1)

$$\begin{aligned} 91) \quad V &= \text{con.} & Q &= C \times V \quad Q' = rQ \\ d' &= \frac{1}{r} d \Rightarrow C' = rC & & (2) \\ C &= k\epsilon_0 \frac{A}{d} \end{aligned}$$

92)

$$F_{lr} = F_{rr} \Rightarrow \frac{d_0}{d} = \frac{|q_r|}{r} \Rightarrow q_r = r \mu C \quad \text{Note: } q_r < 0 \Rightarrow q_r = -r \mu C \quad (3)$$

93) $V = \mathcal{E} - IR$

$P = V \times I = 9 \times 1 = 9 \text{ W}$

94) $D' = 0.99D$ $R = \rho \frac{L}{A} = \frac{\rho L}{\pi D^2} \Rightarrow \frac{R'}{R} = \left(\frac{D}{D'}\right)^2$

$V = \text{con.}$ $P = \frac{V^2}{R} \Rightarrow \frac{P'}{P} = \frac{R}{R'} = \left(\frac{D'}{D}\right)^2 = \left(\frac{0.99}{1}\right)^2$

$I = \text{con.}$

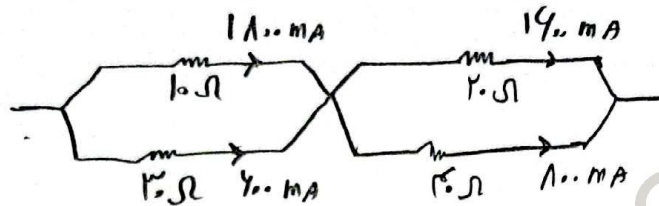
$\frac{P'}{P} \approx \frac{0.98}{1} \Rightarrow \frac{P' - P}{P} = \frac{-2}{100} = -2\% \quad (1)$

8

$$44) R_{eq} = \frac{3}{4} \Omega + \frac{4}{3} \Omega = \frac{25}{12} \Omega$$

$$I_T = \frac{\varepsilon}{R_{eq} + r} = \frac{d_0}{\frac{25}{12}} = \frac{12}{25} = 24 \mu A = 24 \cdot 10^{-6} A$$

$$I_{X1} = 24 \mu A \Rightarrow X = 4 \mu A, I_{X2} = 24 \mu A \Rightarrow X' = 10 \mu A$$



$$(3) \text{ (برطرف می‌شود)} = 20 \mu A$$

45) (4)

$$46) F = B \cdot L \cdot I \cdot \sin \alpha = 6 \times 10^{-3} \times 1 \times 2 \times \sin 90^\circ = 1.2 \times 10^{-2} N \quad (1)$$

47) (3)

$$48) |E| = B \cdot L \cdot v \Rightarrow |E_x| = |E_y| = |E_z| \quad (2)$$

$$49) D' = \frac{1}{4} D \Rightarrow A' = \frac{1}{4} A \quad \text{قطر متباعد: } D, \text{ قطر متباعد: } D'$$

$$A' \cdot v' = A \cdot v \Rightarrow \frac{v'}{v} = \frac{A}{A'} = \frac{4}{1} \Rightarrow \frac{v - v'}{v} = -\frac{3}{4} \quad (1)$$

$$50) P_{gas} + \rho \cdot g \cdot h = P_0$$

$$P_{gas} + 1000 \times 10 \times 0.1 = 101325$$

$$P_{gas} = 111325 Pa \quad (2)$$

(4)

$$\begin{aligned}
 V^{(3)} \quad C_A &= \frac{Q}{m \cdot \Delta \theta} = \frac{1100}{4 \times 1} = 275 \\
 C_B &= \frac{100}{1 \times 1} = 100 \text{ J/kg}^\circ\text{C} \\
 C_C &= \frac{100}{10 \times 1} = 10
 \end{aligned}
 \left. \begin{array}{l} C_B > C_C > C_A \\ \textcircled{3} \end{array} \right\}$$

V⁽⁴⁾ $\textcircled{4}$

$$\begin{aligned}
 V_D) \quad T &= 100^\circ\text{C} \\
 h &= 100^\circ\text{C}
 \end{aligned}
 \Rightarrow \frac{P_r}{T_r} = \frac{P_i}{T_i} \Rightarrow \frac{10 + V_D}{T_r} = \frac{V_D}{100}$$

$$T_r = \frac{100 \times 10}{V_D} = 1000$$

$$Q_c = 1000 - 100 = 900^\circ\text{C} \quad \textcircled{4}$$

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