

نوین کنکور

کنکور

امتحان نهایی

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

novinkonkor.com

برای گزینه (۱۱): همجهت بودن شتاب و سرعت:

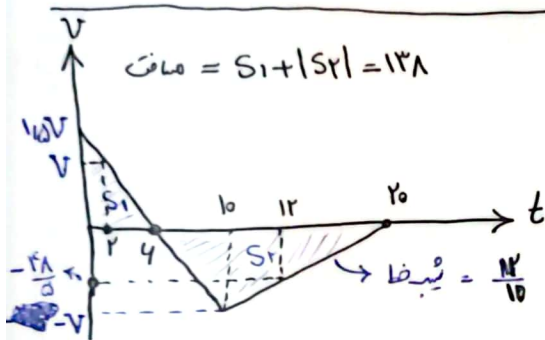
$$215 + (25 - 1715) + 215 = 1215$$

$$\Delta x = (10 \times 5) + \frac{1}{2}(215)(5) - \frac{(20+5)(10)}{2} + \frac{1}{2}(215)(5)$$

$$= 50 - 1875 + 1215 = -125 \text{ m}$$

$$t = (1715 - 215) + 215 = 1715$$

$$\begin{aligned} \text{مسافت} &= \frac{1}{2}(215)(5) + \frac{(15+10)(5)}{2} \\ &+ \frac{(20+5)(10)}{2} + \frac{1}{2}(215)(5) \\ &= 1215 + 425 + 1875 = 3515 \text{ m} \end{aligned}$$

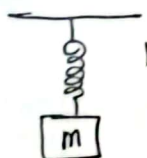


$$\text{مسافت} = S_1 + |S_2| + S_3 = 138$$

$$\Rightarrow \frac{1}{2}(4)(10) + \frac{1}{2}(6)(-10) + \frac{1}{2}(8)(10) = 138$$

$$\Rightarrow 20 - 30 + 40 = 138 \Rightarrow V = 12 \text{ m/s}$$

$$\Rightarrow \bar{a} = \frac{-9.4 - 12}{12 - 2} \Rightarrow |\bar{a}| = 2.14$$



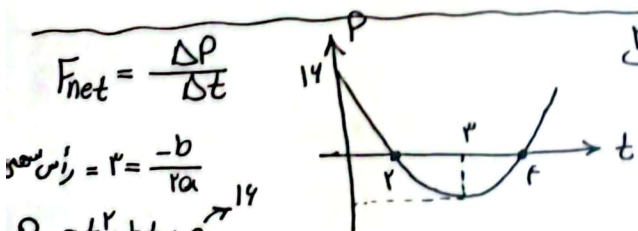
$$k \Delta L = mg \Rightarrow k = \frac{mg}{\Delta L}$$



$$k \Delta L - F_k = 0$$

$$0.2k = 12 \text{ Mg}$$

$$\Rightarrow \frac{0.12 \text{ Mg}}{mg} = \frac{0.2k}{0.1k} \Rightarrow \frac{M}{m} = 1$$



$$F_{\text{net}} = \frac{\Delta P}{\Delta t}$$

$$P = at^2 + bt + c$$

$$P = k(t-r)(t-f)$$

$$\Rightarrow P = k(t-r)(t-f) \xrightarrow{t=0} k = 2 \Rightarrow P = 2(t-r)(t-f)$$

$$\begin{aligned} \rightarrow t = 2 \rightarrow P = -2 \\ t = 4 \rightarrow P = 4 \end{aligned} \Rightarrow F_{\text{net}} = \frac{4+2}{4-2} = \frac{1}{2} = \frac{1}{2}$$

با سطح شیب ۴۵ درجه و شتاب ۱۰

$${}^Z_2 X \rightarrow {}^r_2 \alpha + {}^0_{-1} e + {}^0_{+1} \beta + {}^{A'}_{Z'} Y$$

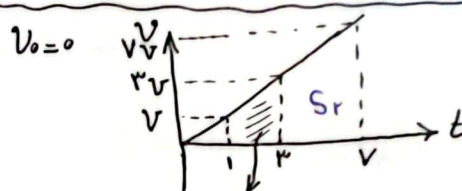
$${}^Z_2 X = {}^r_2 \alpha + {}^{A'}_{Z'} Y \rightarrow A' = Z - r \Rightarrow N' = A' - Z' = Z - r$$

$$Z = r + Z' \rightarrow Z' = Z - r \rightarrow N' - Z' = Z - r - Z + r = 0$$

$$W = 20 \text{ m/s} \rightarrow \text{در دو طرف جهت همسان}$$

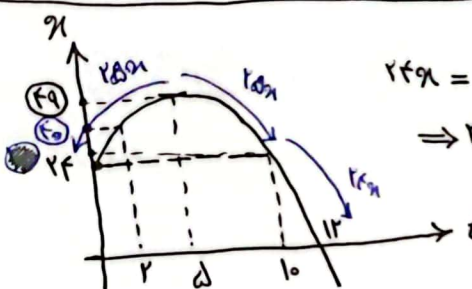
$$v_B > v_A \leftarrow \text{جانب راست}$$

$$\Delta v = \frac{\Delta U}{q} = \frac{20}{2} = 10 \rightarrow v_B = 10$$



$$S_1 = \frac{1}{2} \times 10 \times 10 = 50$$

$$\Rightarrow S_2 = \frac{(10 \times 10)(10)}{2} = 500 \text{ m}$$



$$24x = 24 \rightarrow x = 1$$

$$\Rightarrow 24x = 24$$

$$\Rightarrow 9x = 9 \Rightarrow \bar{S} = \frac{9+24}{2} = \frac{33}{2} = \frac{16.5}{2}$$

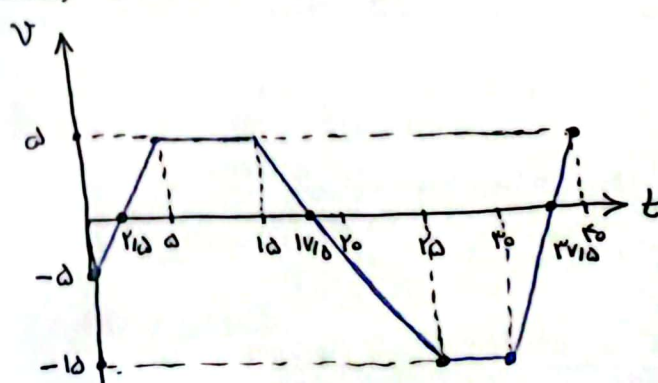
$$\Delta v = 10 = v_2 - (-5) \rightarrow v_2 = 5 \text{ m/s}$$

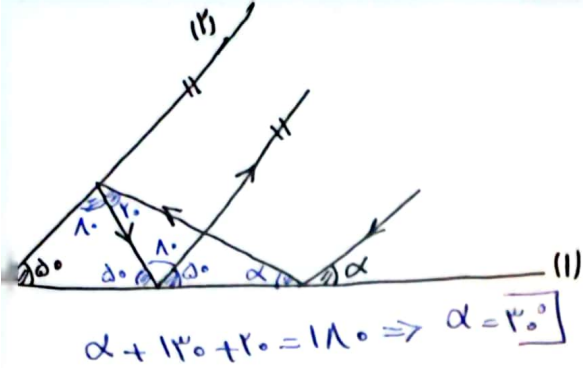
$$\Delta v = 5 = v_3 - 5 \rightarrow v_3 = 10 \text{ m/s}$$

$$\Delta v = -20 = v_4 - 5 \rightarrow v_4 = -15 \text{ m/s}$$

$$\Delta v = 0 \rightarrow v_5 = -15 \text{ m/s}$$

$$\Delta v = 20 \rightarrow v_6 = 5 \text{ m/s}$$





$$\alpha + 140^\circ + 20^\circ = 180^\circ \Rightarrow \alpha = 20^\circ$$

سوال (39)

$$F_{net} = ma$$

$$F_i - F_k = ma$$

$$v^2 - v_0^2 = 2a\Delta x \Rightarrow (12)^2 = 2a(12) \rightarrow a = 4 \text{ m/s}^2$$

$$\rightarrow 4a - F_k = 4(a) \rightarrow F_k = 32 \text{ N}$$

$$\rightarrow F_N = F_r + mg = 20 + 20 = 40 \text{ N}$$

$$\rightarrow R = \sqrt{32^2 + 40^2} = 50 \text{ N}$$

سوال (40)

$$\frac{1}{\lambda} = \frac{ER}{hc} \left(\frac{1}{n_i^2} - \frac{1}{n_f^2} \right)$$

سوال (41)

$$t = 24 \text{ s}$$

$$N = 20 = \frac{t}{T} \Rightarrow T = 1.2 \text{ s}$$

$$\Delta L = -14 \text{ cm}$$

$$T = 2\pi \sqrt{\frac{L}{g}} \Rightarrow L = 44 \text{ cm}$$

$$\Rightarrow \frac{N_f}{N_i} = \frac{t_f}{t_i} \times \sqrt{\frac{L_i}{L_f}} \Rightarrow \frac{N_f}{20} = \frac{t_f}{24} \times \sqrt{\frac{44}{44}}$$

$$\rightarrow N_f = 20$$

سوال (42)

$$N = 20 = \frac{t}{T} \Rightarrow T = 1.2 \text{ s}$$

$$T = 2\pi \sqrt{\frac{L}{g}} \Rightarrow L = 44 \text{ cm}$$

$$\Rightarrow \frac{N_f}{N_i} = \frac{t_f}{t_i} \times \sqrt{\frac{L_i}{L_f}} \Rightarrow \frac{N_f}{20} = \frac{t_f}{24} \times \sqrt{\frac{44}{44}}$$

$$\rightarrow N_f = 20$$

سوال (43)

$$\lambda_f = \text{فاصله بین دو موج هم‌فاز}$$

$$v = \sqrt{\frac{F}{\mu}} = \frac{v}{\lambda} \sqrt{\frac{F}{\mu}}, \quad f = \frac{v}{\lambda}$$

$$\rightarrow v = \frac{v}{\lambda} \sqrt{\frac{F}{\mu}} = 100 \text{ m/s}$$

$$\rightarrow \lambda = \frac{100}{200} = 0.5 \text{ m} = 50 \text{ cm} \rightarrow \lambda_f = 25 \text{ cm}$$

سوال (44)

$$C = \epsilon_0 \mu F$$

$$q_r = \epsilon_r q_i \rightarrow U_r - U_i = 2a$$

$$\rightarrow \frac{1}{\epsilon_r} (q_r - q_i) = 2a$$

$$\rightarrow \frac{1}{\epsilon_r \epsilon_0} \left(\frac{dq_r}{f} \right) = 2a \rightarrow q_i = 4$$

سوال (45)

$$F_{1r} = \frac{q_0 \times \Delta x \times r}{100} = 9 \text{ N} (-i)$$

$$F_{1r} = \frac{q_0 \times \Delta x \times r}{100} = 9 \text{ N} (+j)$$

$$\rightarrow F_{1r} = \frac{q_0 \times q_0 \times r}{(1 - \sqrt{f})^2} = \frac{9}{\sqrt{f}} \rightarrow q_f = -10\sqrt{f}$$

$$F_{1r} \cos 60^\circ = |F_{1r}| = 9 \rightarrow F_{1r} = \frac{18}{\sqrt{f}}$$

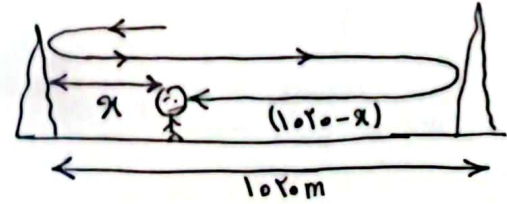
سوال (46)

$$x = 20 \text{ cm} \rightarrow \text{موقع مکانی جسم در لحظه برخورد با دیوار}$$

$$\Delta t = \frac{x}{v}$$

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{1} \Rightarrow T = 1 \rightarrow \Delta t = \frac{1}{2}$$

سوال (47)



$$x = vt \Rightarrow \frac{x}{100 - x} = \frac{v}{f} \Rightarrow x = 34 \text{ cm}$$

در حالت اول: $I = \frac{12}{4} = 3A$

ولتاژ بار $V_1 = RI = 10V$

در حالت دوم: $A_1 = 3A$

در حالت اول: $I = 0 \rightarrow Ar = 0$
 $Vr = E = 12$

$|\vec{E}| = \frac{N\Delta\phi}{\Delta t} = \frac{NAB\Delta B}{\Delta t} = \frac{100 \times 50 \times 200}{0.1} = 10^6$

با کاهش I شار کم می شود ← جهت جریان الکتریکی در سیم (1) و (2) به ترتیب
 یا در سیم دوم معکوس می شود

$\rho P = \rho gh + P_0 \quad \therefore P = \frac{mg}{A} + P_0$

$P_0 = \rho_{\text{air}} g h_{\text{atm}} \rightarrow 1.2 \times 10 \times 10 = 12000 Pa$

$P = \frac{2 \times 10 \times 10 \times 10}{20 \times 10^{-4}} = 10000 Pa$
 $\rightarrow P = 10400 Pa$

$\therefore P = \frac{2 \times 10 \times 10 \times 10}{20 \times 10^{-4}} = 10000 Pa$

$W_T = \Delta K \rightarrow W_{mg} + W_{fk} = \frac{1}{2} m (v_f^2 - v_i^2)$

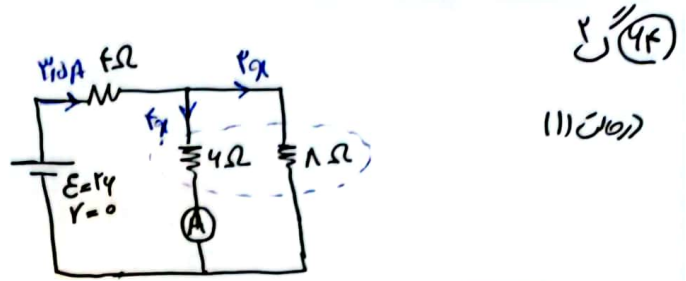
$\rightarrow (0.12 \times 10 \times 15) + W_{fk} = \frac{1}{2} (0.12) (18^2 - 10^2)$

$\rightarrow W_{fk} = -14 J$

فاز 40°C ← 100°C, 50°C ← $\theta_e = 20^\circ C$

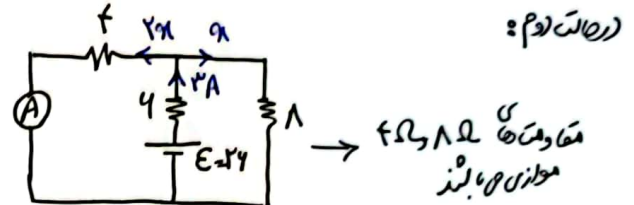
$Q_1 + Q_2 = Q_3$

$52g, 15^\circ C \quad C \times (40 - 20) + 0.1 \times 400 \times (50 - 20)$
 $= 0.12 \times 400 \times (20 - 15)$
 $\rightarrow C = 243 J/^\circ C$



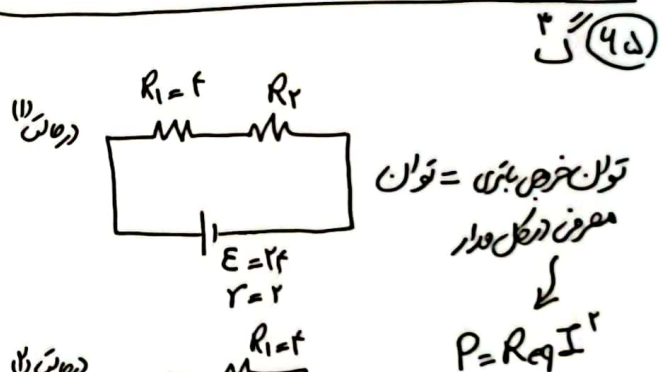
$I = \frac{E}{R_{eq}} = \frac{24}{\frac{4 \times 1}{4+1}} = \frac{24}{0.8} = 30A$

$\rightarrow Vx = V_r \rightarrow x = 15 \rightarrow 3x = 45A$



$\rightarrow I = \frac{24}{\frac{4}{3} + 4} = 3A$

$3x = 3 \rightarrow x = 1A \Rightarrow 15 - 1 = 14A$



1) در حالت اول: $I_1 = \frac{24}{R_2 + 4}$, $R_{eq} = R_2 + 4$

2) در حالت دوم: $I_2 = \frac{24}{\frac{4R_2}{R_2 + 4} + 2}$, $R_{eq} = \frac{4R_2}{4 + R_2} + 2$

$\frac{P_1}{P_2} = 0.14 \Rightarrow \frac{(R_2 + 4)^2}{\frac{4R_2}{4 + R_2} + 2} \times \left(\frac{\frac{4}{R_2 + 4}}{\frac{4R_2}{R_2 + 4} + 2} \right)^2 = \frac{4}{100}$

$\rightarrow \frac{(R_2 + 4)^2}{4R_2} \times \left(\frac{(R_2 + 4)}{(R_2 + 4)} \right)^2 = \frac{4}{100}$
 $R_2 = 4 \leftarrow$

۲ (۷۲)

$$K = \frac{1}{2} m v^2$$

$$m = 200$$

$$v = 215 \frac{\text{km}}{\text{s}} \times \frac{1000 \text{ m}}{1 \text{ km}} = 215000 \frac{\text{m}}{\text{s}}$$

$$\rightarrow K = \frac{1}{2} (200) (215000)^2 = 420 \times 10^9 \text{ J} = 420 \text{ MJ}$$

۳ (۷۳)

$$\dot{F} = d \dot{C} \Rightarrow \dot{F} = 1/18 \dot{C} + 32$$

$$\rightarrow (d - 1/18) \dot{C} = 32 \rightarrow \dot{C} = 10$$

$$\rightarrow T(k) = \theta(\dot{C}) + 2V3 = 283$$

۴ (۷۴)

$$q = 140 \times 10^{-10} \text{ C} = 140 \times 10^{-10} \times 10^{-9} = 14 \times 10^{-19} \text{ C}$$

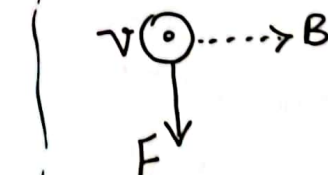
$$= 1.4 \times 10^{-18} \text{ C}$$

۵ (۷۵)

$$F = qvB \Rightarrow 4 \times 10^{-18} = 1.4 \times 10^{-18} \times 5 \times 10^5 \times B$$

$$\rightarrow B = 0.57 \text{ T}$$

طبق قانون دست راست :



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