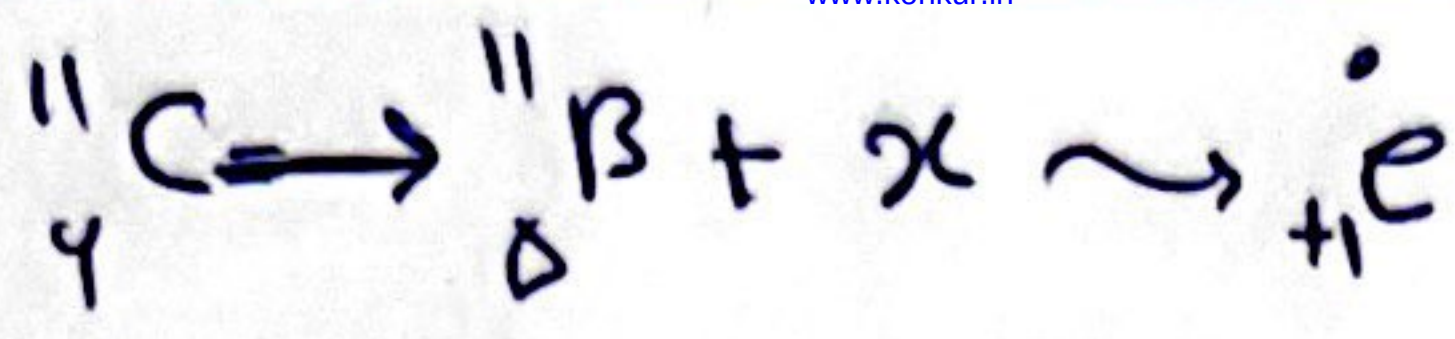
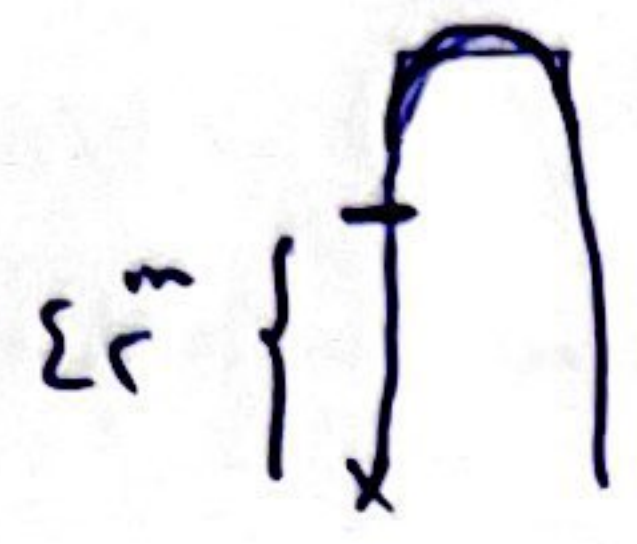




۲ (۴۱)

۳ (۴۲)

$$h = \frac{v_r}{rg} = \frac{r \lambda_m}{r} = (۴۳)$$



$$K_2 = \frac{v_2}{v_1} K_1$$

$$\frac{1}{2} m v_2^2 = \frac{v_2}{v_1} \frac{1}{2} m v_1^2$$

$$v_1^2 = rgh + v_r^2$$

$$v_1^2 = r^2 \omega^2 + v_r^2$$

$$\gamma^2 v_1^2 = \sum r \cdot x^2$$

$$v_1 = \sqrt{r \omega}$$

۱۲ (۴۳)

$$L_2 = L_1 (1 + \alpha \Delta \theta)$$

$$q_{p0}, q = q_{\infty} (1 + 1.2 \alpha x_1^{-0.5} \Delta \theta) \rightarrow \Delta \theta = 1.0 \text{ } ^\circ\text{C}$$

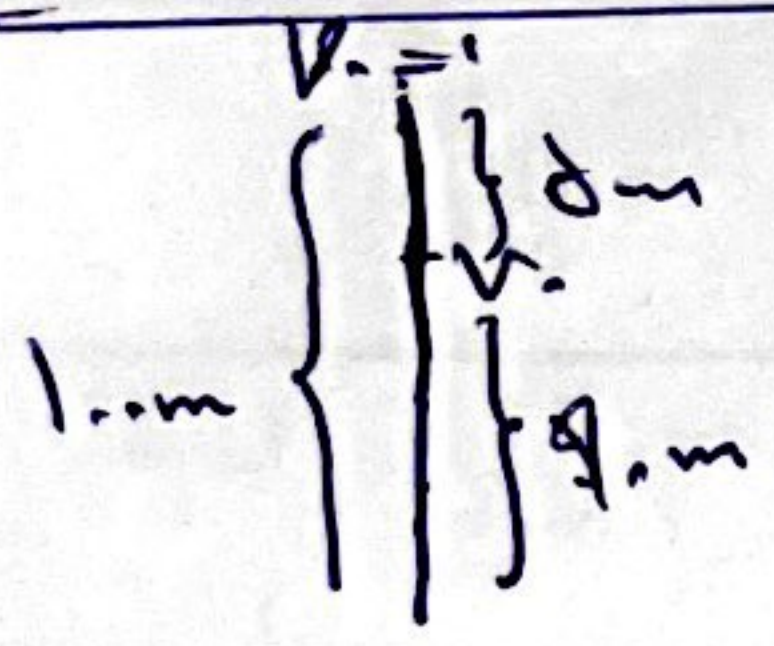
۱ (۴۴)

۲ (۴۵)

$$x_A = x_B \Rightarrow \frac{1}{2} a t^2 + v_i t = \frac{1}{2} (a + \dots) (t - \dots)^2 + \dots$$

$$a \times 37 = (a + \dots) (4)^2 \rightarrow a = 0, \sum m/s$$

$$|x_A - x_B| = \frac{1}{2} \times 9.8 \times 1.0^2 - \frac{1}{2} \times 9 \times 1^2 = 1.1 \text{ m}$$



۴ (۴۶)

۲ (۴۷)

$$\Delta x = v t = 2.0 \times 1 = 2.0 \text{ m} \rightarrow x_B$$

$$x_A = x_B$$

$$\frac{1}{2} (-2) t^2 + 1t + 24 = \frac{1}{2} (-2) (t-1)^2 + 2.0(t-1) + 2.0t$$

$$-t^2 + 1t + 24 = -2(t^2 - 2t + 1) + 2.0(t-1) + 2.0t \rightarrow t = 4s$$

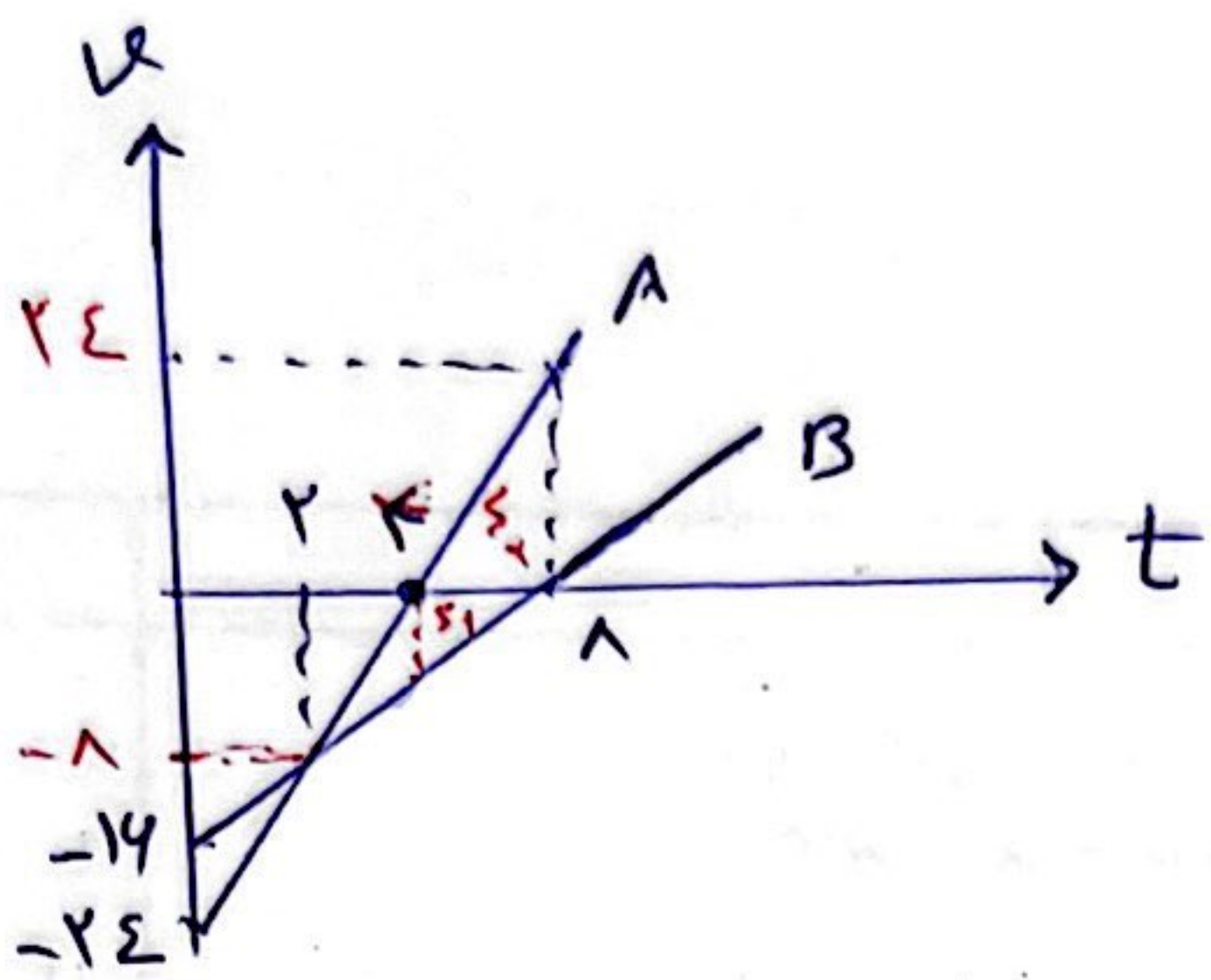
برابر A

$$t-1 = 3s \leftarrow \text{برابر B}$$

$$v = at + v_i = -2 \times 3 + 2 = -4 \text{ m/s}$$

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$$S_1 = \frac{\Sigma \times (-1)}{1} = -17$$

$$S_2 = \frac{\Sigma \times 2\varepsilon}{1} = \Sigma \Lambda$$

$$17 + \Sigma \Lambda = 48$$

3 (F1)

$$\vec{p} = (3t - 4)\vec{i}$$

$$F = \frac{\Delta p}{\Delta t} = \frac{3 - (-3)}{1} = \frac{6}{1} = 3\vec{i}$$

2 (F9)

1 (d0)

$$\square \rightarrow 24N$$

$$F - f_k = ma$$

$$24 - 2 \times 8 = 8a$$

$$a = 1, 2$$

$$R = \sqrt{f_k^2 + f_n^2}$$

$$R = \sqrt{2^2 + 16^2} = 16, 2$$

3 (a1)

$$F = m \frac{v^2}{R} = 2m \times \frac{48}{16} = 12m$$

2 (d2)

$$f_n = \frac{n v}{2L} \rightarrow 3 = \frac{3 v}{2 \times 0,4}$$

$$v = 1, 2$$

$$f_1 = \frac{1 v}{2L} = 1, 2$$

3 (d2)

$$\Delta \beta = 1 \cdot \log \left( \frac{P_2}{P_1} \times \left( \frac{r_1}{r_2} \right)^2 \right) = 1 \cdot \log \left( 2 \times \left( \frac{1}{\frac{1}{2}} \right)^2 \right) = 1 \cdot \log 8 = 9 \text{ dB}$$

4 (d5)

3 (d8)

$$\frac{112,8}{1,2} = \sqrt{\frac{L_2}{L_1}} \Rightarrow$$

$$\frac{9}{1} = \sqrt{\frac{L_1 + 14}{L_1}} \rightarrow$$

$$\frac{81}{1} = \frac{L_1 + 14}{L_1}$$

$$L_1 = 48 \text{ cm}$$

$$T = 2\pi \sqrt{\frac{L}{g}} = 2\pi \sqrt{\frac{0,48}{9,8}} = 2 \times 0,44 = 0,88 \text{ s}$$

مطلوبه جواب

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1 (24)

$$\Delta \phi = \frac{2\pi}{T} \quad T = \frac{1}{f} = 0.5 \quad t = 0.5 \quad -A \quad 0 \quad +A$$

$$S_{av} = \frac{2A}{0.5} = 1.8 \rightarrow A = 1.8 \text{ cm}$$

4 (25)

$$f = \frac{nv}{\lambda} \rightarrow f = \frac{20}{2 \times 0.18} = 20 \text{ Hz} \quad T = \frac{1}{f} = 5 \times 10^{-2} \text{ s}$$

1 (26)

$$E_u - E_l = 12.75 \rightarrow +13.6 \left( \frac{1}{n'^2} + \frac{1}{n^2} \right) = 12.75$$

$$-\frac{1}{n'^2} + \frac{1}{n^2} = \frac{12.75}{13.6} = \frac{200}{272} = 0.9 \quad \left\{ \begin{array}{l} n' = 2 \\ n = 1 \end{array} \right.$$

2 (29)

$$\frac{k_2}{k_1} = \frac{hf - W_0}{hf - W_0} \Rightarrow \frac{4}{1} = \frac{2hf - 2}{hf - 2} \rightarrow hf = 2 \text{ eV} \rightarrow \lambda = 250 \text{ nm}$$

4 (30)

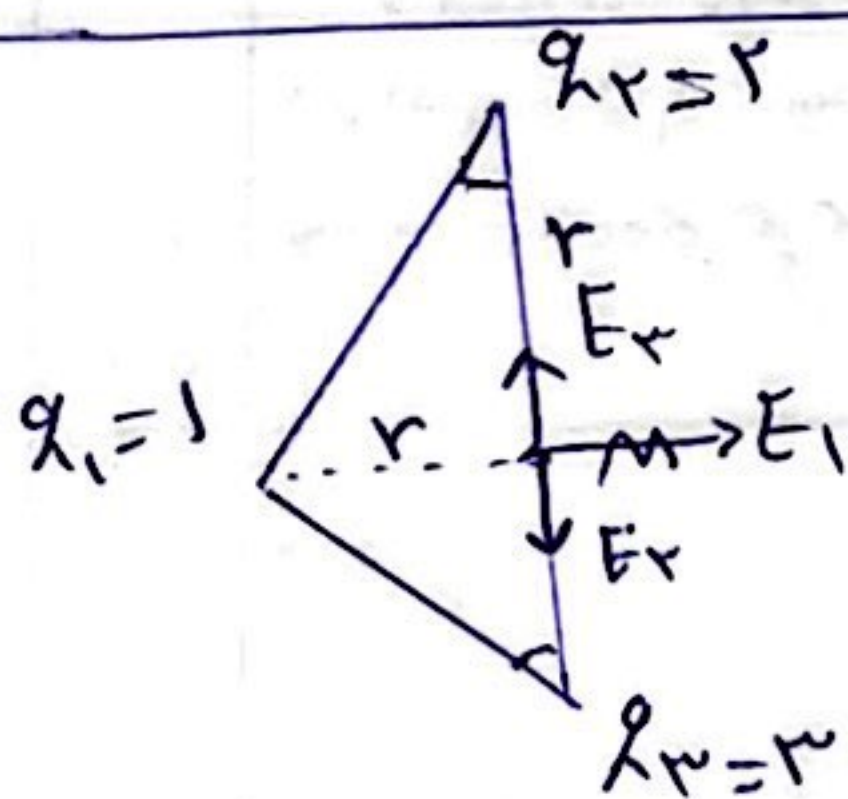
$$\frac{U_2}{U_1} = \left( \frac{V_2}{V_1} \right)^2 \rightarrow \frac{U_2}{U_1} = \frac{9}{16}$$

3 (41)

4 (42)

$$V_B - V_A = \frac{\Delta U}{q} = \frac{2 \times 10^{-7}}{-2 \times 10^{-9}} = -10 \text{ V} \quad + \quad \ominus \rightarrow -$$

1 (43)



$$E_1 = \frac{k|q_1|}{r^2} = \frac{q_1}{r^2}$$

$$E_2 = \frac{k|q_2|}{r^2} = \frac{2q_1}{r^2}$$

$$E_3 = \frac{k|q_3|}{r^2} = \frac{2q_1}{r^2}$$

$$E_T = \frac{q\sqrt{3}q_1}{r^2} \star$$

$$E_R = \frac{q\sqrt{3}q_1}{r^2}$$

$$E_1 = \frac{q_1}{r^2}$$

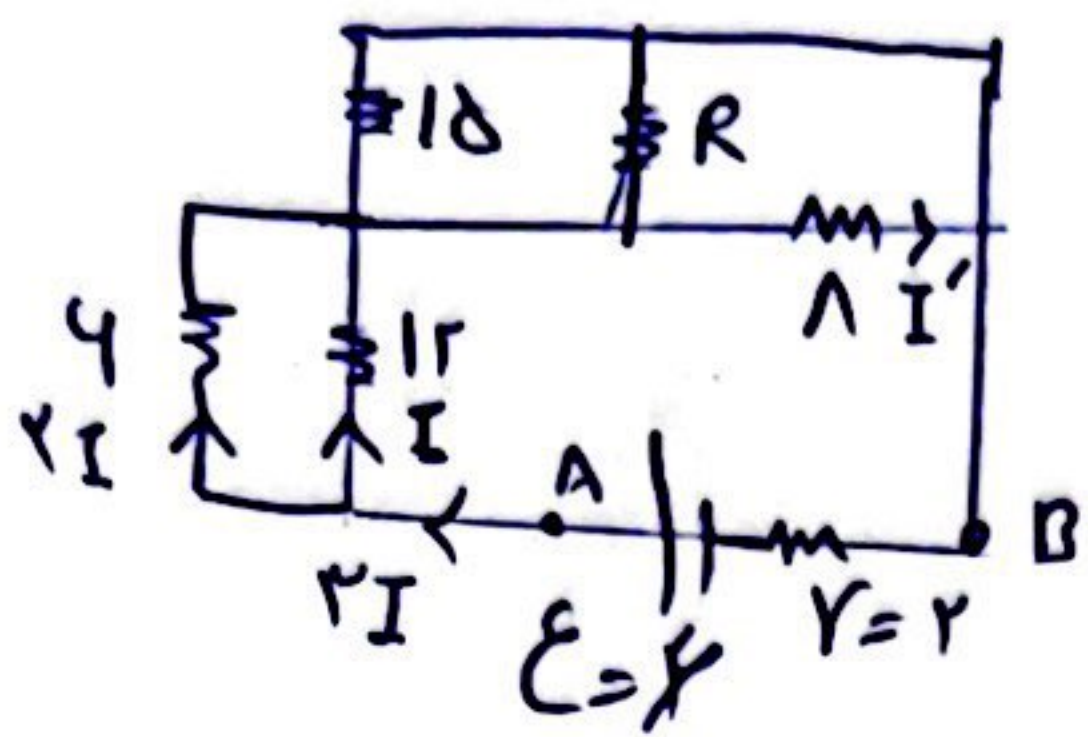
$$E'_T = \frac{q_1}{r^2} (\sqrt{1+9}) = \frac{q\sqrt{10}}{r^2} q_1$$

$$\frac{E'}{E} = \frac{\sqrt{10}}{\sqrt{3}} = \sqrt{10/3}$$

: q2 حذف

درمورد جواب  
0.9121 = 0.954





$$V_A - 12I - 12I' = 2(12I) + 4 = V_A$$

$$12I' = 4(12I)$$

$$I' = \frac{1}{3}I$$

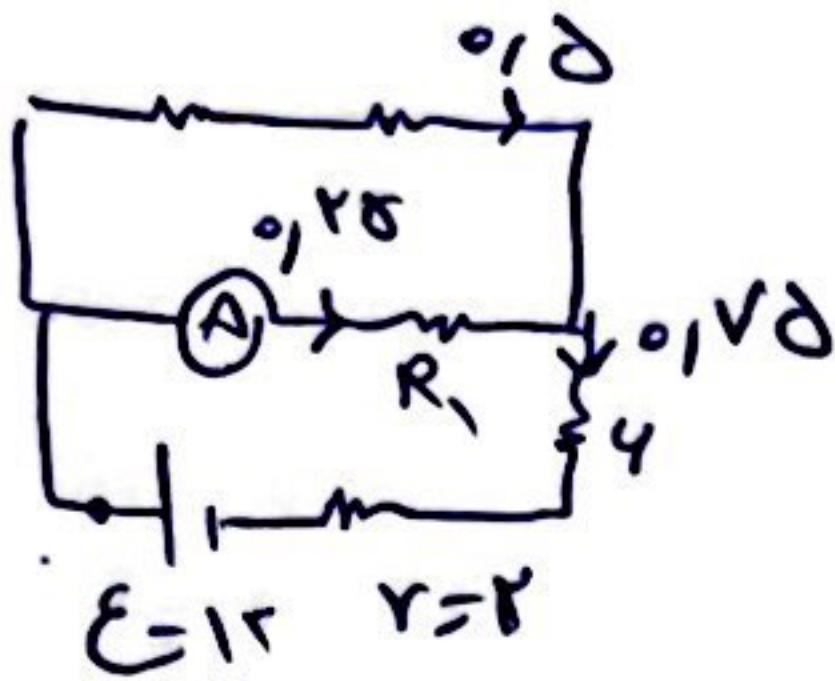
$$-12I - 12\left(\frac{1}{3}I\right) - 4I + 7 = 0$$

$$I = \frac{1}{8}A$$

$$I' = 0.125A$$

2 (4f)

$$V = RI \rightarrow I_{(1.2)} = \frac{0.8}{1} = 0.8$$



$$V(4) = RI = 4 \times \frac{1}{2} = 2.0$$

$$V_{\text{ext}} = \varepsilon - rI = 1.0$$

$$V(R_1) = 1.0 - 2.0 = -1.0 \rightarrow -1.0 = R_1 \times 0.25$$

$$R_1 = 4\Omega$$

4 (4d)

$$\text{1) } V = R_T I_T = 3R \times \frac{\varepsilon}{3R + R_T} = \frac{4\varepsilon}{VR}$$

$$\text{2) } V' = R_T I_T = 2R \times \frac{\varepsilon}{\frac{R}{T} + 2R} = \frac{2\varepsilon}{\Delta R}$$

$$\frac{V'}{V} = \frac{\frac{2\varepsilon}{\Delta R}}{\frac{4\varepsilon}{VR}} = \frac{1\varepsilon}{18}$$

3 (44)

$$B_1 = \frac{\mu \cdot NI}{2r} = \frac{12 \times 10^{-6} \times 1 \times 0.8}{2 \times 10 \times 10^{-2}} = 4 \times 10^{-4}$$

$$B_{1,2} = 2\sqrt{2} \times 10^{-4}$$

$$B_T = 10^{-4} \left( \sqrt{(2\sqrt{2})^2 + 2^2} \right) = 2\sqrt{3} \times 10^{-4}$$

4 (4v)

$$L = k \frac{\mu \cdot N^2 A}{l} = \frac{4\pi \times 10^{-7} \times 10^4 \times 10 \times 10^{-2}}{10 \times 10^{-2}} = 7.8 \times 10^{-3}$$

5 (41)

6 (49)

$$\varepsilon = -\frac{N \Delta \Phi}{\Delta t} = -\frac{3.14 \times 10^4 \times 10^{-2} \times 10 \times 10^{-2} \times \frac{1}{2}}{10 \times 10^{-2}} = 1.57V$$

7 (v)

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F

VI

$$P = \frac{F}{A} \rightarrow m \times l = l_0 \times \Delta x \quad m = \Delta \cdot g \cdot r$$

F

VII

$$W = K_f - K_i \Rightarrow F_T d \cos \theta = \Delta K$$

$$\Delta K = \frac{1}{2} m v_f^2 - \frac{1}{2} m v_i^2 = F_T \cdot d$$

I

VIII

$$\theta_c = \frac{m_1 c_1 \theta_1 + m_2 c_2 \theta_2 + \dots}{m_1 c_1 + m_2 c_2 + \dots} = \frac{\lambda_1 \times \Sigma \nu_1 \times \nu_1 + \nu_1 \times \Sigma \nu_2 \times \lambda_2 + \nu_2 \times \Sigma \nu_3 \times \lambda_3}{\lambda_1 \times \Sigma \nu_1 + \nu_1 \times \Sigma \nu_2 + \nu_2 \times \Sigma \nu_3} = 32^\circ$$

F

IX

$$P_1 V_1 = P_2 V_2$$

$$\left( P_1 + \frac{1}{2} \rho v_1^2 \right) \times F_1 A = \left( P_2 + \frac{1}{2} \rho v_2^2 \right) \times F_2 A \rightarrow P_1 = P_2 = P_a$$

F

X

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