

(۲) ~ (۴۱)

$$\begin{aligned} g_1 &> 0 \\ g_2 &< 0 \end{aligned} : |g_1| > |g_2|$$

(۳) ~ (۴۲)

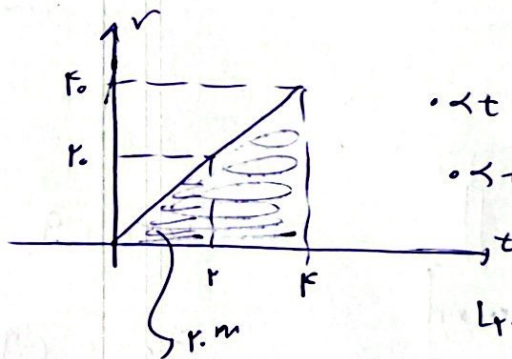
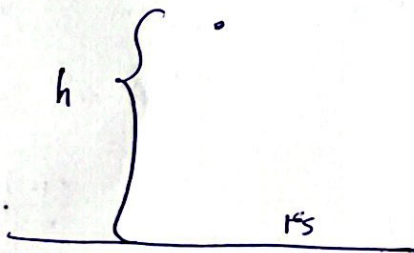
(۱) ~ (۴۳)

$$P \omega \cdot h = P \omega (10^5) (2400) \text{ J}$$

(۲) ~ (۴۴)

$$\rightarrow \frac{P \omega (10^5) (24)}{10^4} = 90 \text{ MJ}$$

(۴) ~ (۴۵)



$$0 < t < r \rightarrow r.m = L$$

$$0 < t < r \rightarrow L.m = L$$

$$L_2 - L_1 = r.m$$

(۱) $a_1 = 10 \text{ m/s}^2$
 $v_0 = 0$
 $v = 10 \frac{\text{m}}{\text{s}}$
 $x_1 = 0$
 $x_2 = 10 \text{ m}$

$a_2 = 2 \text{ m/s}^2$
 $v_0 = 0$
 $x_1 = 0$
 $x_2 = 10 \text{ m}$

(۱) ~ (۴۶)

$$v_1 = v_2 \rightarrow 10t + 10 = 2t \rightarrow t = 1.5$$

$$x_1 = x_2 \rightarrow \frac{1}{2} 10 t^2 + 10t + 10 = \frac{1}{2} 2 t^2$$

$$\rightarrow t = 2.5$$

$$\Delta t = 2.5 - 1 = 1.5$$

استاد: مجتبیٰ نکوئیان

پاسخ تشریحی فیزیک رشته ریاضی

$$v_A = \frac{y}{c} = \frac{r m}{s}$$

(۴) (۴۷)

$$t = 5s \rightarrow x_A = x_B \rightarrow r t + r_0 = \frac{1}{r} a t^2 + v_0 t + x_0$$

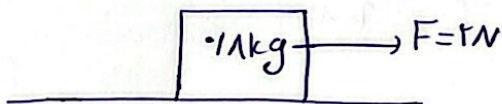
$$\rightarrow r_A = 1a + 4a + 0 \rightarrow a = -\frac{r_0}{r} \frac{m}{s^2}$$

$$v = ct^2 - 1 \rightarrow a = 4t$$

(۱) (۴۸)

$$r < t < 4 \xrightarrow{t=5s} a_{av} = 4(5) = 18 \frac{m}{s^2}$$

$$v_0 = -\frac{m}{s}$$



$$\xrightarrow{r=1} F_{net} = ma \rightarrow a = \frac{r_0}{r} \frac{m}{s^2} \quad (۴۹)$$

$t = 5s$
 لحاظ کرتے ہوئے $\frac{m}{s}$ ہے
 اس وقت سے نوں



$$T = m(g - |a|)$$

(۴) (۵۰)

$$F_{ce} = 50(9.8 - |a|) \rightarrow |a| = 1.2 \frac{m}{s^2}$$

$$F_{net} = ma \rightarrow F = m_1(12) = m_2(4) \rightarrow m_2 = 3m_1 \quad (۵۱)$$

$$\xrightarrow{12m_1} F = (m_2 - m_1) a = 2m_1 a \rightarrow a = 4 \frac{m}{s^2}$$

استاد: مجتبی نکوئیان

پاسخ تشریحی فیزیک رشته ریاضی

$$T = \frac{2\pi R}{v} \text{ s} \longrightarrow \omega = \frac{2\pi}{T} = \frac{2(2\pi R)}{\frac{2\pi R}{v}} = 4 \text{ rad/s} \quad (2) \quad (22)$$

$$\frac{\mu_s mg}{\phi_{\text{max}}} = \mu_s r \omega^2 \longrightarrow \mu_s (10) = \frac{1}{16} (24) \quad (24)$$

$$\longrightarrow \mu_s = 7.24$$

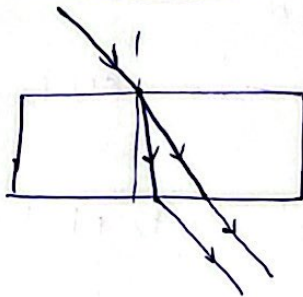
$$m_A = m_B \xrightarrow{P_A = P_B} v_A = v_B \xrightarrow{A_A = r_A \omega} \frac{L_A}{L_B} = \frac{1}{4} \quad (25) \quad (23)$$

$$v = \sqrt{\frac{FL}{m}} \longrightarrow \frac{v_A}{v_B} = \sqrt{\frac{F_A}{F_B} \times \frac{L_A}{L_B} \times \frac{m_B}{m_A}}$$

$$\longrightarrow \frac{100}{v_B} = \sqrt{\frac{1}{4}} = \frac{1}{2} \longrightarrow v_B = 200 \frac{\text{m}}{\text{s}}$$

$$mg = k \Delta x \longrightarrow r = k \left(\frac{r_1 \omega}{100} \right) \longrightarrow k = 1.0 \frac{\text{N}}{\text{m}} \quad (26) \quad (24)$$

$$A = 2 \text{ cm} \longrightarrow k_m = E = \frac{1}{r} k A^2 = \frac{1}{r} (10) (2 \times 10^{-2})^2 = 14 \text{ mJ} \quad (27) \quad (25)$$



$$\hbar \omega_m = \hbar \omega_f - \hbar \omega_0$$

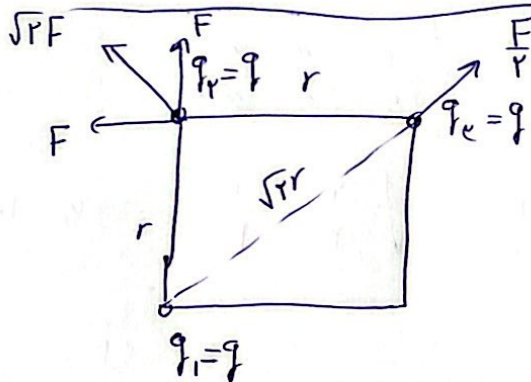
① - (51)

② - (59)

$$N = \frac{N_c}{r^n} = \frac{N_c}{14} \rightarrow n = r = \frac{t}{T_{hr}}$$

④ - (40)

$$\rightarrow T_{hr} = 2 \text{ hr}$$



$$q_1 q_2 \rightarrow F$$

$$\frac{\sqrt{2} F}{\frac{F}{r}} = 2\sqrt{2}$$

⑤ - (41)

$$\epsilon \cdot \vec{r} = \frac{k \epsilon \cdot A}{d}$$

$$E = \frac{r}{d}$$

$$u = \frac{1}{t} \epsilon \cdot \vec{r}$$

⑥ - (42)

① -

$$I = \frac{11-4}{9} = 2A$$

⑦ - (43)

$$P_1 = \epsilon I - r_1 I^2 = 2 - (1)(2) = 2 \text{ W}$$

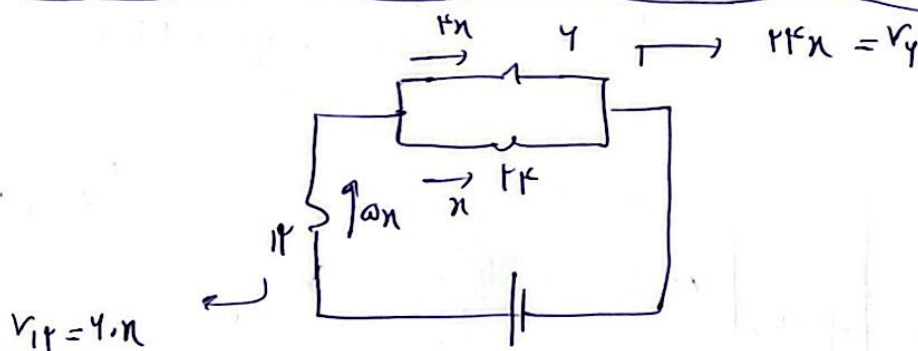
$$P_{r_{\text{دور}}} = \epsilon I + r_1 I^2 = 2(2) + 1(2) = 2 \text{ W}$$

$$\frac{P_r}{P_1} = \frac{\omega}{\lambda}$$

$$R = \frac{\rho L}{A} = \frac{\rho \pi r^2 d}{m} \rightarrow \text{کلاس}$$

(24)

$$\rightarrow \frac{R_A}{R_B} = 1 \times 1 \times 1 \times 1 = 1$$



(25)

$$\frac{V_{12}}{r_y} = \frac{4.0V}{r_y} = \frac{\omega}{r}$$

(26)

$$B = \frac{\mu_0 N I}{\ell} \rightarrow |\omega V_{x1}| = \frac{r(\ell \pi r^2 \omega)}{10^{-1}} \quad (27)$$

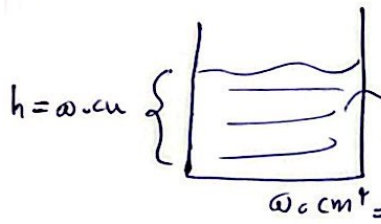
(28)

$$\rightarrow N = \omega \dots$$

$$\phi_{\text{اف}} = B A \cos \theta = (\omega x 10^{-7}) (\pi x 10^{-6}) (1) = \pi x 10^{-13} \omega b \quad (29)$$

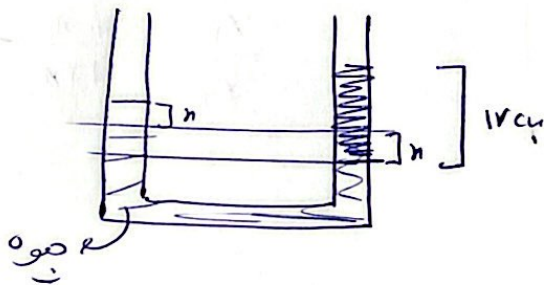
$$\phi_{\text{ف}} = 0 \quad \rightarrow \Delta \phi = -\pi x 10^{-13} \omega b \quad (30)$$

(۲) (۲۹)



$h = 50 \text{ cm}$
 $50 \text{ cm}^2 = A$
 $2500 \text{ cm}^3 = V$
 $V = Ah \rightarrow h = 50 \text{ cm}$

$(\rho h)_{\text{جوہ}} = (\rho h)_{\text{جوہ}} \rightarrow 1.2(50) = 1.2 h_2$
 $\rightarrow h_2 \approx 15.2 \text{ cm}$



$(\rho h)_{\text{جوہ}} = (\rho h)_{\text{جوہ}}$

$(1.2)(2n) = 2(1.2)$

$\rightarrow n = 1.2 \text{ cm}$

$W_t = \Delta k = \frac{1}{2} m (v_B^2 - v_A^2) \quad ; \quad v_A = 40 \frac{\text{m}}{\text{s}}$

$\rightarrow 24000 = \frac{1}{2} (40) (v_B^2 - 1600)$

$\rightarrow v_B^2 = 2400 \rightarrow v_B = 40 \frac{\text{m}}{\text{s}} = 144 \frac{\text{km}}{\text{h}}$

(۷۱)

(۴)

استاد: مجتبیٰ نکوئیان

پاسخ تشریحی فیزیک رشته ریاضی

پ: (۱)

$$\frac{k_1}{k_2} = \frac{m_1}{m_2} \times \left(\frac{v_1}{v_2}\right)^2$$

(۷۲) ✓

ع: (۲)

$$\frac{1}{r} = 2 \times \left(\frac{v_1}{v_2}\right)^2 \longrightarrow \frac{v_1}{v_2} = \frac{1}{\sqrt{2}}$$

$$v'_1 = v_1 + 2 \longrightarrow k'_1 = k_2$$

$$\longrightarrow 1 = 2 \times \left(\frac{v_1 + 2}{2v_1}\right)^2 \xrightarrow{\text{جذر}} \frac{1}{\sqrt{2}} = \frac{v_1 + 2}{2v_1}$$

$$\longrightarrow 2v_1 = \sqrt{2}v_1 + 2\sqrt{2} \longrightarrow (2 - \sqrt{2})v_1 = 2\sqrt{2}$$

$$\longrightarrow v_1 = \frac{2\sqrt{2}}{2 - \sqrt{2}} \frac{m}{s}$$

(۷۳) ✓ (۲)

$$\frac{P_1 v_1}{n_1 T_1} = \frac{P_2 v_2}{n_2 T_2} \quad \frac{P_1 = P_2}{v_1 = v_2} \longrightarrow \frac{1}{n_1 T_1} = \frac{1}{n_2 T_2}$$

(۷۴) ✓ (۱)

$$\longrightarrow \frac{1}{290 n_1} = \frac{1}{298 n_2} \longrightarrow n_2 = \frac{290}{298} n_1$$

$$\Delta n = \frac{1}{298} n_1$$

(۷۵) ✓ (۴)
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(۷۶) ✓ (۵)