

۴۱ - ۴۲

$$P = \frac{mgh}{\Delta t} \rightarrow \dots = \frac{40(10)h}{10} \rightarrow h = 0.1 \text{ m}$$

۴۲ - ۴۳

$$N = \frac{c_0}{\frac{r\omega}{100}} = 10$$

$$\frac{m \text{ rad}}{\text{min}} \times \frac{1}{60} = n \frac{\text{rad}}{\text{s}} \rightarrow n = \frac{c\pi}{r}$$

$\hookrightarrow 4.5$

۴۳ - ۴۴

۴۴ - ۴۵

$$\frac{r_f}{r_i} = \frac{\omega}{F}$$

$$\frac{kr}{k_i} = \frac{\omega}{F}$$

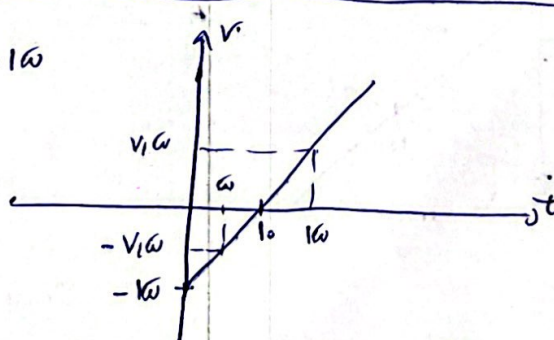
$$\frac{\omega}{F} = \frac{m_r}{m_i} \times \frac{r\omega}{14}$$

$$\rightarrow \frac{m_r}{m_i} = \frac{F}{\omega} \rightarrow m_r = 1 \text{ kg}$$

$$\Delta m = -1 \text{ kg}$$

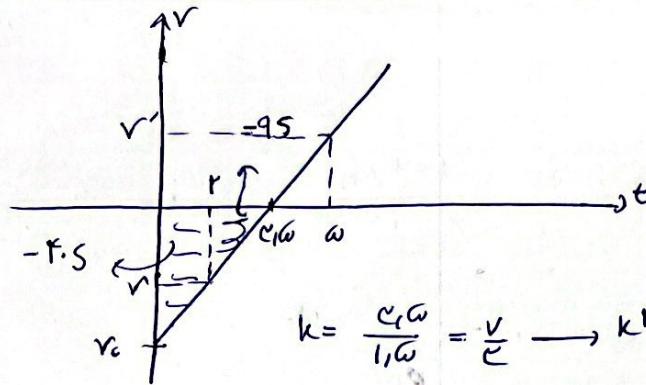
۴۴ - ۴۵

$$r = \frac{c}{r}t - 1\omega$$



$$\cdot \text{ } t < 1\omega \rightarrow v_{av1} = \frac{-r_f\omega}{r} \frac{n}{s}$$

$$1\omega < t < 2\omega \rightarrow v_{av2} = \frac{v_1\omega}{r} \frac{n}{s} \rightarrow \frac{v_{av1}}{v_{av2}} = -c$$

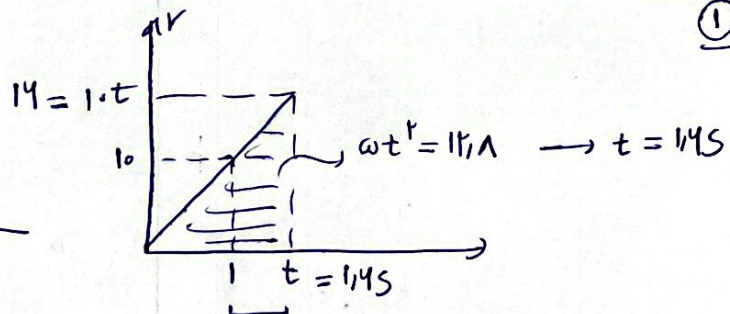


$$k = \frac{c_1 \omega}{1, \omega} = \frac{v}{c} \rightarrow k^2 = \frac{49}{9}$$

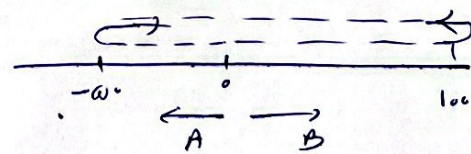
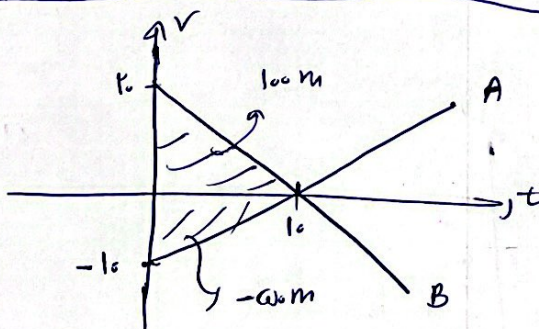
$$-4.5 = -r_0 \rightarrow S = \frac{1}{P} \rightarrow -4.5 = -\frac{9}{P} \rightarrow v = -4 \frac{m}{s}$$

$$t = \omega S \rightarrow v' = 4 \frac{m}{s}$$

$v_0 = 0$
11.8 m



$$S = \frac{24}{P} (1.4) = 11.8 m$$

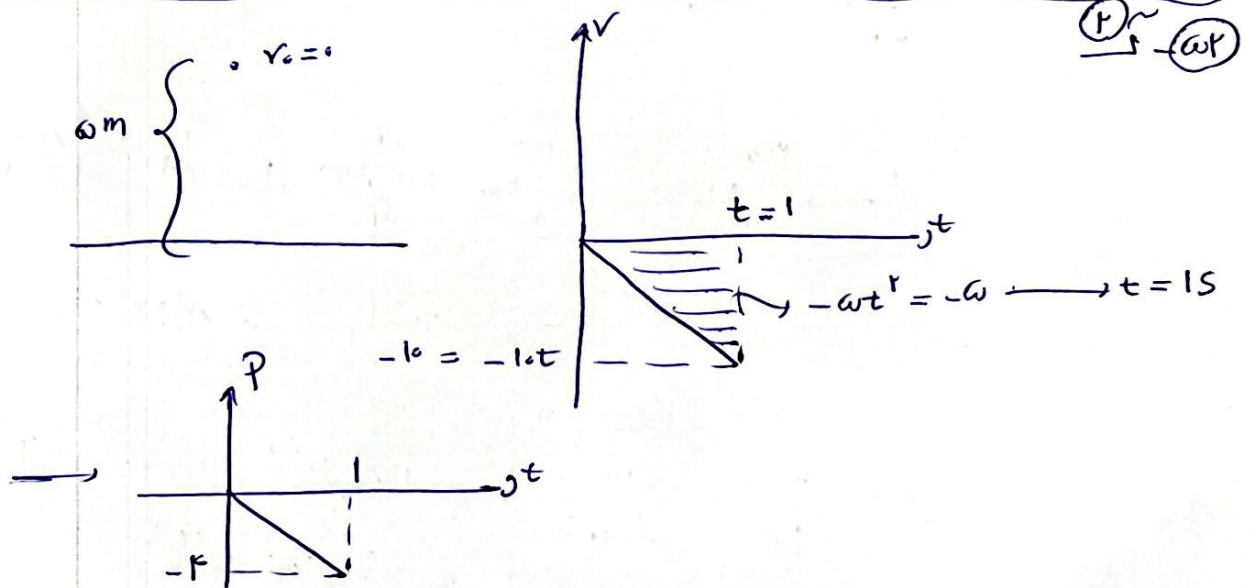


۲) بار فاصله ۱۰۰ متر ۱۰۰ م از نو

$$\Delta p = 2(\omega) + 2(1) + 1(4) = 42 \text{ kg} \cdot \frac{\text{m}}{\text{s}}$$

$$\frac{42}{\Delta p} = \frac{f}{m \Delta v} \rightarrow \Delta v = 1 \frac{\text{m}}{\text{s}} \rightarrow a_{av} = \frac{\Delta v}{\Delta t} = 1.4 \text{ m/s}^2$$

(۴) (۵۰) (طبق قانون اول نیوتن)



$$T = \frac{2\pi}{\omega} = \frac{1}{10} \text{ s} \quad \therefore \frac{t}{T} = \frac{\omega}{f} \quad (\text{میانگونی})$$

$$\rightarrow k_{\max} = E = \frac{1}{2} m \omega^2 A^2 = 40\pi^2 \text{ mJ}$$

(۱) (۵۳)

$$\lambda = 2.00 \text{ cm} = 2 \text{ m}$$

$$\lambda = \frac{c}{f} \rightarrow f = \frac{c \times 10^8}{\lambda} = 150 \text{ MHz}$$

(۲) (۵۵)

استاد: مجتبیٰ نکوئیان

پاسخ تشریحی فیزیک رشته ریاضی

منه $n > n_{\text{آب}}$ و با برآز خط عمود رود شوند

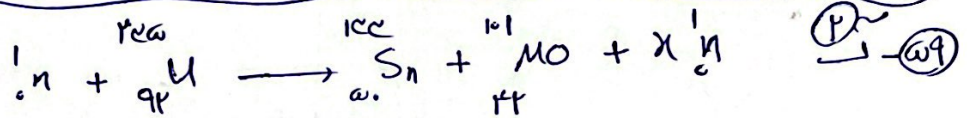
④ ~ ⑤۶

④ ~ ⑤۷

① ~ ⑤۸

$$\frac{1}{\lambda_{\max}} = R \left(\frac{1}{14} - \frac{1}{25} \right) \quad \rightarrow \quad \frac{\lambda_{\max}}{\lambda_{\min}} = \frac{25}{9}$$

$$\frac{1}{\lambda_{\min}} = R \left(\frac{1}{14} - 0 \right)$$



$$\rightarrow x=2 \quad ; \quad M_2 < M_1$$

$$\rho = \frac{m}{V} = \frac{m}{\frac{4}{3}\pi r^3} = \frac{11.7 \times 10^{-27}}{\frac{4}{3}\pi (1.14 \times 10^{-14})^3}$$

$$= 1.17 \times 10^{14} \frac{\text{kg}}{\text{m}^3} = 1.17 \times 10^{14} \text{ g/cm}^3$$

④ ~ ۶۱

② ~ ۶۲

لاستیک $\rightarrow$ $\leftarrow$ ۴ بلبل

$$Q = C \Delta T$$

۴ بلبل $\leftarrow$

$$\frac{C_r}{C_l} = \frac{d_l}{d_r} = 4$$

$$\frac{|I_r|}{1} = \frac{\omega_c}{2\omega} = 2 \rightarrow I_r = -2 \text{ A} \quad (43) \quad (44)$$

$$P = V_{\text{مولد}} \times I = 4 \times 1.5 = 6 \text{ W} \quad (45) \quad (46)$$

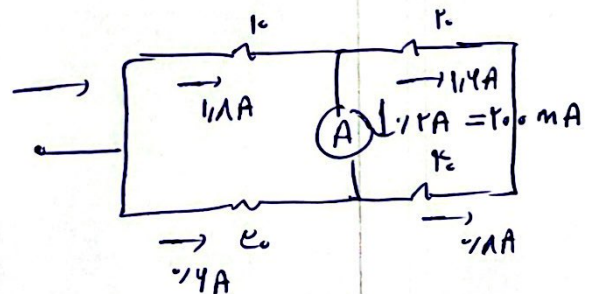
$$P = \frac{V^2}{R} \xrightarrow{V=2} \frac{P_r}{P_l} = \frac{R_l}{R_r} = \left(\frac{r_r}{r_l}\right)^2 = \left(\frac{99}{100}\right)^2 \approx \frac{98}{100}$$

$$R = \frac{PL}{A}$$

تقریباً ۲٪ کاهش

$$R_{eq} = \frac{1\omega}{2} + \frac{4}{2} = \frac{4\omega + 8}{2} = \frac{14\omega}{2} \Omega \quad (47) \quad (48)$$

$$I_{eq} = \frac{\omega_0}{\frac{14\omega}{2}} = 2.14 \text{ A}$$



$$(49) \quad (50)$$

$$F = BIL \sin \theta = 1.73 \text{ N} \quad (51) \quad (52)$$

$$(53) \quad (54)$$

$$\mathcal{E} = BLv \xrightarrow{v \text{ و } B} \mathcal{E}_c = \mathcal{E}_f > \mathcal{E}_r = \mathcal{E}_l$$

$$(55) \quad (56)$$

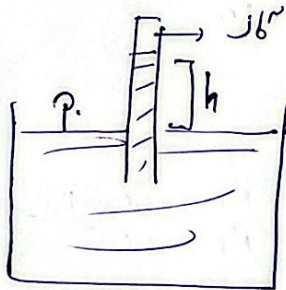
استاد: مجتبیٰ نکوئیان

پاسخ تشریحی فیزیک رشته ریاضی

$$\frac{v_r}{v_l} = \frac{A_l}{A_r} = \left(\frac{r_l}{r_r}\right)^2 = \left(\frac{c}{\omega}\right)^2 = \frac{9}{16} = \frac{c^2}{16}$$

(VI)
(1)

۲۴٪



$$P_0 = \rho g h + P_{\text{gas}}$$

$$101325 \text{ Pa} = 1000 \text{ kg/m}^3 \left(\frac{10}{100}\right) + P_{\text{gas}}$$

$$\rightarrow P_{\text{gas}} = 11400 \text{ Pa}$$

$$Q = mc \Delta \theta \rightarrow$$

$$(A) : 1800 = 2 C_A (2) \rightarrow C_A = 450 \frac{\text{J}}{\text{kg} \cdot ^\circ\text{C}}$$

$$(B) : 1200 = 1 C_B (2) \rightarrow C_B = 600 \frac{\text{J}}{\text{kg} \cdot ^\circ\text{C}}$$

$$(C) : 2000 = \frac{c}{1} C_C (4) \rightarrow C_C = 500 \frac{\text{J}}{\text{kg} \cdot ^\circ\text{C}}$$

$$\rightarrow C_B > C_C > C_A$$

(VII) انرژی رونی تابش را مطلق گان طاق ۱.

(2)

$$v_l = v_r \rightarrow \frac{P_l}{T_l} = \frac{P_r}{T_r} \rightarrow \frac{v_{\text{rms}}}{\sqrt{2}} = \frac{v_{\text{rms}}}{T_r}$$

(2) (V)

$$\rightarrow T_r = 291.4 \text{ K} \rightarrow \theta_r = 18.4^\circ\text{C}$$