

استاد: مجتبیٰ نکونیان

پاسخ تشریحی فیزیک رشته تجربی

(۲) (۱۴)

(۳) (۱۵)

$$E = hf = \frac{hc}{\lambda}$$

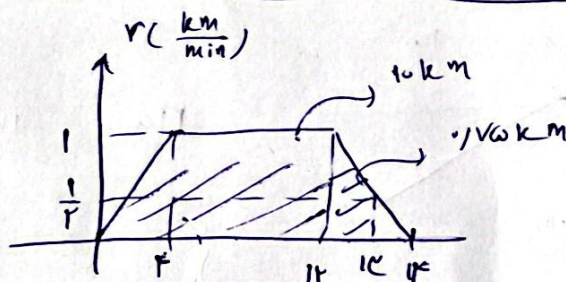
$$\frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1} = \frac{c}{f}$$

(۱) (۱۶)

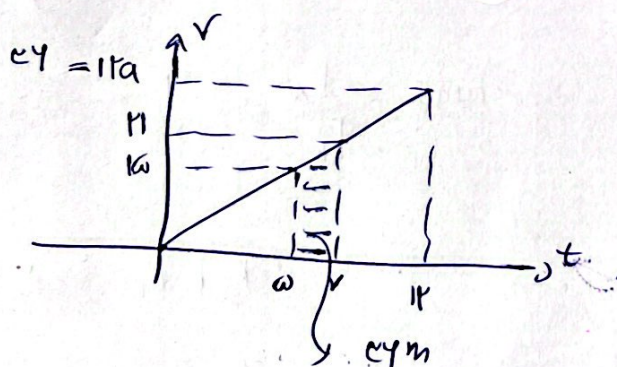
(۴) (۱۷)

سپید - بنفش

(۲) (۱۸)



(۳) (۱۹)

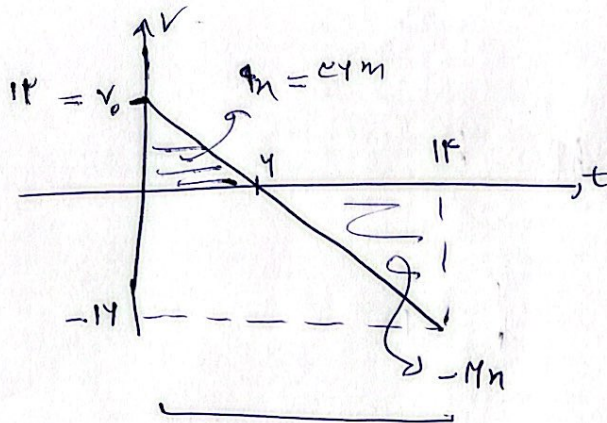


$$\frac{12 \times 12 a}{2} = 144 \rightarrow a = 12 m/s^2$$

①

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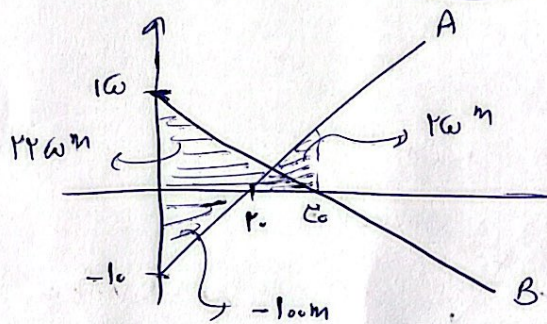
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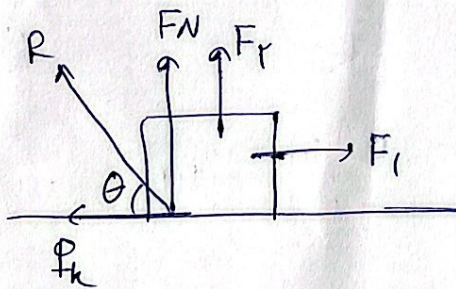
$$k = \frac{\Delta v}{\Delta t} = \frac{4}{5} \rightarrow k^2 = \frac{16}{25}$$

$$\Delta x = -v_{av} = -2.8 \rightarrow k = 4m$$

$$v_{av} = \frac{12 - 14}{5} = -\frac{2}{5} \rightarrow |v_{av}| = \frac{2}{5}$$



$$25m - (-25m) = 50m$$

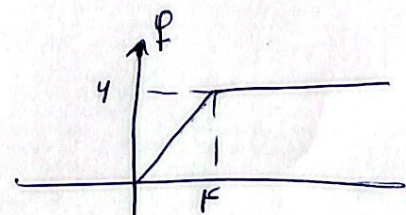


$$\tan \theta = \frac{F_N}{F_f} = \frac{1}{\mu_k} \rightarrow \theta = \tan^{-1}(\mu_k)$$

یعنی زاویه θ بین R و F

$$F = \frac{c}{p} t = F_{s, \max} = \frac{1}{2}(c) = 4 \rightarrow t = 4s$$

$$F_k = \mu_k \cdot F_N = (\frac{1}{2})(c) = 4N$$



②

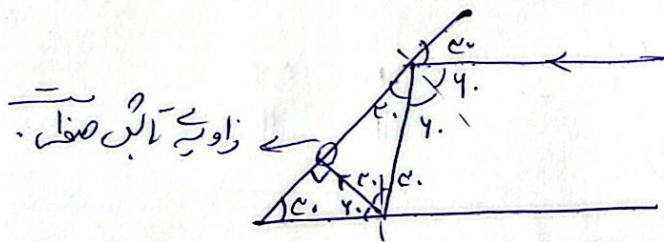
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پاسخ تشریحی فیزیک رشته تجربی

$$g = \frac{GM}{r^2} \rightarrow \frac{g_2}{g_1} = \frac{M_2}{M_1} \times \left(\frac{r_1}{r_2}\right)^2 \quad (2) \quad (52)$$

$$= 2 \times \left(\frac{1}{2}\right)^2 = \frac{1}{2}$$

$$\rightarrow \frac{\omega_2}{\omega_1} = \frac{1}{2}$$



$$\omega = \sqrt{\frac{k}{m}} = \sqrt{\frac{200}{1}} = 10 \text{ rad/s}$$

$$E = \frac{1}{2} m \omega^2 A^2 = (1) (10^2 \times 10^{-4}) = 10^{-2} \text{ J}$$

$$k = \frac{1}{2} m v^2 = \frac{1}{2} (1) (1.41)^2 = 10^{-2} \text{ J}$$

$$\rightarrow U = E - k = 10^{-2} \text{ J}$$

$$v_m = A\omega = A\left(\frac{2\pi}{T}\right)$$

$$1.41 = \frac{v \times 10^{-2} \left(\frac{2 \times 3.14}{T}\right)}{1}$$

$$\rightarrow T = 0.1 \text{ s}$$

$$v = \sqrt{\frac{F}{\rho A}}$$

$$1 = \frac{v}{\phi}$$

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© (4)

$$P_t = \frac{nhc}{\lambda}$$

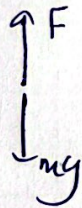
$$\rightarrow 44 \times 10^{-9} \text{ (W)} = \frac{n (44 \times 10^{-9}) (3 \times 10^8)}{4 \times 10^{-7}}$$

$$\rightarrow n = 1.1 \times 10^{10}$$

$$\frac{1}{\lambda_1} = R \left(\frac{1}{\lambda_\infty} - \frac{1}{\lambda_4} \right)$$

$$\rightarrow \frac{\lambda_1}{\lambda_2} = \frac{c_4}{11}$$

$$\frac{1}{\lambda_2} = R \left(\frac{1}{\lambda_\infty} - \frac{1}{\lambda_4} \right)$$

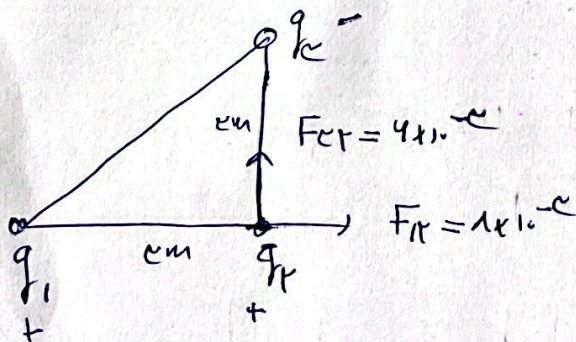


$$\frac{q_e (c q^2)}{q} = v_1 \omega \times 10^{-9} \times 10$$

$$\rightarrow q = \omega \times 10^{-11} \text{ C}$$

$$c q = 1 \omega \times 10^{-11} \text{ C} = n (1.4 \times 10^{-19})$$

$$\rightarrow n = 9.1 \times 10^7$$



$$\frac{F_{er}}{F_{fr}} = \frac{19 \text{ e}}{19 \text{ f}} \times 1 = \frac{c}{f}$$

$$\rightarrow \frac{q_c}{q_f} = \frac{c}{f}$$

(f)

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پاسخ تشریحی فیزیک رشته تجربی

$$R = \frac{\rho L}{A} \longrightarrow R = \frac{\rho L^2 d}{m} \quad \text{طال} \quad (4) \quad (4\omega)$$

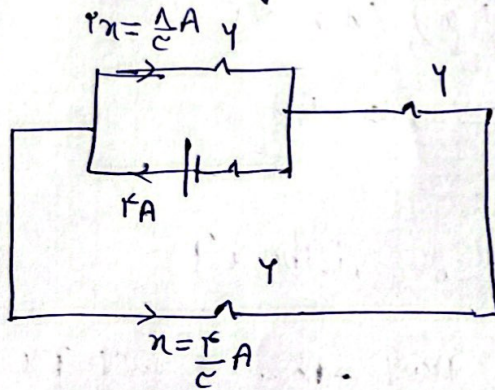
$$\frac{R_A}{R_B} = r \times l \times c \times \frac{m_B}{m_A} \longrightarrow \frac{m_A}{m_B} = 4$$

$$R_{eq} = 9 \Omega \longrightarrow R_T = 4 \Omega$$

(5) (4)

$$I = \frac{\mathcal{E}}{R_{eq} + r} = \frac{r}{r} = 1A \longrightarrow I_T = 1A \longrightarrow P_T = 4W$$

حالت = ؟

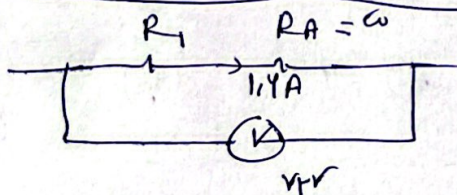


$$R_{eq} = 4 \Omega$$

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

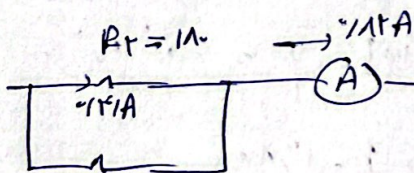
$$P_T' = 4 \left(\frac{14}{4} \right) = \frac{14}{1} W$$

$$\longrightarrow P_T' - P_T = \frac{14}{1} - \frac{14}{4} = \frac{11}{4} W$$



$$r_T = (R + \omega) / \left(\frac{1}{\omega} \right) \longrightarrow R_1 = 4 \Omega$$

(6) (5)

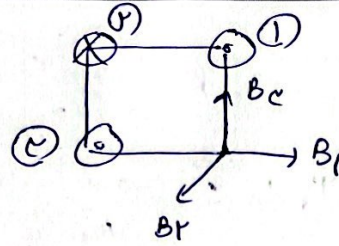


$$\longrightarrow R_T = 18 \Omega$$

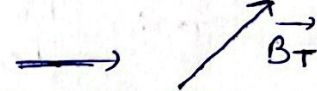
$$I = \frac{V_{18}}{18} = \frac{18}{18} = 1A$$

(7) (6)

ω



$$B_r < B_l = B_c$$



$$\bar{I} = -\frac{N}{R} \frac{\Delta B}{\Delta t} A \cos \theta = -\frac{r_{00}}{R} \frac{(-\omega r_{00}^2)}{r_{00}^2} \times \omega r_{00}^2 = 112 \omega A$$

$$m = \rho V \rightarrow r_0 = \frac{c_0}{v \pi} \left(\frac{f}{c} \pi \right) (1 \alpha^c - \alpha^c)$$

$$\rightarrow \alpha^c = 1 \rightarrow \alpha = 1 \text{ cm}$$

$$P_A = P_B \rightarrow \rho_1 g h_1 + P_{\text{atm}} = \rho_2 g h_2 + P_0$$

$$\rightarrow P_{\text{atm}} - P_0 = 11 \omega 4 - 11 \omega 0 = -\omega 4 \rho a$$

$$\div 11 \omega, \quad P_g = -11 \omega 4 H g = -F_{\text{mm}} H g$$

$$W_t = \Delta k = \frac{1}{I} (r_0) (r_0 \omega^2 - \omega^2) = 4000 \text{ J} = 4 \text{ kJ}$$

$$W_t = \Delta k = W_{\text{mg}} \rightarrow -m(10) h_f = \frac{1}{I} m (12^2 - 2^2)$$

$$\rightarrow h = 12.1 \text{ m}$$

$$\Phi = P t = m L v \rightarrow 2000 t = 15 (22 \omega 4) (1000)$$

$$\rightarrow t = 15.9 \text{ min}$$

(4)