

$$v_{max} = A\omega, \quad \omega = \frac{2\pi}{T} \quad (49)$$

$$\Rightarrow T = \frac{2\pi A}{v_{max}} = \frac{2\pi \times 1 \times 10^{-2}}{4 \times 10^{-1}} = 7.1 \text{ s}$$

(۲) صحیح

$$v = \sqrt{\frac{F}{\mu}} \quad F \uparrow \Rightarrow v \uparrow \quad (4)$$

$$\lambda = Tv \uparrow \Rightarrow \lambda \uparrow$$

(۲) صحیح

$$p = \frac{E}{t} = \frac{nhc}{\lambda t} \quad (41)$$

$$\Rightarrow n = \frac{p\lambda t}{hc} = 1.2 \times 10^6 \quad (۲) صحیح$$

$$\frac{1}{\lambda_{max}} = R \left(\frac{1}{r_0} - \frac{1}{r_y} \right) \rightarrow \lambda_{max} = \frac{r_0 \times r_y}{11R} \quad (4r)$$

$$\frac{1}{\lambda_{min}} = R \left(\frac{1}{r_0} - \frac{1}{\infty} \right) \rightarrow \lambda_{min} = \frac{r_0}{R}$$

$$\frac{\lambda_{max}}{\lambda_{min}} = \frac{r_0 \times r_y}{11R} \times \frac{R}{r_0} = \frac{r_y}{11} = \frac{4}{11} \quad (۱) صحیح$$

(4r) صحیح و یان بعد اول کتاب درست

$$F_e = mg \Rightarrow \frac{q \times 10^{-9} \times q}{4\pi \times 10^{-6}} = 1 \times 10^{-11}$$

$$\Rightarrow q = 10^{-11}$$

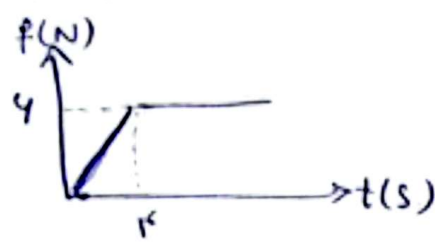
$$3q = ne \Rightarrow n = \frac{3 \times 10^{-11}}{1.6 \times 10^{-19}} = 1.875 \times 10^8$$

$$x^2 = 9.15 \times 10^8 \quad (۲) صحیح$$

$$P_{S_{max}} = \mu_s \cdot F_N = 0.2 \times 20 = 4 \text{ N} \quad (42)$$

$$P_k = \mu_k \cdot F_N = 0.1 \times 20 = 2 \text{ N}$$

$$P_k = \mu_k \cdot F_N = 0.2 \times 20 = 4 \text{ N}$$



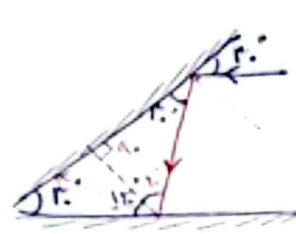
$$F = 1/2 at \rightarrow 0 \leq t \leq 2 \quad F < P_{S_{max}}$$

در ۲ ثانیه (مضرب) و بعد از ۲ ثانیه (مضرب)

(۱) صحیح است.

$$w = \frac{GM}{R^2} \quad (44) \quad (۲) صحیح$$

$$\frac{w_{max}}{w_{min}} = \frac{M_{max}}{M_{min}} \times \left(\frac{R_{min}}{R_{max}} \right)^2 = 2 \times \left(\frac{1}{2} \right)^2 = \frac{1}{2}$$



(4r) صحیح

$$4^\circ \rightarrow 2^\circ \rightarrow 0^\circ \quad \checkmark$$

$$E = K + U \quad (45) \quad (۱) صحیح$$

$$\Rightarrow U = E - K = 44 - 114 = -70 \text{ J}$$

$$E = \frac{1}{2} k A^2 = \frac{1}{2} \times 200 \times (4 \times 10^{-2})^2 = 1.6 \text{ J}$$

$$K = \frac{1}{2} m v^2 = \frac{1}{2} \times 2 \times (1.4)^2 = 1.96 \text{ J}$$

(4v) $\frac{r}{r}$

$$V_r = (R_1 + r) \times I_1 \quad \text{سؤال الف}$$

$$\Rightarrow R_1 = 10 \Omega$$

$$I = \frac{V_r}{10} = 1.41$$

$$\Rightarrow R_r = 10 \Omega$$

(4n) قانون رست و جریان معياري

(1) $\frac{r}{r}$

(4a) $\frac{r}{r}$

$$\mathcal{E} = -N \frac{\Delta \Phi}{\Delta t}$$

$$I = \frac{-N \Delta B \cos \theta}{A \Delta t} = 1.25 A$$

$$V = \frac{K}{r} n ((r \omega)^2 - (\omega)^2) = \frac{K n \omega^2}{r} (r^2 - 1)$$

$$V = \frac{m}{\rho} = \frac{K x_1 + I g r}{\frac{r_0}{v n}} = \frac{K n \pi}{r}$$

$$\Rightarrow V = 1 \text{ cm}$$

(4v) $\frac{r}{r}$

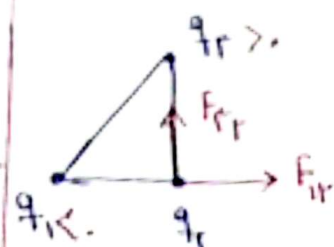
$$P_A = P_B \Rightarrow P_1 + P_{\text{ش}} = P_r + P_2$$

$$\Rightarrow \frac{10 \times 1.4 \times 1}{10} + P_{\text{ش}} = \frac{10 \times 1.4 \times 2}{10} + P_2$$

$$\Rightarrow P_2 - P_{\text{ش}} = 9.8 - 10.8 = -1 \text{ mW}$$

$$\frac{F_{rr}}{F_{lr}} = \frac{K A_r A_l}{K A_l A_r} \times \frac{(r_r)^2}{(r_l)^2}$$

$$\frac{4 \times 10^{-2}}{1 \times 10^{-2}} = \frac{19.1}{19.1} \Rightarrow \frac{19.1}{19.1} = \frac{r}{r}$$



$$\frac{q_{rr}}{q_{lr}} = -\frac{r}{r}$$

(2) $\frac{r}{r}$

$$m = \rho V \xrightarrow{V=AL} m = \rho A L$$

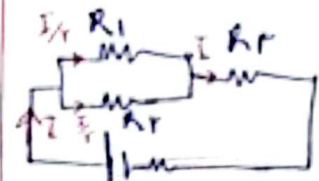
$$\frac{m_A}{m_B} = \frac{\rho_A}{\rho_B} \times \frac{A_A}{A_B} \times \frac{L_A}{L_B} = (4)$$

$$R = \rho \frac{L}{A} \Rightarrow R \propto A \Rightarrow \frac{A_A}{A_B} = \frac{P_A}{P_B} = 2$$

(2) $\frac{r}{r}$

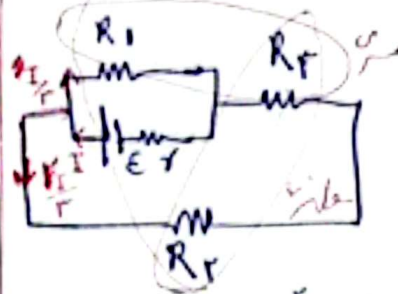
$$R_{eq} = 4 \Omega \quad R_r = 4 \Omega \quad (44)$$

$$P_r = R_r I^2 = 4(1)^2 = 4 \text{ W}$$



$$I = \frac{\mathcal{E}}{R_{eq} + r} = 2 \text{ A}$$

$$I_1 = I_2 = 1 \text{ A}, I_r = 2 \text{ A}$$



$$I = \frac{\mathcal{E}}{R_{eq} + r}$$

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

$$P_r = R_r I_r^2 = 4 \times \frac{1}{4} = 1 \text{ W}$$

$$\Delta P = \frac{r}{r} - 4 = \frac{1}{4} \text{ W}$$

(2) $\frac{r}{r}$

$$w_t = \Delta K$$

② $\frac{1}{2} \sqrt{r}$

$$w_f = \frac{1}{f} m (v_r^i - v_i^i)$$

$$w_b = \frac{1}{r} (r \cdot \omega^r - \omega^r) = 4000 \text{ j} \\ = 4 \text{ kJ}$$

$$\Delta K + \Delta U = 0$$

(15) v_{avg} (15)

$$\frac{1}{r} m (v_r^f - v_i^f) + m g (h_f - \cdot) = \cdot$$

$$1r_A = 1.0 \text{ g} \Rightarrow \boxed{h = 1r_A \text{ m}}$$

$$p = \frac{Q}{t} = \frac{mLv}{t}$$

① $\frac{1}{2} \sqrt{2}$

$$\Rightarrow t = \frac{m l v}{p} = \frac{r \times r \times \theta \times \dots}{r \dots}$$

$$\Rightarrow t = 121.85 \frac{\div 4}{\div 4} \text{ V2, r min}$$