

۰۹۳۴۹۰۳۶۴۹۲

بانج شمر نو ۱۱ سنبه (نوب دوم)

لندن جسته

سره ۱۴.۲

۴ (۴۱)

$$W = P \times t = mgh$$

۳ (۴۲)

$$۳۰ \times ۴\% = ۴\% \times ۱۰ \times h \rightarrow h = ۳.۰ \text{ m}$$

$$۲۵ \text{ cm} \text{ ارتفاع هر يك} = ۰.۲۵ \text{ m} = \frac{1}{4} \text{ m} \rightarrow \frac{۳.۰}{\frac{1}{4}} = ۱۲.۰$$

۳ (۴۳)

$$\frac{۴۵}{\text{min}} \times \frac{۳۶}{18} \times \frac{1 \text{ min}}{۶۰} = \frac{۹۰ \times ۳}{10} = \frac{۳۶}{۲}$$

۲ (۴۴)

$$\frac{K_r}{K_i} = \frac{m_r}{m_i} \times \left(\frac{v_r}{v_i} \right)^2$$

۳ (۴۵)

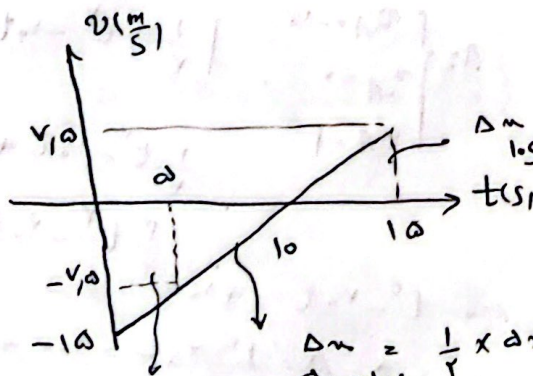
$$\frac{1.25 K_i}{K_i} = \frac{m_r}{5} \times \left(\frac{1.25 \times 1.25 v_i}{v_i} \right)$$

$$5 = m_r \times 1.25 \rightarrow m_r = 4 \text{ Kg} \rightarrow \Delta m = 4 - 5 = -1 \text{ Kg}$$

ب شمر نو ۱۱ سنبه

$$u = \frac{۳}{۴} t^2 - 10t + ۳۰$$

$$v = 1.5t - 10$$



$$\Delta u = \frac{1}{2} \times 5 \times v_{15} = 11.75$$

$$\Delta u = \frac{1}{2} \times 5 \times \frac{10}{2} = 11.75$$

$$\Delta u = \frac{v_{15} + 10}{2} \times 5 = 59.25 \text{ m}$$

$$\frac{0 \rightarrow 5}{10 \rightarrow 15} = \frac{-57.25}{11.75} = ۳$$

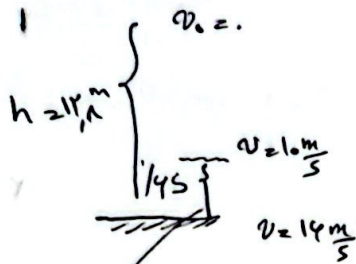
۱ (۴۶)

$$x = K(t-2)(t-5)$$

$$\text{at } t=0, x=2 \rightarrow 2 = K(-2)(-5) \\ \rightarrow K=2$$

$$x = 2(t-2)(t-5) = 2t^2 - 12t + 10$$

$$v = 4t - 12 \rightarrow v = 4 \frac{m}{s} \text{ at } t=5$$



$$y = -\frac{1}{2}gt^2 + v_0 t$$

$$-1.8 = -at^2 \rightarrow t^2 = 2.07$$

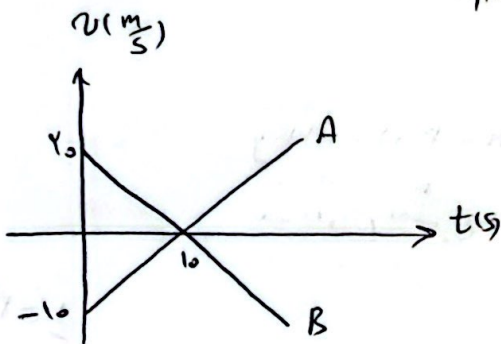
$$t = 1.75 \rightarrow v = -gt + v_0$$

$$v = 1.4 \frac{m}{s}$$

$$\Delta y = \frac{v_1 + v_2}{2} \Delta t$$

$$\Delta y = \frac{1.0 + 1.4}{2} \times \frac{4}{10} = 1.18$$

$$1.8 - 1.18 = 0.62$$



$$x_{0A} = x_{0B} = 0$$

$$|x_A - x_B| = 1.0$$

$$B: \begin{cases} v_{0B} = 1. \\ a_B = -2 \end{cases}$$

B

$$A: \begin{cases} v_{0A} = -1. \\ a_A = 2 \end{cases}$$

$$\left| \frac{1}{2}at^2 - 1.0t - \frac{1}{2}(-2)t^2 + 1.0t \right| = 1.0$$

$$\frac{1}{2}t^2 - 1.0t + t^2 - 1.0t = \pm 1.0$$

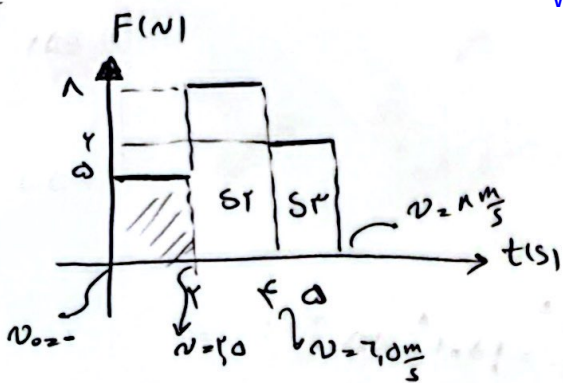
$$\frac{3}{2}t^2 - 2.0t = \pm 1.0$$

$$\frac{1}{2}t^2 - 1.0t = \pm 1.0 \rightarrow t^2 - 2.0t = \pm 2.0$$

$$t^2 - 2.0t - 2.0 = 0 \rightarrow \Delta = b^2 - 4ac = 4.0 + 16.0 = 20.0 \rightarrow \sqrt{20.0} \rightarrow 4.47$$

$$t^2 - 2.0t + 2.0 = 0 \rightarrow \Delta = b^2 - 4ac = 4.0 - 16.0 = -12.0 \rightarrow \text{no real solution}$$

درد - 1.0



$$F = ma$$

$$a = \frac{F}{m} = \frac{F}{k}$$

$$F = \frac{\Delta p}{\Delta t} = \frac{m \Delta v}{\Delta t}$$

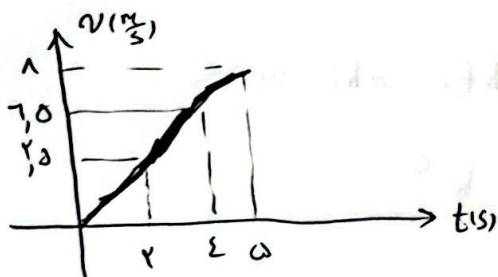
$$F \cdot \Delta t = m \Delta v$$

f(a)

$$S_1 = 10 \rightarrow 10 = F \Delta v \rightarrow \Delta v = 1,0 \rightarrow v_{t=1s} = 1,0 \frac{m}{s}$$

$$S_2 = 14 \rightarrow 14 = F \Delta v \rightarrow \Delta v = 2 \rightarrow v_{t=2s} = 2,0 \frac{m}{s}$$

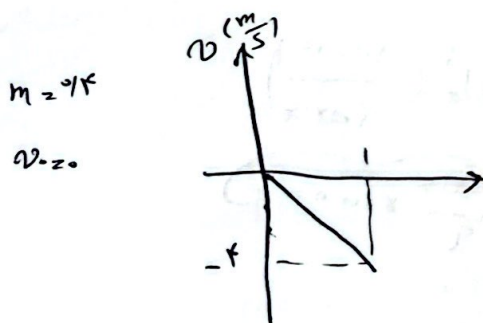
$$S_3 = 4 \rightarrow 4 = F \Delta v \rightarrow \Delta v = 1,0 \rightarrow v_{t=3s} = 1,0 \frac{m}{s}$$



$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{1-0}{1-0} = 1,0 \frac{m}{s^2}$$

مسئله حرکت

f(a)



$$m = 10$$

$$v_0 = 0$$

$$v = -gt + v_0$$

$$v = -10t$$

$$p = mv = 10 \times (-10t) \Rightarrow p = -100t$$

r(a)

$$\alpha = 10 \text{ rad/s}^2$$

$$m = 10 \text{ kg}$$

$$\omega = 10 \times 1 = 10 \text{ rad/s} \rightarrow T = \frac{1}{10} \text{ s}$$

r(a)

$$\begin{cases} E = \frac{1}{2} m \omega^2 A^2 \\ U = \frac{1}{2} m \omega^2 x^2 \end{cases}$$

$$K = \frac{1}{2} m \omega^2 (A^2 - x^2)$$

$$K = \frac{1}{2} \times 10 \times 100 \times 100 \times (1 - 0)$$

$$K = \frac{1}{2} \times 1000 \times 100 \times 1 = 50000 \text{ J}$$

1 (52)

$$x = ct$$

$$\lambda = cT = \frac{c}{f}$$

$$\frac{3\lambda}{2} = 400 \rightarrow \lambda = 266.67 \text{ nm} \approx 267 \text{ nm}$$

$$f = \frac{c}{\lambda} = \frac{3 \times 10^8}{266.67} = 1.125 \times 10^{12} \text{ Hz}$$

2 (56)

چون فریب دیت نورانی که نوروز ← فزاین انفراف نورانی (B) است

از طرف چون نور از محیط خلط وارد محیط رقیق شده برآز خط عمود در می شود

3 (57)

$$\begin{cases} K_{\max} = hf - hf_0 = hf - W_0 \\ K_{\max} = h \frac{c}{\lambda} - h \frac{c}{\lambda_0} \end{cases}$$

1 (58)

$$\frac{1}{\lambda} = R_H \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

نور آبی در طیف مرئی $\frac{1}{\lambda} = 10^6 \left(\frac{1}{14} - \frac{1}{\infty} \right) \rightarrow \lambda_1 = 1400 \text{ nm} \quad (n_1 = 2, n_2 = \infty)$

بلندترین طول موج $\frac{1}{\lambda} = 10^6 \left(\frac{1}{14} - \frac{1}{25} \right) \sim \frac{1}{\lambda} = 10^6 \left(\frac{25-14}{25 \times 14} \right)$

$$\begin{aligned} n_1 &= 2 \\ n_2 &= 5 \end{aligned}$$

$$\lambda_2 = \frac{25 \times 14}{9} \times 100 \text{ nm}$$

$$\frac{\lambda_2}{\lambda_1} = \frac{25}{9}$$

2 (59)

$$1 + 245 = 133 + 101 + n$$

$$n = 2$$

$$m_1 > m_2$$

$$\rho = \frac{m}{V} = \frac{17 \times 10^{-28}}{\frac{4}{3} \pi (1.8 \times 10^{-17})^3} = \frac{17 \times 10^{-28}}{1.1 \times 10^{-49}} = 1.55 \times 10^{21} \frac{\text{kg}}{\text{cm}^3}$$

فشار هسته

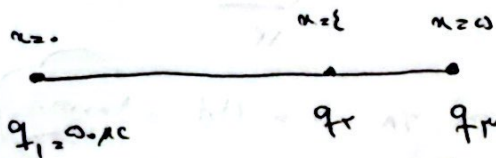
۳ (۶۱)

۲ (۶۲) خازن به باتری وصل ← V ثابت

$$\begin{cases} C = K \epsilon_0 \frac{A}{d} \\ C = \frac{q}{V} \end{cases} \rightarrow \frac{1}{\epsilon} \rightarrow \frac{1}{2}$$

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

۳ (۶۳)



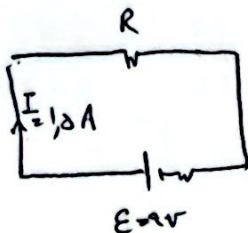
اگر بار q_1, q_2, q_3 را هم نام بماند
برای بارها داریم بار q_2 زنی صفی شود به بار q_3 خارج بار و نزدیک بار q_1 باشد
پس $q_2 < 0$ (منفی) و $|q_1| < |q_3|$ فریضای $1, 2, 3$ دور شود

$$F_{12} = F_{23}$$

$$\frac{k q_1 q_2}{r^2} = \frac{k q_2 q_3}{r^2}$$

$$\frac{50}{5^2} = \frac{q_2}{1^2} \rightarrow q_2 = -2 \mu\text{C}$$

۲ (۶۴)



$$V = E - rI$$

$$4 = 9 - 1.5r$$

$$r = 2 \Omega$$

$$P = EI - rI^2 = 9 \times 1.5 - 2 \times (1.5)^2 = 13.5 - 4.5 = 9 \text{ W}$$

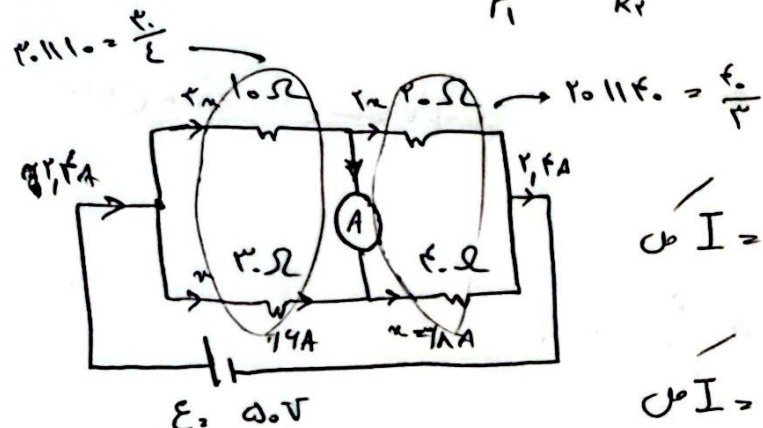
$$P = \frac{V^2}{R}$$

نسبت حساسه

$$\frac{R_r}{R_i} = \frac{P_r}{P_i} \times \frac{L_r}{L_i} \times \left(\frac{A_i}{A_r}\right) = \left(\frac{D_i}{D_r}\right)^2$$

$$\frac{R_r}{R_i} = \left(\frac{D_i}{A_i D_i}\right)^2 \rightarrow \frac{R_r}{R_i} = \left(\frac{100}{99}\right)^2$$

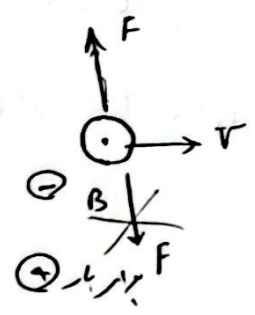
$$\frac{P_r}{P_i} = \frac{R_i}{R_r} = \left(\frac{99}{100}\right)^2 \rightarrow \text{نسبت حساسه}$$



$$I = \frac{\sum \mathcal{E}}{\sum R + \sum r} = \frac{5.0}{\left(\frac{2}{1} + \frac{4}{1} + \frac{2}{1}\right) + 0}$$

$$I = \frac{5.0}{9.0 + 1.0} = \frac{5.0 \times 12}{10} = 6.0 \text{ A}$$

$$\begin{cases} I_1 + I_2 = I_3 \rightarrow I_2 = 1.4 \text{ A} \\ I_2 + I_4 = I_3 \rightarrow I_4 = 1.8 \text{ A} \end{cases} \rightarrow 1.8 - 1.4 = 0.4 \text{ A} = 400 \text{ mA}$$



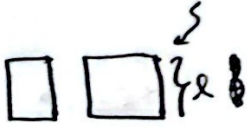
$$F = I B \sin \alpha$$

$$F = 100 \times 1 \times 10^{-4} \times 0.5 \times \sin 45^\circ$$

$$F = 10^{-2} \times 10^{-4} \times 0.5 \times \frac{1}{\sqrt{2}} = 10^{-6} \text{ N}$$



$$E = B l v$$



$$E_1 = E_2 > E_3 = E_4$$

۴ (۷۰)

$$A_1 v_1 = A_2 v_2$$

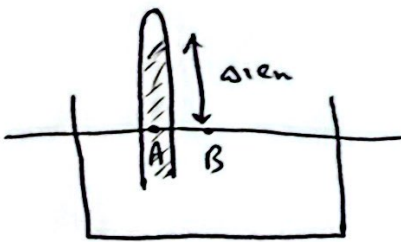
(۱) درست

مستند (۲)

۱ (۷۱)

$$\frac{A_2}{A_1} = \left(\frac{D_2}{D_1} \right)^2 = \left(\frac{1/4}{1} \right)^2 = \frac{1}{16} \quad \frac{v_1}{v_2} = \frac{A_2}{A_1} = \left(\frac{1/4}{1} \right)^2$$

۴ در صد می شود



$$P_A = P_B$$

۴ (۷۲)

$$P + \rho \Delta h = P_0 \quad (۱)$$

$$h_{cm - u_j} = \frac{\rho h}{1.4} = \frac{1.1 \times 1}{1.4} = \frac{1.1}{1.4} = 0.7857 \text{ cm}$$

$$(۱) 1.8 + \rho = 1.4 \Delta h$$

$$\rho = 1.4 \Delta h - 1.8 = 1.4 \times 0.7857 - 1.8 = 1.1 \text{ cm}$$

۱ (۷۳)

$$\frac{Q_B}{Q_A} = \frac{m_B}{m_A} \times \frac{c_B}{c_A} \times \frac{\Delta \theta_B}{\Delta \theta_A}$$

$$\frac{1}{1} = \frac{1}{1} \times \frac{c_B}{c_A} \times \frac{1}{1} \rightarrow \frac{c_B}{c_A} = \frac{1}{1} = 1 \rightarrow c_A > c_B$$

$$\frac{Q_B}{Q_C} = \frac{m_B}{m_C} \times \frac{c_B}{c_C} \times \frac{\Delta \theta_B}{\Delta \theta_C} \rightarrow \frac{1}{1} = \frac{1}{1} \times \frac{c_B}{c_C} \times \frac{1}{1} \rightarrow \frac{c_B}{c_C} = \frac{1}{1} = 1 \rightarrow c_B > c_C$$

$$c_A > c_B > c_C$$

۲ (۷۴)

۲ (۷۵)

فشار ثابت
بیابان

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$\frac{(75+0)}{273} = \frac{(75+0)}{T_2}$$

$$\frac{10}{273} = \frac{10}{T_2}$$

$$T_2 = 309.1 \text{ K}$$

$$\theta_2 = 309.1 - 273 = 36.1^\circ \text{C}$$

نسبت چیست
۰۹۳۶۹-۳۶۴۹۲