

۱۴۰۵

یادگیری سریع و آسان - شرفیاد

(۲) (۴۱)

$$A = 211$$

$$Z = 84$$

$$X = \frac{4}{2} \alpha + \frac{2.7}{12} \gamma$$

$$q = ne$$

$$1,342 \times 10^{-17} = n \times 1,2 \times 10^{-19}$$

$$n = 111.83$$

برابر تعداد پروتون هسته

$$207 - 84 = 123$$

(۴) (۴۲)

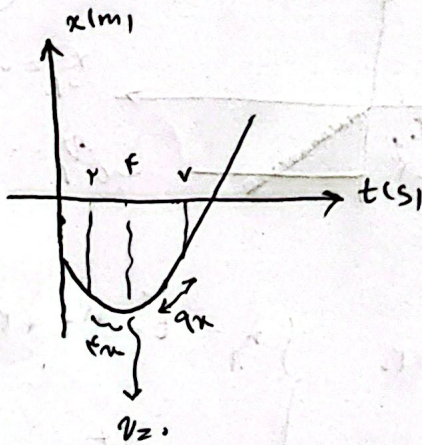
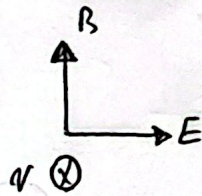
(۲) (۴۳)

میدان القدر داخل رانها صاف است

(۳) (۴۴)

مضامین فاعله دست راست

(۳) (۴۵)



$$\bar{v} = \frac{\Delta x}{\Delta t} \rightarrow 0.175 = \frac{\Delta x}{6-2}$$

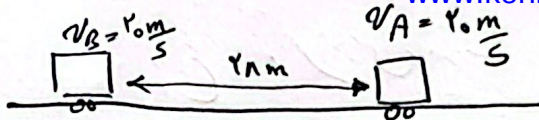
$$\Delta x = 0.7 \times \frac{4}{2} = \frac{1.4}{2} = 0.7 \text{ m}$$

$$\bar{v} = \frac{0.7 - 0}{6-2} = \frac{0.7}{4} = 0.175$$

$$\bar{s} = \frac{0.7 + 0}{2} = 0.35$$

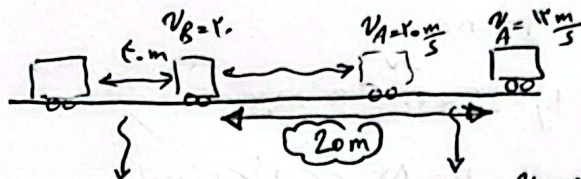
(۲) (۴۶)

1. 0



1. 0

(f) (fv)



$$v = at + v_0$$

$$v = -1 \times t + 10 = 10 \frac{m}{s}$$

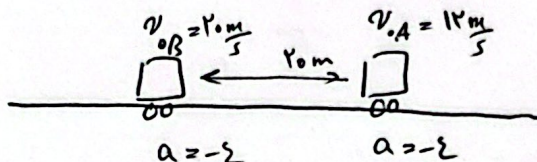
المسافة

$$x = vt$$

$$x = 10 \times t = 10 \text{ m}$$

$$\Delta x = \frac{v_0 + v}{2} \Delta t$$

$$\Delta x = \frac{10 + 10}{2} \times t = 10 \text{ m}$$

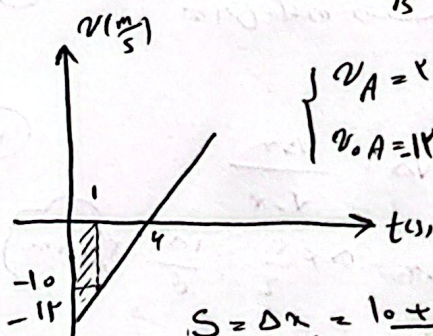


$$x_A = x_B \rightarrow \frac{1}{2} (-1) t^2 + 10t + 10 = \frac{1}{2} (-1) t^2 + 10t + 0$$

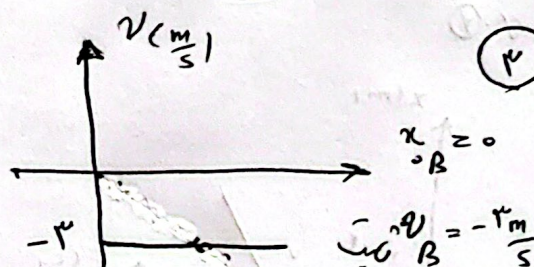
$$10t = 10 \rightarrow t = 1 \text{ s}$$

المسافة بين A و B

$$v_B = at + v_0 \rightarrow v_B = (-1)(1) + 10 = 9 \frac{m}{s}$$



$$S = \Delta x_A = \frac{10 + 9}{2} \times 1 = 9.5 \text{ m}$$



$$x_A = x_B + \Delta x \rightarrow 9 = x_B - 11 \rightarrow x_B = 20$$

t = 1s

$$\begin{cases} x_A = t^2 - 10t + 10 \\ x_B = -t^2 \end{cases}$$

$$|x_A - x_B|$$

$$|t^2 - 9t + 10| \leq 10 \rightarrow -10 \leq t^2 - 9t + 10 \leq 10$$

$$t^2 - 9t + 10 = 0$$

$$(t-2)(t-5) = 0$$

$$\Delta t = 3$$

۳

$$v_0 = 0 \rightarrow 10 \text{ m}$$

$$15 \rightarrow 20 \text{ m}$$

$$15 \rightarrow 30 \text{ m}$$

$$15 \rightarrow 40 \text{ m}$$

$$15 \rightarrow 50 \text{ m}$$

$$15 \rightarrow 60 \text{ m}$$

مستقیم

$$v_5 \rightarrow v_5 = 30 + 20 + 10 = 60 \text{ m}$$

مستقیم

$$v_5 \rightarrow v_5 = 40 + 10 = 50$$

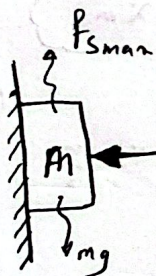
مستقیم

$$\frac{130}{100} = \frac{13}{10}$$

$$W = \frac{v \cdot r}{T}$$

$$T = 12 \text{ h} = 720 \text{ min}$$

$$T = 1 \text{ min}$$



$$f_s = \mu_s F_N = \mu_s F$$

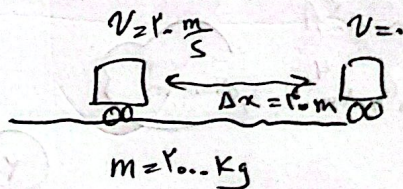
$$f_{smax} = mg$$

با فرض f_s و F به سمت راست
فرض f_s و F به سمت راست
فرض f_s و F به سمت راست

$$f_s = mg$$

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

تندتر از روبرو
تندتر از روبرو



$$R = \sqrt{f_k^2 + F_N^2}$$

$$0 - f_k = ma \rightarrow 0 - \mu_k mg = ma \rightarrow a = -\mu_k g$$

$$v - v_0 = a \Delta x \rightarrow 0 - 2 = a \times 10 \rightarrow a = -0.2 \frac{\text{m}}{\text{s}^2}$$

$$a = -\mu_k g \rightarrow \mu_k = 0.2$$

$$f_k = \mu_k mg = 0.2 \times 200 = 40 \text{ N}$$

$$F_N = mg = 200 \text{ N}$$

$$R = \sqrt{f_k^2 + F_N^2} = \sqrt{(40)^2 + (200)^2} = \sqrt{1600 + 40000} = \sqrt{41600} = 204 \text{ N}$$

(1) (54)

$$\beta_r - \beta_i = 1.0 \lg \frac{I_r}{I_i} = 1.0 \lg \frac{n}{r_r}$$

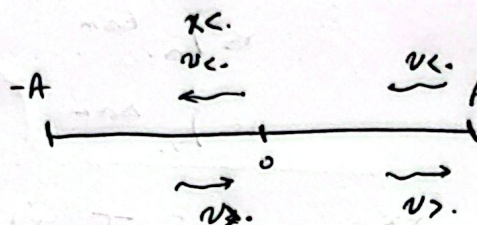
$$\beta_i - \beta_r = 1.0 \lg \frac{r_r}{r_i} \rightarrow 45 - \beta_r = 1.0 \lg \frac{100}{10}$$

$$45 - \beta_r = 1.0 \lg 10$$

$$45 - \beta_r = 1.0 \rightarrow \beta_r = 44 \text{ dB}$$

$$\alpha = 0.4 \text{ Gs } \omega \cdot t$$

$$\omega = 500 = \frac{2\pi}{T} \rightarrow T = \frac{2\pi}{500}$$



$$\left(\frac{1}{2} \right) \frac{2\pi}{T} \rightarrow \frac{T}{2} = \frac{2\pi}{500} \div 2 = \frac{2\pi}{1000} \text{ s} \times 10^3 = 2 \text{ ms}$$

$$f = \frac{nv}{2l}$$

$$v = \sqrt{\frac{F}{\mu}} = \sqrt{\frac{F}{P \cdot A}}$$

$$n = 2$$

$$f = 250 \text{ Hz}$$

$$F = 200$$

$$l = 0.1 \text{ m}$$

$$P = 50 \frac{\text{g}}{\text{cm}^2}$$

$$250 = \frac{2 \times v}{2 \times 0.1} \rightarrow v = 25 \frac{\text{m}}{\text{s}}$$

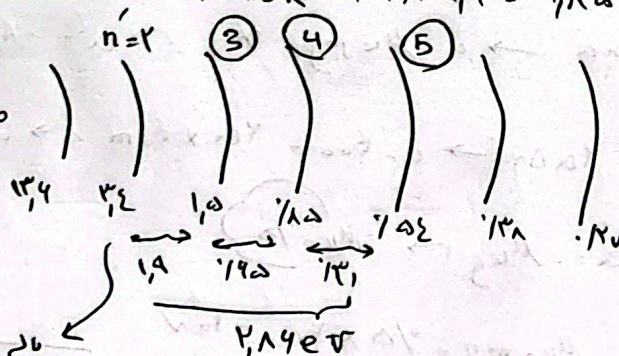
$$v = \sqrt{\frac{F}{P \cdot A}} \rightarrow 25 = \sqrt{\frac{200}{50 \times 10^{-3} \times A}}$$

$$25 \times 10^3 = \frac{200}{50 \times 10^{-3} \times A} \rightarrow 25 \times 10^3 \times A = 200$$

$$A = 1.6 \times 10^{-4} \text{ m}^2 = 1.6 \text{ mm}^2$$

اختلاف انرژی

$$0.1 \times 1.6 \times 10^{-4} = 1.6 \times 10^{-5}$$



$$n = 2 \text{ سری بالمر}$$

$$n < 7 \rightarrow \text{فرانیه}$$

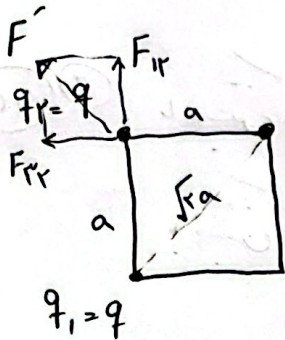
$$K_{max} = hf - w_0 = h \frac{c}{\lambda} - w_0$$

$$K_{max} = \frac{1}{2} m v^2 = \frac{1}{2} \times 9 \times 10^{-31} \times 4.8 \times 10^6 = 1.1 \text{ eV}$$

$$1.1 = \frac{1240 \text{ eV nm}}{\lambda} - 2.2 \rightarrow \lambda^{ev} = \frac{1240 \text{ eV nm}}{\lambda}$$

$$\lambda = 310 \text{ nm}$$

(2) 54



$$F_{12} = F_{34} = \frac{k q^2}{a^2}$$

$$F_{13} = \frac{k q^2}{2 a^2}$$

(1) 59

$$F_{12} \text{ and } F_{34} = \sqrt{2} \frac{k q^2}{a^2}$$

$$\frac{F}{F_{12}} = \sqrt{2}$$

$$v = \frac{1}{2} c v^2$$

$$\frac{v_r}{v_i} = \frac{c_r}{c_i} \left(\frac{v_r}{v_i} \right)^2 = \frac{1}{2}$$

$$c = \frac{q}{2 \pi \epsilon_0 r} \rightarrow \frac{q_r}{q_i} = \frac{1}{2}$$

(3) 4. خارج به باند وصل است

(2) 41. دو سیم موازی مقاومت R، اتصال می دهند پس مقاومت هر یک AR است

$$\frac{R_r}{R_i} = \frac{\rho_r}{\rho_i} \times \frac{l_r}{l_i} \times \left(\frac{A_i}{A_r} \right)^2 = \left(\frac{\rho_i}{\rho_r} \right)^2$$

$$\frac{R_r}{R_i} = \left(\frac{d}{d'} \right)^2 \rightarrow \frac{1}{4} = \left(\frac{d}{d'} \right)^2 \rightarrow \frac{d}{d'} = \frac{1}{2} \rightarrow d' = 2d$$

4

$$T_1 = 300^\circ\text{K} = 273 + \theta_1 \rightarrow \theta_1 = 27^\circ\text{C} \quad , \quad R_1 = 25 \Omega$$

$$\theta_2 = 300^\circ\text{C} \quad \Delta\theta = 300 - 27 = 273^\circ\text{C}$$

$$\Delta R = \alpha R_1 \Delta\theta \rightarrow \Delta R = 2 \times 10^{-4} \times 25 \times 273 = 14 \Omega$$

$$\Delta R = R_2 - R_1 \rightarrow R_2 = R_1 + \Delta R = 25 + 14 = 39 \Omega$$

$$V = RI \rightarrow I = \frac{234}{39} = 6 \text{ A}$$

(۲) (۴۳) با بستن کلید مقاومت R_3 و حذف R_4 می شود $(V_2) = 0$

$$I = \frac{\mathcal{E}}{R+r} \leftarrow \text{با بستن کلید } R_T \text{ جریان افزایش می یابد}$$

$$\uparrow (V_2) = R_2 I \uparrow \quad \downarrow (V_1) = \mathcal{E} - r I \uparrow$$

طبق قاعده دست راست، جهت انحراف ذره یون $(+)$ است

(۱) (۴۴)

$$F = qvB \sin\alpha = \frac{mv^2}{r}$$

$$m = \frac{r q B}{v} = \frac{25 \times 10^{-2} \times 1.4 \times 10^{-19} \times 200 \times 10^{-2}}{2 \times 10^6} = 500 \times 10^{-29}$$

$$m = 5 \times 10^{-27} \text{ Kg}$$

(۴) (۴۵)

$$I = I_m \sin \omega t$$

A, B, A.

(۲) (۴۶)

$$\phi = \phi_{\max} \cos \omega t$$

جریان زنی $\phi_{\max}$ است نه ϕ ، صفر است

✓

$$r = \omega cm \rightarrow A = \pi r^2 = \pi \times 25 \times 10^{-6}$$

(3) (45)

$$\theta = 4^\circ$$

$$\Delta t = \omega \cdot \mu s = 5 \times 10^{-5}$$

$$\Delta B = 1.0 \times 10^{-2} = 1 \times 10^{-2}$$

$$\bar{E} = \frac{-N \Delta \phi}{\Delta t} = \frac{-N \Delta B A}{\Delta t}$$

$$\bar{E} = \frac{1 \times 5 \times 10^{-2} \times \pi \times 25 \times 10^{-6}}{5 \times 10^{-5}}$$

$$\bar{E} = \frac{100 \pi \times 10^{-4}}{5 \times 10^{-5}} = 4\pi = 12.56$$

$$1) \rho = \frac{m}{V} = \frac{14}{1} = 14 \frac{gr}{cm^3}$$

(3) (48)

$$2) \rho = \frac{14}{1} = 14 \frac{gr}{cm^3}$$

$$3) \rho = \frac{14}{1} = 14 \frac{gr}{cm^3}$$

$$4) \rho = \frac{14}{1} = 14 \frac{gr}{cm^3}$$

دورترین خنجر از جواهر
مستند

(3) (49)

$$1) \rho = V_1 + V_2 = 18 cm^3$$

(3) (50)

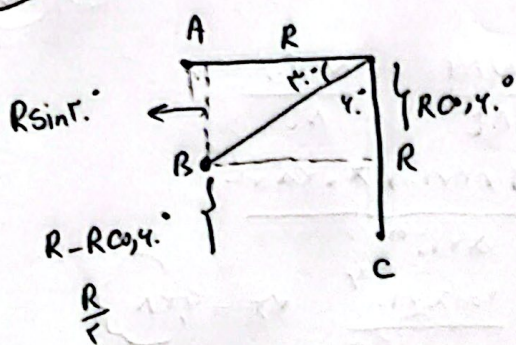
$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \rightarrow \frac{14}{V_1} \times \left(\frac{V_1}{V_2} \right) = \left(\frac{V_1}{V_2} \right) \times P_2$$

$$P_2 = 91 cm^3$$

$$41 + 10 = h + V_2 \rightarrow h = 25 cm^3$$

$$V = A \times h = 5 \cdot cm^3$$

10



$$W_t = W_{mg} + W_{P/F_k} = \Delta K$$

$$\frac{W_{mg}}{AB} = \frac{mg \frac{R}{r}}{W_{mg}} = \frac{mg \frac{R}{r}}{BC} = 1$$

(1) (VI)

$$W_{mg} = mgh = m \times 10 \times 9.0 = 900m \times 4.0\% = 900 \times \frac{4}{100} = 360m$$

$$t = 4.5$$

$$P = 400W$$

$$\frac{360m}{40} = 40 \times 1.0^4 \rightarrow 4m = 4 \times 10^4$$

$$m = 10^4 kg$$

$$R_{a\%} = \eta = \frac{\text{ران خروجی}}{\text{ران ورودی}}$$

$$V = \frac{m}{\rho} = \frac{10^4}{10^3} = 10 m^3$$

(2) (V2)

$$\Delta Q = -W = 3 \times 1.0^2 \times 4 \times 1.0^{-2} = 90 J$$

$$\Delta Q = -W = 1 \times 1.0^2 \times 4 \times 1.0^{-2} = 40 J \quad 240 - 90 = 150 J$$

(1) (V2)

$$W = W_{AB} + W_{BC} + W_{CA} = -350 + 0 + 400 = 50 J$$

(3) (V2)

$$P \cdot V = nRT \rightarrow n = \frac{P \cdot V}{RT} = \frac{4 \times 10^5 \times 24 \times 1.0^{-3}}{8.314 \times 300} = 4 \text{ mol}$$

(2) (V2)

$$\begin{cases} \text{نیتروژن} + \text{هیدروژن} = 4 \\ 2H + 2N = 4 \end{cases} \rightarrow 24N = 12$$

$$N = 0.5$$

$$H = 4H = 2, 0$$

$$\frac{m_{N_2}}{m_{H_2}} = \frac{0.5 \times 28}{2 \times 2} = \frac{14}{4} = 3.5$$