

8. [د] تنقل قيمة ثابت
فعل السلك

9. [أ] $i = \frac{BLv}{R}$

10. [أ] دوره الخاص T

11. [ج] دوري متناوب متناوب

12. [د] $i_c = I_{max} \cos(\omega t - \frac{\pi}{2})$

13. [أ] الكثرونية

14. [د] ينقلان كثافة المادة

15. [ج] شبه الخرجة

الاكثرونية

فيزياء علمي - 2025

11. [أ] تنقل الطاقة الكافية
المرونية وتزداد كرجية

12. [د] $(\theta)_t = -\frac{K}{I_d} \theta$

13. [ب] يزداد

14. [ب] غير قابل للضغط
ومعتمد اللزوجة

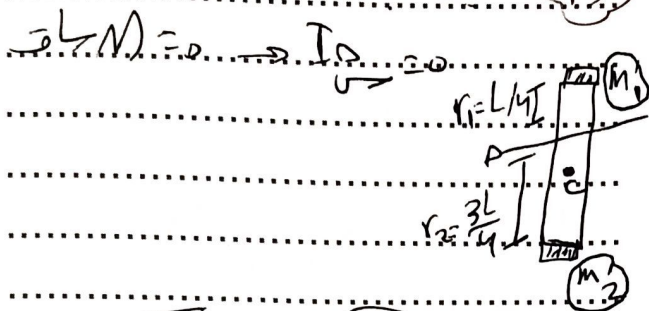
15. [ج] تنقل ثابتة مهما اختلف
جهد المنيو الضوئي
بالنسبة للمرئيت

16. [د] $\eta = \frac{Bt}{B}$

17. [ب] $a=0$
 $\lambda=0$



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$$T_0 = 2\pi \sqrt{\frac{I_0}{mgd}}$$

$$I_0 = m_1 r_1^2 + m_2 r_2^2$$

$$I_0 = m \left(\frac{L^2}{16} + \frac{9L^2}{16} \right) = \frac{10L^2}{16}$$

$$d = \frac{m_2 r_2 - m_1 r_1}{2m}$$

$$= \frac{m \left(\frac{3L}{4} - \frac{L}{4} \right)}{2m} = \frac{2L}{8} = \frac{L}{4}$$

$$2m = 2m$$

$$T_0 = 2\pi \sqrt{\frac{\frac{10L^2}{16} \cdot m}{16 \cdot 2m \cdot \frac{L}{4}}}$$

$$T_0 = 2\pi \sqrt{\frac{5L}{4g}} = \pi \sqrt{\frac{5L}{g}}$$



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$$K = 40 \text{ N.m}^{-1}$$

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

$$x_{\max} = 8 \cdot 10^{-2} \text{ m}$$

$$\omega = \sqrt{\frac{K}{m}} = 2\pi \text{ rad.s}^{-1}$$

$$v = 0, t = 0$$

$$\phi = 0 \text{ rad}$$

$$x = x_{\max} \cos(\omega t + \phi)$$

$$x = 8 \cdot 10^{-2} \cos(2\pi t)$$

$$L = n \cdot \frac{\lambda}{2}$$

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$$(2n-1) \cdot \lambda = 1$$

$$\lambda = \frac{1}{2} \Rightarrow \lambda = 2L$$



$$E_t = 2 \cdot 10^2 \text{ J}$$

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$$x_{\max} = 2 \cdot 10^{-1} \text{ m}$$

$$E_t = \frac{1}{2} K x_{\max}^2$$

$$K = \frac{2E_t}{x_{\max}^2} = \frac{2 \cdot 2 \cdot 10^2}{4 \cdot 10^{-2}} = 1 \text{ N.m}^{-1}$$

$$F = 1 - Kx$$

$$= 1 - 4 \cdot 10^2 = -4 \cdot 10^2$$

2

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$$L = (2n-1) \frac{\lambda}{4}$$

$$(2n-1) = 1 \quad \text{المرتبة الأولى}$$

$$(2n-1) = 3 \quad \text{المرتبة الثالثة}$$

$$f_1 = 435 \text{ Hz}$$

$$f = 3f_1 = 3 \cdot 435 = 1305$$

3

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$$L = 1 \text{ m} \quad m = 2 \cdot 10^{-3} \text{ kg}$$

$$\theta_{\max} = \frac{\pi}{3} \quad \theta = 0 \quad \text{نقطة التوقف}$$

$$T = m \cdot g \cdot [3 - 2 \cos(\theta_{\max})]$$

$$= 2 \cdot 10^{-3} \cdot 10 \cdot [3 - 2 \cdot \frac{1}{2}]$$

$$T = 2 \cdot [3 - 1] = 2 \cdot 2 = 4 \text{ N}$$

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$$V = 240 \text{ l} = 240 \cdot 10^{-3} \text{ m}^3 \quad 20$$

$$= 24 \cdot 10^{-2} \text{ m}^3$$

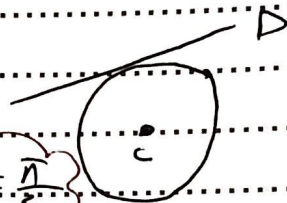
$$\rightarrow t = \frac{V}{Q} = \frac{24 \cdot 10^{-2}}{4 \cdot 10^3 \cdot 10^{-1}} = 60 \text{ s}$$

9

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$$r = \frac{1}{6} \text{ m}$$

Note: $\theta_{\max} = 90^\circ = \frac{\pi}{2}$
مساحة كبيرة



(5) لا يمر من [C] ← هايفن

$$I_0 = \frac{1}{2} m r^2 + m r^2 = \frac{3}{2} m r^2$$

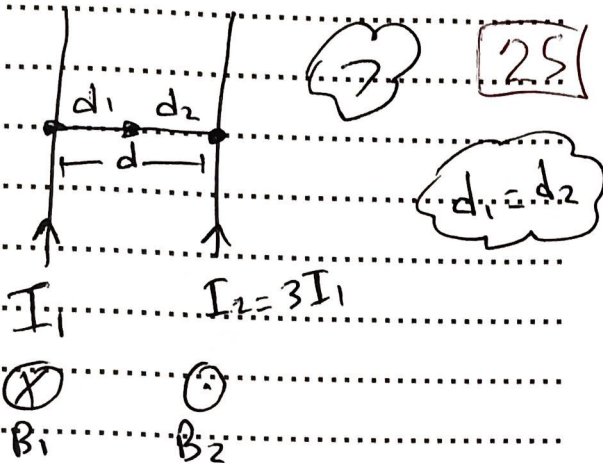
$$T_0 = 2 \pi \sqrt{\frac{3 m r^2}{2 m r g}}$$

$$T_0 = 2 \sqrt{\frac{3 \cdot 1}{2 \cdot 10}} = 2 \sqrt{\frac{1}{4}} = 1 \text{ s}$$

$$W = \sqrt{\frac{2 m g (1 - \cos \frac{\pi}{3})}{I_0}}$$

$$= \sqrt{\frac{2 \cdot m \cdot g \cdot k (\frac{1}{2}) \cdot 2}{3 m r^2}}$$

$$W = \sqrt{\frac{2 \cdot g \cdot k}{3 \cdot 1}} = \sqrt{2 \cdot 10} = 2 \frac{\text{rad}}{\text{s}}$$



$$B_t = B_2 - B_1$$

$$= \frac{2 \cdot 10^{-7}}{d} (I_2 - I_1)$$

$$= \frac{2 \cdot 10^{-7}}{d} (3I_1 - I_1)$$

$$B_t = 2 \cdot B_1$$

$$S = 16 \cdot 10^{-4} \text{ m}^2$$

$$L = 4 \cdot 10^{-2} \text{ m}$$

$$N = 10^2$$

$$B = 4 \cdot 10^{-2} \text{ T}$$

$$B \parallel S \rightarrow B \perp n$$

$$\alpha = \frac{\pi}{2}$$

$$I = 10 \text{ A}$$

$$W = I \cdot \Delta d$$

$$\alpha_1 = \frac{\pi}{2}, \alpha_2 = 0$$

$$W = I \cdot N \cdot S \cdot B \cdot [\cos \alpha_2 - \cos \alpha_1]$$

$$= 10 \cdot 10^2 \cdot 16 \cdot 10^{-4} \cdot 4 \cdot 10^{-2} \cdot [1 - 0]$$

$$W = 64 \cdot 10^{-3} \text{ J}$$

$$m = 2 m_0$$

$$\gamma = 2$$

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

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

$$\gamma^2 (1 - \frac{v^2}{c^2}) = 1$$

$$4(1 - \frac{v^2}{c^2}) = 1$$

$$1 - \frac{v^2}{c^2} = \frac{1}{4}$$

$$1 - \frac{1}{4} = \frac{v^2}{c^2}$$

$$c^2 - \frac{1}{4} c^2 = v^2$$

$$\frac{3}{4} c^2 = v^2$$

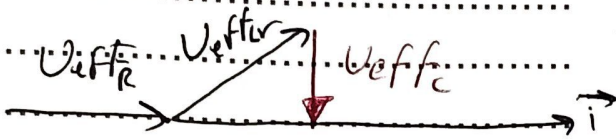
$$v = \frac{\sqrt{3}}{2} c$$

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$$F = 50 \quad L = \frac{2}{5\pi} H$$

تساوي

$$L = \frac{2}{5\pi} H$$



توافق يعني لها

$$X_L = X_C$$

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$$\omega = 2\pi \cdot 50 = 100\pi$$

$$\omega \cdot L = \frac{1}{\omega \cdot C}$$

$$\rightarrow C = \frac{1}{\omega^2 L} = \frac{1 \cdot 5\pi}{10^4 \cdot 10 \cdot 2}$$

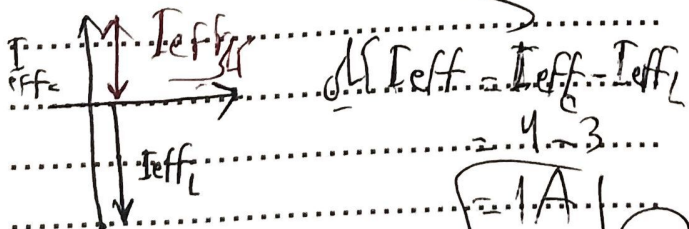
$$= \frac{\pi \cdot \pi}{4 \cdot 10^4 \pi} = \frac{\pi^2}{4 \pi \cdot 10^4}$$

$$= \frac{10}{40000\pi} = \frac{1}{4000\pi}$$

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$$L \leftrightarrow \text{تفرع}$$



$$I_{eff} = I_{eff} - I_{eff}$$

$$= 4 - 3$$

$$= 1A$$

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$$L = 10^2 H$$

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$$i = 20 - 4t$$

$$\mathcal{E} = -L \frac{di}{dt}$$

$$\mathcal{E} = -10^2 (-4) = +4 \cdot 10^2 V$$

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$$f' = 2f_0$$

$$f_0 = \frac{1}{2\pi \sqrt{L \cdot C}}$$

$$\frac{f'}{f_0} = \sqrt{\frac{C}{C'}}$$

$$\frac{2f_0}{f_0} = \sqrt{\frac{C}{C'}}$$

$$4 = \frac{C}{C'} \rightarrow C' = \frac{1}{4} C$$

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ذوخم نهائية مفقودة

$$L = (2n-1) \frac{\lambda}{4}$$

$$F = 110$$

$$v = 330$$

$$L = 1 \cdot \frac{330}{4 \cdot 110} = \frac{3}{4} \text{ m}$$

$$L = 0.75$$

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34) $m \rightarrow I_{\text{نوس قبل}}$

$$m_1 = m_2$$

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تغير الكتلة ← نهيات (ر)
نهيات (ر) ← نهيات (دور)

$$\frac{T_0'}{T_0} = \frac{2\pi \sqrt{\frac{I_0'}{k}}}{2\pi \sqrt{\frac{I_0}{k}}} = \sqrt{\frac{2mr'^2}{2mr^2}}$$

$$\frac{T_0'}{T_0} = \sqrt{\frac{(\frac{r}{2})^2}{r^2}} = \sqrt{\frac{r^2}{4r^2}}$$

$$\frac{T_0'}{T_0} = \sqrt{\frac{1}{4}} \rightarrow T_0' = \frac{1}{2} T_0$$

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31) محولة

$$v_p = 200$$

$$v_s = 5 \quad N = \frac{5}{200} = \frac{1}{40}$$

$$N_s = 100$$

$$\rightarrow N_p = \frac{N_s}{N} = \frac{100 \cdot 40}{1}$$

$$\rightarrow N_p = 4000$$

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32) وتر مشدود نهاية مفقودة

$$L = 1 \text{ m}$$

$$m = 10^{-2} \text{ kg}$$

$$F_T = 4 \text{ N}$$

$$f = 100$$

$$L = n \cdot \frac{\lambda}{2} \rightarrow L = n \cdot \frac{v}{2f}$$

$$\rightarrow L = \frac{n \cdot v}{2f} \cdot \sqrt{\frac{F_T}{m}}$$

$$\rightarrow n = \frac{L \cdot 2f \cdot \sqrt{\frac{m}{F_T}}}{v} \rightarrow \frac{1 \cdot 2 \cdot 100 \cdot \sqrt{\frac{10^{-2}}{4}}}{1} = 10^2$$

$$n = 1 \cdot 2 \cdot 100 \cdot \sqrt{\frac{10^{-2}}{4}} = 5 \text{ معادل}$$

36. الشكل ب

الدي عكس (أ)
بأجن الكف يا حياه (ب)
F عكس (ج)

37. متوازي
 $U = 12V$
 $I = 3A$

متناوب
 $U_{eff} = 40V$
 $I_{eff} = 8A$

r مقاومة كسبه من المتوازي

$$r = \frac{U}{I} = \frac{12}{3} = 4 \Omega$$

$$Z_{Lr} = \frac{U_{eff}}{I_{eff}} = \frac{40}{8} = 5 \Omega$$

$$Z_{Lr} = \sqrt{X_R^2 + X_L^2}$$

$$Z_{Lr}^2 - X_R^2 = X_L^2$$

$$25 - 16 = X_L^2 \Rightarrow X_L^2 = 9$$

$$X_L = 3 \Omega$$

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39. $r = 10 \Omega$

يا حياه

نصف العلم الفل المتأثر
F في منتصف نصف العلم



$F = 2 \cdot 10^{-3} N$

الكتلة كسبه f

أقل الكتلة

ع العزم بلا

$$W = R = 2$$

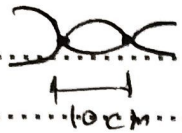
$$W_F = + F \cdot \frac{r}{2}$$

$$W_{W'} = - W' \cdot r$$

$$\Rightarrow W' \cdot r = F \cdot \frac{r}{2}$$

$$m \cdot g \cdot r = F \cdot \frac{r}{2}$$

$$m = \frac{F}{2 \cdot g} = \frac{2 \cdot 10^{-2}}{2 \cdot 10} = 10^{-3} kg$$



(39) زوج رقاب مفتوح

$$\rightarrow 10^1 = \frac{\lambda}{2} \rightarrow \lambda = 2 \cdot 10^1 \text{ m}$$

$$L = \lambda = 2 \cdot 10^1 = 20 \text{ cm}$$



(40) نوتيس

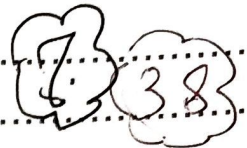
$$h = \lambda (1 - \cos \alpha)$$

$$8 \cdot 10^1 = 16 \cdot 10^1 (1 - \cos \alpha)$$

$$\frac{1}{2} = 1 - \cos \alpha$$

$$\rightarrow \cos \alpha = \frac{1}{2}$$

$$\rightarrow \alpha_{\max} = \frac{\pi}{3} \text{ rad}$$



$$U = 5 \text{ V}$$

$$C = \frac{q}{U} = \frac{10^{-6}}{2.5 \cdot 10^1}$$

$$q = \frac{1}{2} \cdot 10^{-6}$$

$$C = 10^{-4} \text{ F}$$

$$f = \frac{1}{\sqrt{L \cdot C}}$$

$$f = \frac{1}{2\pi \sqrt{10^{-4} \cdot 10^{-4}}} = \frac{1}{2\pi \cdot 10^{-4}} = \frac{10^4}{2\pi}$$

$$\omega_0 = 2\pi \cdot 10^4$$

$$I_{\max} = \omega_0 \cdot q_{\max}$$

$$I = \frac{2\pi \cdot 10^4}{2\pi} \cdot \frac{1}{2} \cdot 10^{-6}$$

$$I = \frac{10^2 \cdot 5}{2 \cdot 5} = \frac{5 \cdot 10^2}{10}$$

$$I = 5 \cdot 10^1 \text{ A}$$

