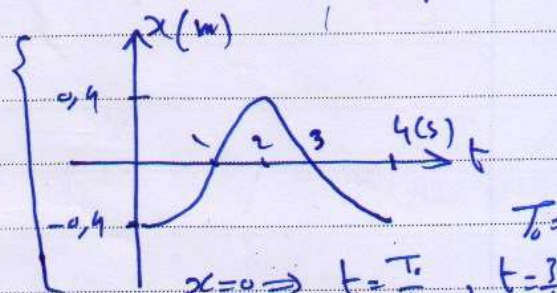
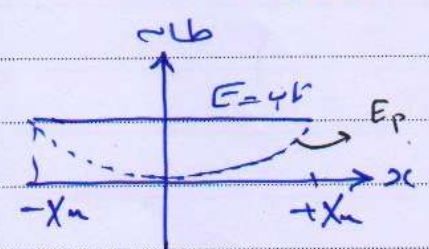


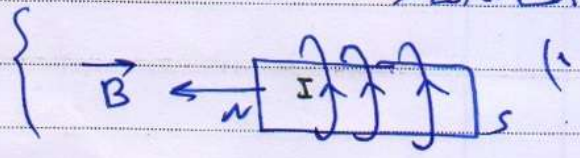
تاريخ:

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المرم	سؤال	الجواب
10	اولاً: اختر ...	<p>① C أو $\frac{1}{\sqrt{2}} kx$</p> <p>② C أو $\frac{1}{\sqrt{2}} \frac{X_{\max}}{\sqrt{2}}$</p> <p>③ b أو $\frac{1}{4} \alpha$</p> <p>④ c قوة لورنتز معدومة</p> <p>⑤ c أو $2 \phi_{\max}$</p>
5	المسألة	<p>المعادلة العددية 90</p> <p>$x = 0.4 \cos\left(\frac{\pi}{2}t - \pi\right)$</p>
5	المسألة	<p>① $\omega_0 = \frac{\pi}{2}$</p> <p>$\frac{2\pi}{T_0} = \frac{\pi}{2} \Rightarrow T_0 = 4(s)$</p> <p>$f_0 = \frac{1}{T} = \frac{1}{4} \text{ Hz}$</p>
5	المسألة	<p>② $K = \omega_0^2 m$</p> <p>$= \frac{\pi^2}{4} \times \frac{1}{2} = \frac{5}{4} \text{ N} \cdot \text{m}^{-1}$</p>
10	المسألة	<p>③ </p> <p>$T_0 = 4(s)$</p> <p>$x=0 \Rightarrow t = \frac{T_0}{4}, t = \frac{3}{4}T_0$</p>
5	المسألة	<p>④ $a = ?$ $v = ?$</p> <p>$x = 0.2 \text{ m}$ $t = 2(s)$</p>
5	المسألة	<p>$v = \dot{x} = -0.2\pi \sin\left(\frac{\pi}{2}t - \pi\right)$</p> <p>$t = 2(s) \Rightarrow v = 0$</p>
30	المسألة	<p>⑤ $E = E_p + E_k$</p> <p>$= \frac{1}{2} kx^2 + \frac{1}{2} mv^2$</p> <p>$\dot{x} = \omega X_m \cos(\omega t + \phi)$</p> <p>$\dot{v} = -\omega X_m \sin(\omega t + \phi)$</p> <p>$E = \frac{1}{2} k X_m^2 \cos^2(\omega t + \phi) + \frac{1}{2} m \omega^2 X_m^2 \sin^2(\omega t + \phi)$</p> <p>$K = m\omega^2$</p> <p>$E = \frac{1}{2} k X_m^2 = \text{ثابت}$</p> <p>اعمال القوى المتغيرة للطاقة (إرضاء عن الطاقة)</p> <p>⑥ </p>
5	المسألة	<p>⑦ $F = N(evB \sin \theta)$</p> <p>$v = \frac{L}{\Delta t}$</p> <p>$= ne \frac{L}{\Delta t} B \sin \theta$</p> <p>$q = ne$</p> <p>$= \frac{q}{\Delta t} L B \sin \theta$</p> <p>$= I L B \sin \theta$</p> <p>$\vec{F} = I \vec{L} \wedge \vec{B}$</p>

10

المجال الكهرومغناطيسي



10

$$B = 4\pi \times 10^{-7} \frac{NI}{l} \quad (2)$$

$$= 4\pi \times 10^{-7} \frac{400}{20\pi}$$

$$= 2 \times 10^{-5} \text{ T}$$

10

$$l' = 2\pi r N \quad (3)$$

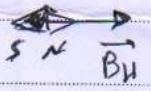
$$100\pi = 2\pi r \times 400$$

$$r = \frac{1}{8} \text{ m}$$

$$S = \pi r^2 = \frac{\pi}{64} \text{ (m}^2\text{)}$$

20

$$\vec{B} \perp \vec{B}_H \quad (4)$$

$$\tan \alpha = \frac{B}{B_H}$$


$$= \frac{2 \times 10^{-5}}{2 \times 10^{-5}} = 1$$

$$\alpha = \frac{\pi}{4} \text{ rad}$$

زاوية انحراف الحبل عن \vec{B}_H
 زاوية انحراف الحبل عن \vec{B}

10

$$\Delta \phi = ? \quad (5)$$

$$\vec{B} \perp \vec{B}_H$$

انسا، المبرهن

$$\Delta \phi = 0 \quad (\vec{B} \perp \vec{B}_H)$$

10

$$\Delta \phi = ?$$

$$\vec{B}_H \perp \vec{B}$$

$$\phi_1 = \vec{B}_H \cdot \vec{B} \cos \alpha$$

$$= \vec{B}_H \cdot \vec{B} \cos \frac{\pi}{2}$$

$$= 0$$

10

$$\begin{cases} a = -cy^2 x \\ = -\frac{\pi^2}{4} 0,2 \\ = -0,5 \text{ ms}^{-2} \end{cases}$$

10

$$\begin{cases} E_p = \frac{1}{2} k x^2 \\ = \frac{1}{2} \frac{5}{4} \times 10^{-2} \\ = \frac{5}{8} \times 10^{-2} \text{ J} \end{cases} \quad (5)$$

10

$$\begin{cases} E_k = \frac{1}{2} m v^2 \\ = \frac{1}{2} \frac{5}{4} 16 \times 10^{-2} \\ = 10 \times 10^{-2} \text{ J} \end{cases}$$

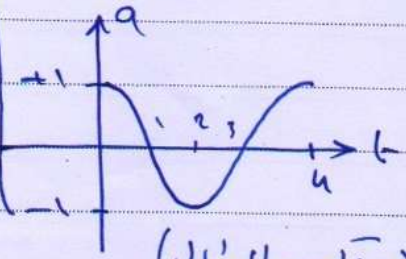
10

$$\begin{cases} E_k = (10 - \frac{5}{8}) \times 10^{-2} \text{ J} \\ = \frac{75}{8} \times 10^{-2} \text{ J} \end{cases}$$

10

$$\begin{cases} E_k = \frac{1}{2} m v^2 \\ v = \sqrt{\frac{2 \times \frac{75}{8} \times 10^{-2}}{\frac{1}{2}}} \\ v = \sqrt{\frac{75}{2}} \times 10^{-1} \text{ ms}^{-1} \end{cases}$$

90

$$a = -1 \cos\left(\frac{\pi}{2} t - \pi\right) \quad (6)$$


(مقياس الخصال)



5

$$E_k = E = \frac{1}{2} K \theta_m^2$$

$$= \frac{1}{2} \times 4 \times 10^{-1} \frac{\pi^2}{4} = \frac{1}{2} \text{ J}$$

أي $E_k = \frac{1}{2} I_0 \omega^2 = \frac{1}{2} \times 16 \times 10^{-3} \cdot \frac{25\pi^2}{4}$

$$= \frac{1}{2} \text{ J}$$

$$T_0' = \frac{1}{2} T_0 = \frac{2\pi}{10} \quad (3)$$

15

$$\frac{2\pi}{10} = 2\pi \sqrt{\frac{2 m_1 r_1^2}{K}}$$

$$(10^{-2}) = \frac{2 \times 0,2 r_1^2}{4 \times 10^{-1}}$$

$$r_1^2 = 10^{-2}$$

$$r_1 = 0,1 \text{ m}$$

10

$$\phi_2 = N B \sin \theta \cos \alpha$$

$$= 400 \times 2 \times 10^{-5} \frac{\pi}{64} \times 1$$

$$= \frac{\pi}{8} \times 10^{-3} \text{ وبت}$$

5

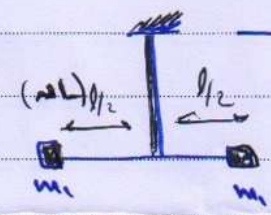
$$\Delta \phi = \phi - \phi_0$$

$$= \frac{\pi}{8} \times 10^{-3} - 0$$

$$= \frac{\pi}{8} \times 10^{-3} \text{ وبت}$$

75

المسألة الثالثة



25

$$T_0 = 2\pi \sqrt{\frac{I_0}{K}} \quad (4)$$

$$\frac{T_{02}}{T_{01}} = \sqrt{\frac{K_1}{K_2}}$$

$$K = K_1 \frac{(2r)^4}{l}$$

$$\frac{K_1}{K_2} = \frac{l_2}{l_1}$$

$$\frac{T_{02}}{T_{01}} = \sqrt{\frac{l_2}{l_1}} = \sqrt{\frac{\frac{1}{2}}{1}} = \frac{1}{\sqrt{2}}$$

$$\frac{T_{02}}{T_{01}} = \frac{1}{\sqrt{2}} \Rightarrow T_{02} = \frac{1}{\sqrt{2}} \left(\frac{2\pi}{10} \right) \frac{1}{2}$$

$$= \frac{\pi}{20} \text{ (s)}$$

15

$$T_0 = \frac{4\pi}{10} \text{ (s)}$$

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

$$I_0 = 2 m_1 r_1^2 \quad \frac{I_0}{m} = 0$$

$$= 2 \times 0,2 (0,04)$$

$$= 16 \times 10^{-3} \text{ Kg m}^2$$

$$\frac{4\pi}{10} = 2\pi \sqrt{\frac{16 \times 10^{-3}}{K}}$$

$$K = 4 \times 10^{-1} \text{ m.v. rad}^{-1}$$

$$t = \frac{T_0}{4} = \frac{4\pi}{10 \times 4} = \frac{\pi}{10} \text{ (s)} \quad (2)$$

$$\omega = -\omega_0 \theta_{\max}$$

$$\omega_0 = \frac{2\pi}{T} = \frac{2\pi}{\frac{4\pi}{10}} = 5 \text{ vds}^{-1}$$

15

$$\theta_{\max} = \frac{1}{4} \text{ rad} = \frac{1}{4} (2\pi) = \frac{\pi}{2} \text{ rad}$$

$$\omega = -5 \times \frac{\pi}{2} \text{ vads}^{-1}$$