



حل ورقة العمل

المادة ①:

① عدد الخطوط = عدد العقد = عدد العقد - 1  
 $= 5 \times 2 = 5$   
 $L = n \frac{\lambda}{2} \Rightarrow 1 = 5 \frac{\lambda}{2} \Rightarrow$   
 $\lambda = 0,4 \text{ m}$

②  $\mu = \rho S = 5000 \times 10^{-5}$   
 $= 5 \times 10^{-3} \text{ Kg m}^{-1}$

$m = \mu L = 5 \times 10^{-3} \text{ Kg}$

③  $v = \lambda f = 0,4 \times 100$   
 $= 40 \text{ ms}^{-1}$

④ هذه القطر بطول العقد



100 cm  
 فصل بين قوافض

$y_{m/w} = 2 y_{m/w} = 2 \times 1 = 2 \text{ cm}$

⑤  $F = \frac{n}{2L} \sqrt{\frac{F_T}{\mu}}$

$n \sqrt{F_T} = \text{ثابت}$

$n_1 \sqrt{F_{T1}} = n_2 \sqrt{F_{T2}}$

$v = \sqrt{\frac{F_{T1}}{\mu}}$  :  $F_{T1}$  كسب

$1600 = \frac{F_{T2}}{\frac{1}{2} \times 10^{-2}} \Rightarrow F_{T2} = 8 \text{ N}$

$5 \sqrt{8} = 1 \sqrt{F_{T2}}$

$F_{T2} = 200 \text{ N}$

المادة ②

①  $L = 3 \frac{\lambda}{4}$  بعلية ضغط  
عقدية ضغط  
بعلية عقدية  
 $30 \times 10^{-2} = 3 \frac{\lambda}{4}$   
 $\lambda = 40 \times 10^{-2} \text{ m}$

②  $v = \lambda f$  (3)

$f = \frac{340}{40 \times 10^{-2}} = 850 \text{ Hz}$

③  $f_1 = \frac{850}{3} = 283 \text{ Hz}$  رئيسية 3

④  $L = n \frac{\lambda}{2}$

$= n \frac{v}{2f}$

$= 1 \frac{330}{2 \cdot 283}$

$= 0,60 \text{ m}$

$\left\{ \begin{array}{l} \frac{2v_1}{2v_2} = \sqrt{\frac{T_1}{T_2}} \\ \frac{340}{2v_2} = \sqrt{\frac{15+275}{0+275}} \\ v_2 = 350 \text{ ms}^{-1} \end{array} \right.$

المادة ③

1)  $L = \frac{\lambda}{4}$  ,  $\lambda = \frac{v}{f} = \frac{340}{400} = 0,85$

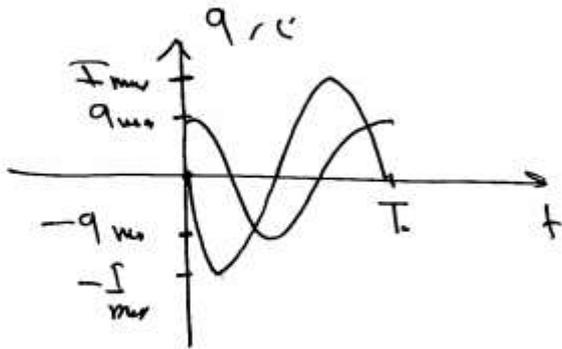
$L = \frac{0,85}{4} = 0,21 \text{ m}$

2)  $L' = \frac{\lambda}{n} + \lambda = 5 \frac{\lambda}{4} = 5 \frac{0,85}{4}$   
 $= 106 \text{ cm}$



$$c = \bar{q}'$$

$$= -10 \text{ Sa } 10^7 t$$



السعة حركية ربع متقدم  $(\frac{\pi}{2})$

$$c=0 \iff q=q_{max}$$

$$c=I_{max} \iff q=0$$

$$\lambda = \frac{c}{f} \quad (5)$$

$$= \frac{3 \times 10^8}{\frac{10^7}{2\pi}} = 60\pi \text{ (m)}$$

المثال ٤

$$L = 4\pi \times 10^{-7} \frac{\mu^2 S}{l} \quad (1)$$

$$l' = 2\pi r \mu, \quad S = \pi r^2$$

$$L = 10^{-7} \frac{\rho l^2}{l}$$

$$10^{-6} = 10^{-7} \frac{\rho l^2}{10^{-1}} \Rightarrow l' = 1 \text{ (m)}$$

$$2) \quad \mathcal{E} = -L \frac{di}{dt}$$

$$= -10^{-6} (4t)$$

$$= -4 \times 10^{-6} \text{ V}$$

$$U_{max} = \frac{q_{max}}{C} = \frac{10^{-6}}{10^{-8}} = 100 \text{ V} \quad (2)$$

(2)

$$T_c = 2\pi \sqrt{LC}$$

$$= 2\pi \sqrt{10^{-6} \cdot 10^{-8}}$$

$$= 2\pi \times 10^{-7} \text{ (s)}$$

$$f_c = \frac{10^7}{2\pi} \text{ Hz}$$

$$\frac{I_{max}}{q_{max}} = \omega_0 \quad (3)$$

$$\omega_0 = 2\pi f_c = 2\pi \frac{10^7}{2\pi} = 10^7 \text{ vds}^{-1}$$

$$I_{max} = 10^7 \times 10^{-6} = 10 \text{ A}$$

$$q = q_{max} \cos \omega_0 t \quad (4)$$

$$\bar{q} = 10^{-6} \cos 10^7 t \text{ كولوم}$$