

### Problema n° 3

$$y = 0,30(m) \sin(0,25x) \cos(120\pi t) \quad \begin{array}{l} \text{con } x \text{ en (m)} \\ t \text{ en (seg)} \end{array}$$

Onda estacionaria del tipo

$$y(x, t) = 2A_0 \sin(kx) \cos(\omega t)$$

Que es la resultante de dos ondas progresivas

$$y_1(x, t) = A_0 \sin(kx - \omega t)$$

$$y_2(x, t) = A_0 \sin(kx + \omega t)$$

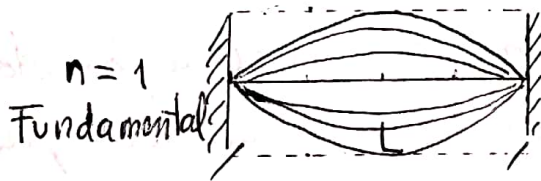
$$\text{con } 2A_0 = 0,30(m) \rightarrow A_0 = \underline{0,15(m)}$$

$$k = \frac{2\pi}{\lambda} = 0,25(m^{-1}) \rightarrow \lambda = \frac{2\pi}{0,25} = \underline{25,12(m)}$$

$$\omega = 2\pi f = 120\pi \rightarrow f = \frac{120\pi}{2\pi} = \underline{60 \text{ Hz}}$$

### Problema n° 4

Cuerda fija en ambos extremos de longitud  $L = 120\text{cm}$   $f_4 = 120\text{Hz}$



$$f_1 = v/2L = \frac{1}{2} \frac{v}{L} = \frac{60}{2}$$

$$\lambda_1 = 2L$$

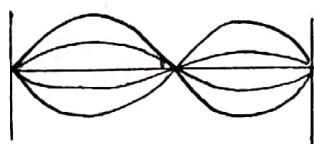
$$f_1 = 30\text{Hz}$$

$$f = \frac{n v}{2L} \quad (n = 1, 2, 3, \dots)$$

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

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

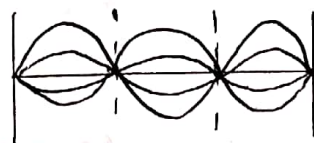
$n=2$



$$f_2 = v/L = 60\text{Hz}$$

$$\lambda_2 = L$$

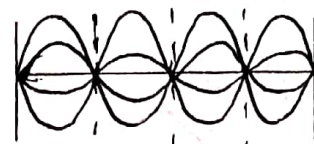
$n=3$



$$f_3 = 3v/2L = 90\text{Hz}$$

$$\lambda_3 = \frac{2}{3}L$$

$n=4$



$$f_4 = 2v/L = 120\text{Hz} \rightarrow \frac{v}{L} = \frac{120}{2} = 60$$

$$\lambda_4 = L/2 = \frac{120\text{cm}}{2} = \underline{60\text{cm}}$$