


PAUTA P1 - C1 - 2006 :

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a) Se considera modelo ideal del transformador.

i) En este caso se tiene que la razón de transformación es: 2:1

luego referido al primario se tiene:


 $12,1 \cdot 2^2 = 48,4 \Rightarrow I' = 4,54 \text{ referido al primario}$
 $I'' = 9,08 \text{ al secundario.}$

$$\Rightarrow J_{1,2} = \frac{4,54 \text{ [A]}}{1,5 \text{ [mm}^2\text{]}} = 3,0303 \left[\frac{\text{A}}{\text{mm}^2} \right]$$

$$J_3 = \frac{9,08 \text{ [A]}}{3,0 \text{ [mm}^2\text{]}} = 3,0303 \left[\frac{\text{A}}{\text{mm}^2} \right]$$


$$\Rightarrow \left[J_1 = J_2 = J_3 = 3,03 \left[\frac{\text{A}}{\text{mm}^2} \right] \right] \quad (1)$$

$$V' = 4,44 \cdot f \cdot A_w (N_1 + N_2) \cdot B_{\text{max}}$$

$$\Rightarrow B_{\text{max}} = \frac{V'}{4,44 \cdot f \cdot A_w (N_1 + N_2)} = 1,2234 \text{ [T]} = \left[\frac{\text{Wb}}{\text{m}^2} \right]$$

$$\Rightarrow \left[B_{\text{max}} = 1,2234 \text{ [T]} \right] \quad (2)$$

ii) En este caso:


 $12,1 \Rightarrow I' = 18,1818 \text{ [A]} \Rightarrow I'' = 18,1818 \text{ [A]}$
 $\hookrightarrow \text{Sale de la fuente}$

$$\Rightarrow \text{Por cada enrutado: } \frac{I'}{2} = I_{\text{enr}} = 9,0909 \text{ [A]}$$

$$\Rightarrow J_{1,2} = \frac{9,0909 \text{ [A]}}{1,5 \text{ [mm}^2\text{]}} = 6,0606 \left[\frac{\text{A}}{\text{mm}^2} \right]$$

$$J_3 = \frac{18,1818 \text{ [A]}}{3 \text{ [mm}^2\text{]}} = 6,0606 \left[\frac{\text{A}}{\text{mm}^2} \right]$$

$$\Rightarrow \left[J_3 = 2 \cdot J_1 = 2 \cdot J_2 = 6,0606 \left[\frac{\text{A}}{\text{mm}^2} \right] \right] \quad (3)$$

$$\beta_{\max_{1,2}} = 2 \cdot \beta_{\max} = 2,4969 \text{ [T]}$$

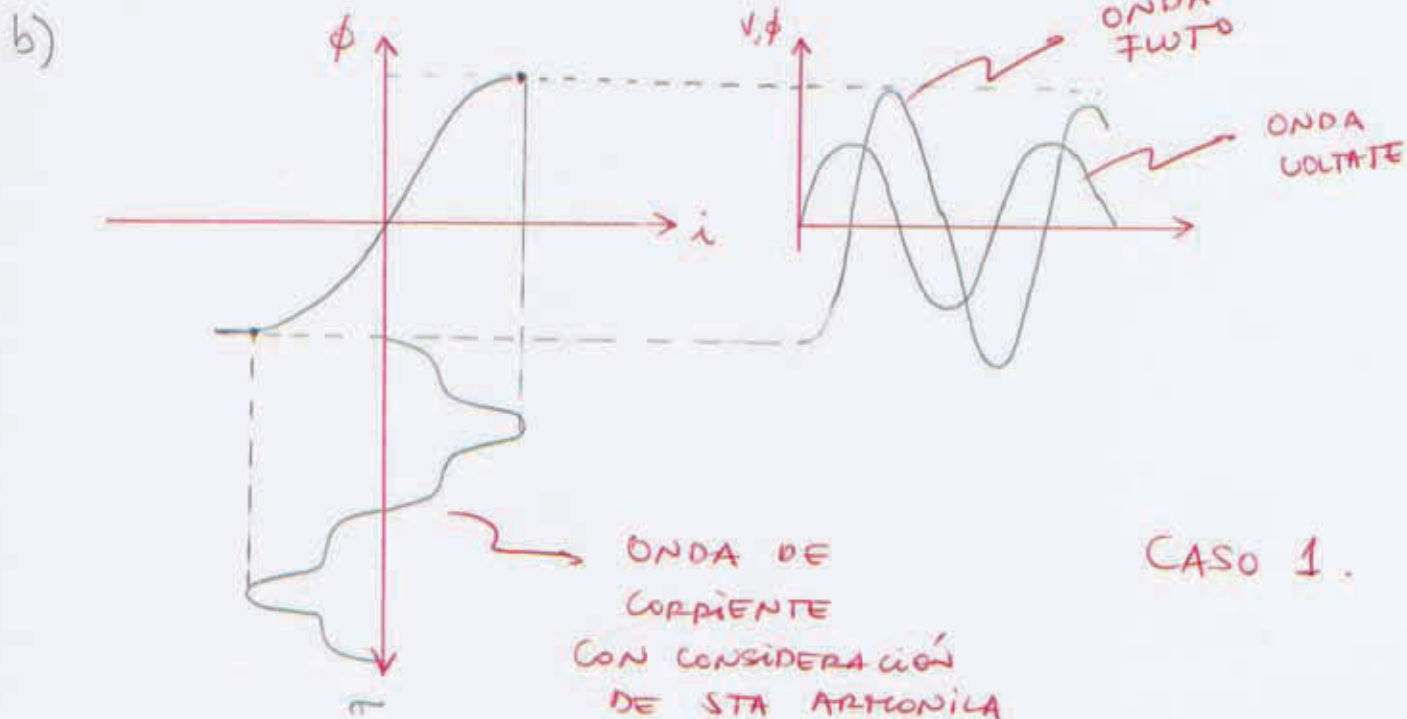
CASO
ANTERIOR

$$\text{Wego del Nucleo} \Rightarrow \left[\beta_{\max} = 2,4969 \text{ [T]} \right] \quad (4)$$

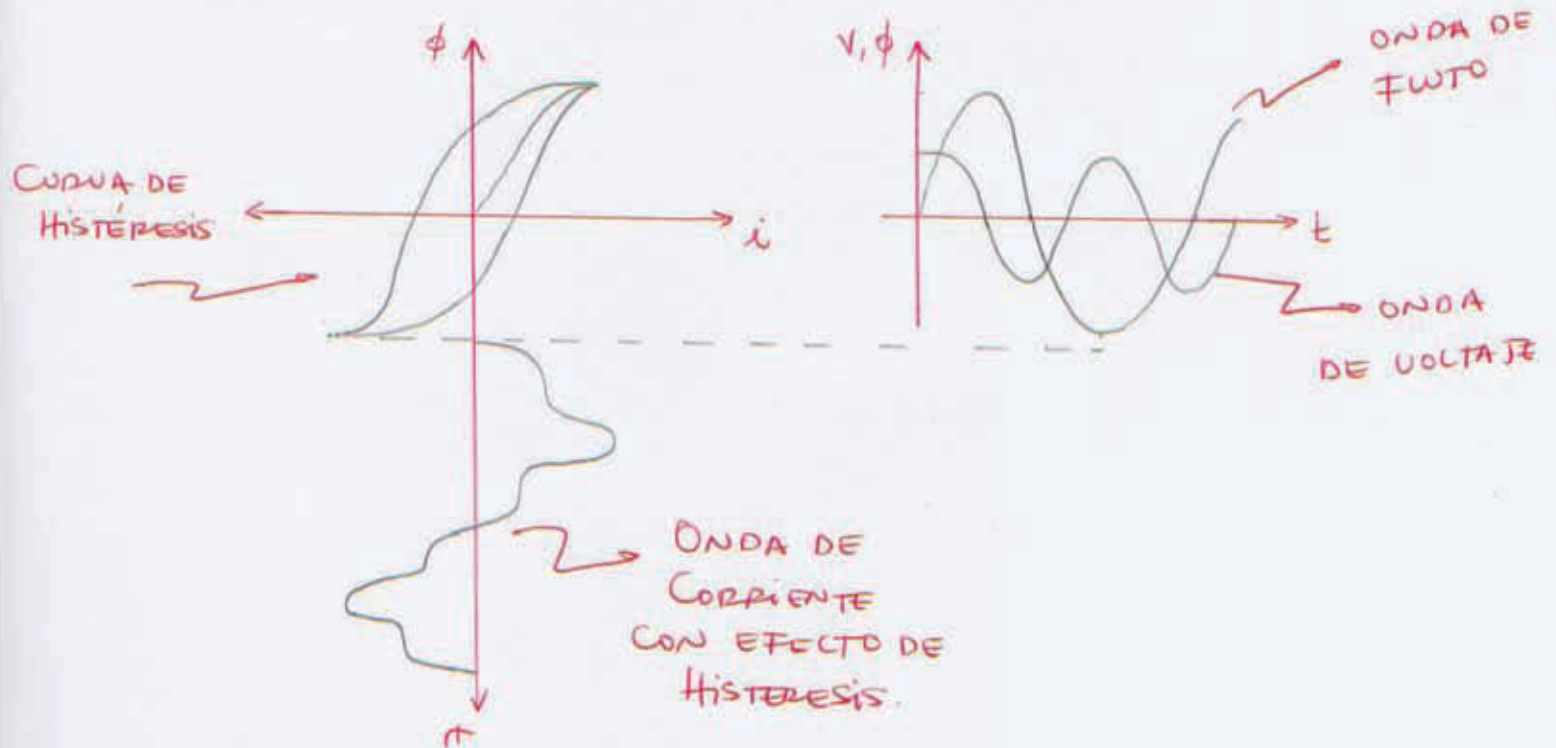
iii) En este caso

$$\Rightarrow \phi = 0 \Rightarrow \beta_{\max} = 0$$

$$I = 0$$



SEGUNDO CASO:



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