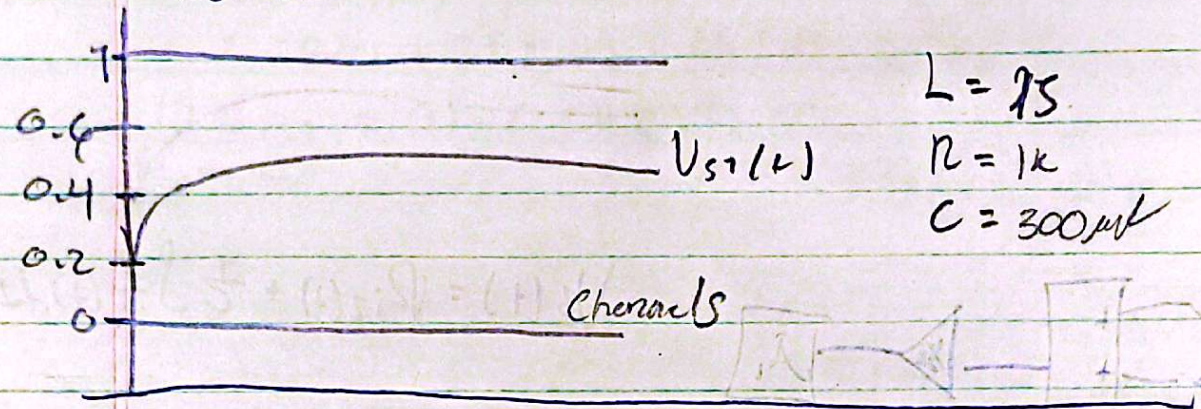
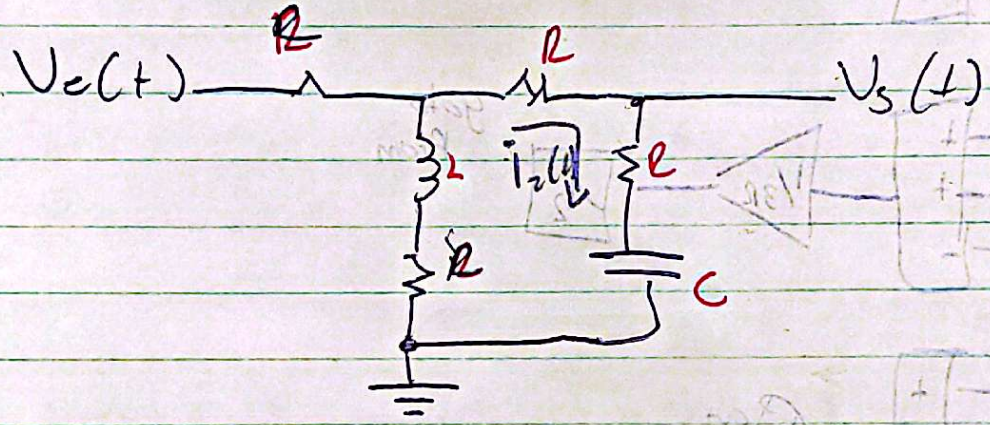
Practica #1 Modelado

Señal



$L = 15$
$R = 1k$
$C = 300\mu F$



Ecuaciones principales suma algebraica = $2Ri_1(t)$

$$V_e(t) = \underline{Ri_1(t)} + L\frac{d[i_1(t)-i_2(t)}{dt} + R[i_1(t)-i_2(t)]$$

$Ri_1(t) - Ri_2(t)$

$$L\frac{d[i_1(t)-i_2(t)]}{dt} + R[i_1(t)-i_2(t)] = Ri_2(t) + Ri_2(t) + \frac{1}{C}\int i_2(t)dt$$

$3Ri_2(t)$

$$V_s(t) = Ri_2(t) + \frac{1}{C}\int i_2(t)dt$$

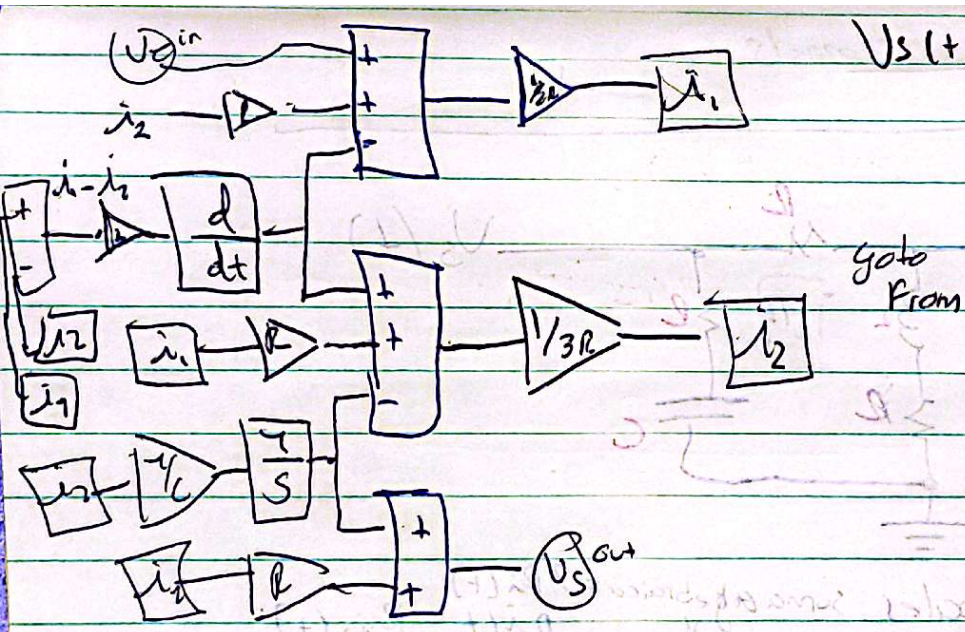
$$i_1(t) = \left[V_e(t) - L\frac{d[i_1(t)-i_2(t)]}{dt} + Ri_2(t)\right]\frac{1}{2R}$$

$$i_2(t) = \left[L\frac{d[i_1(t)-i_2(t)]}{dt} + Ri_1(t) = \frac{1}{C}\int i_2(t)dt\right]\frac{1}{3R}$$

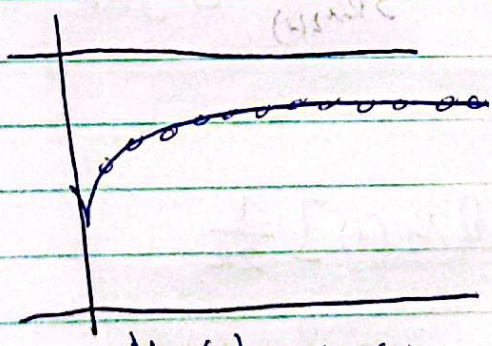
$$V_s(t) = Ri_2(t) + \frac{1}{C}\int i_2(t)dt$$

Modelo de Ecu. integro - diferencial

$$V_s(t) = R i_2(t) + \frac{1}{C}\int i_2(t)\,dt$$



Señal



$V_{s1}(t)$ y $V_{s3}(t)$

Transformada de la Place

$$V_c(s) = RI_1(s) + LS[I_1(s) - I_2(s)] + R[I_1(s) - I_2(s)]$$

$$= 2RI_1(s) + LSI_1(s) - LSI_2(s) - RI_2(s)$$

$$(2R + LS)I_1(s) - (LS + R)I_2(s)$$

$$LS[I_1(s) - I_2(s)] + R[I_1(s) - I_2(s)] = 2RI_2(s) + \frac{I_2(s)}{CS}$$

$$LSI_1(s) - LSI_2(s) + RI_1(s) - RI_2(s) = 2RI_2(s) + \frac{I_2(s)}{CS}$$

$$LSI_1(s) + RI_1(s) = LSI_2(s) + 3RI_2(s) + \frac{I_2(s)}{CS}$$

$$(LS + R)I_1(s) = \left(LS + 3R + \frac{1}{CS}\right)I_2(s)$$

$$I_1(s) = \frac{CLS^2 + 3CRS + 1}{CS(LS + R)} I_2(s)$$

$$V_s(s) = \left(R + \frac{1}{CS}\right)I_2(s) = \frac{CRS + 1}{CS} I_2(s)$$

Proce. Alge

$$V_e(s) = (2R + LS)\left(\frac{CLS^2 + 3CRS + 1}{CS(LS + R)}\right) I_2(s)$$

$$- (LS + R) I_2(s)$$

$$V_e(s) = \left[\frac{(2R + LS)(CLS^2 + 3CRS + 1)}{CS(LS + R)} - (LS + R)\right] I_2(s)$$

$$= \left\{\frac{(2R + LS)(CLS^2 + 3CRS + 1) - CS(LS + R)(LS + R)}{CS(LS + R)}\right\}$$

$CLS^2 + CRS$

$6LR^2S$

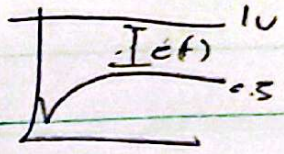
$$= 2CLRS^2 + 6CR^2S + 2R + CL^2S^3 + 3CLRS^2 + LS \ldots$$

$$- CL^2S^3 - CLRS^2 - CLRS^2 - CR^2S \quad I_2(s)$$

$$CS(LS + R)$$

$$V_e(s) = 3CLRS^2 + (5CR^2 + L)S + 2R \; I_2$$

$$CS(LS + R)$$



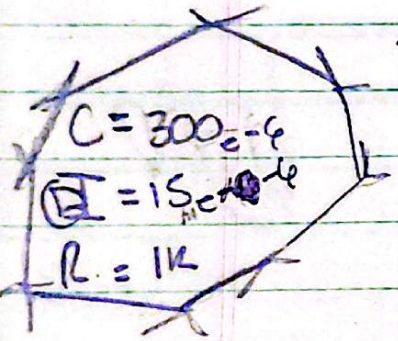
$$\frac{V_s(s)}{V_e(s)} = \frac{\frac{CRS+1}{CS} \cdot I_2(s)}{\frac{3CLRS^2+(3CR^2+1)S+2R}{CS(LS+R} \cdot I_2(s)}$$

$$\frac{CLRS^2+CR^2S+LS+R}{(CRS+1)(LS+R)} \quad \begin{matrix} C \\ [300E-6) \cdot \end{matrix} \begin{matrix} I \\ (15E-3) \cdot \end{matrix} \begin{matrix} R \\ (1E3), \end{matrix} (300E-6) \cdot (1E3)^{\wedge 2} + 15E-3, 1E3]$$

$$\frac{3(LRS^2+(3CR^2+L)S+2R} = \frac{CLRS^2+(CR^2+L)S+R}{3(LRS^2+(3CR^2+L)S+2R}$$

(1)

$$\xi(t) = \frac{R}{2R} = \frac{1}{2}$$



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$$\frac{1}{\sqrt{2\xi}} \rightarrow \text{Frecuencia Angular}$$

$$\frac{1}{\sqrt{(15\times10^{-3})(220\times10^{-6})}}$$

$$F_A = 17407.765$$

Frecuencia en Hz $\rightarrow$ $F = \frac{W}{2\pi} \rightarrow 1.5708$ =

4 fotes cerrada y Abierta $F = \frac{17402.765}{2\pi} = 2.7kH$

↓ Señal Junta

↓ Señal separada