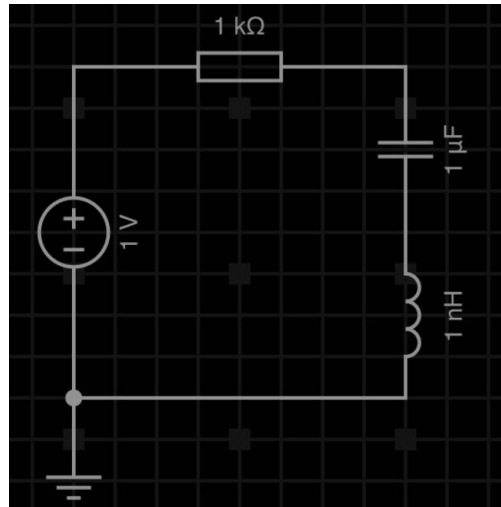


Circuito RLC:



El circuito mostrado anteriormente, tiene la siguiente función de transferencia y se debe graficar cada entrada ante un impulso, un escalón unitario y una rampa.

$$\frac{V_{out}(S)}{V_{in}(S)} = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}}$$

FORMULAS:

- IMPULSO

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * 1$$

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}}$$

- RAMPA

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * \frac{1}{S^2}$$

$$V_{out}(S) = \frac{L}{L * S^2 + R * S + \frac{1}{C}}$$

- ESCALÓN UNITARIO

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * \frac{1}{S}$$

$$V_{out}(S) = \frac{L * S}{L * S^2 + R * S + \frac{1}{C}}$$

Utilizando el programa Wolfram Alpha se obtiene las fracciones parciales y la transformada inversa de Laplace en cada uno de los casos.

- IMPULSO

Kolbi ICE 15:26 63%

partial fractions ((0.001)(s^2)) / ((0.0...

An attempt was made to fix mismatched parentheses, brackets, or braces.

Assuming "s" is a variable ...

Input interpretation

partial fractions	$\frac{0.001 s^2}{0.001 s^2 + 1000 s + \frac{1}{1 \times 10^{-6}}}$
-------------------	---

Result

$$\frac{0.001 s^2}{0.001 s^2 + 1000 s + 1000000} = -\frac{1 \times 10^6}{s + 998999} + \frac{1.00402}{s + 1001} + 1$$

Step-by-step solution

Kolbi ICE 14:56 69%

inverse laplace transform (-1000000...

An attempt was made to fix mismatched parentheses, brackets, or braces.

Assuming "s" is a variable ...

Input interpretation

$$\mathcal{L}_s^{-1} \left[-\frac{1000000}{s + 998999} + \frac{1.00402}{s + 1001} + 1 \right] (t)$$

Result

$$-1 \times 10^6 e^{-998999 t} + \delta(t) + 1.00402 e^{-1001 t}$$

- ESCALÓN UNITARIO

Kolbi ICE 14:58 69%

WolframAlpha

partial fractions ((0.001)(s))/((0.001)(s^2 + 1000 s + 1000000))

Assuming "s" is a variable ...

Input

partial fractions $(0.001 s) / (0.001 s^2 + 1000 s + 1000000)$

Result

$$\frac{0.001 s}{0.001 s^2 + 1000 s + 1000000} = \frac{1.001}{s + 998999} - \frac{0.00100301}{s + 1001}$$

Step-by-step solution

Kolbi ICE 15:04 67%

WolframAlpha

inverse laplace transform ((1.001)/(s+...))

Assuming "s" is a variable ...

Input interpretation

$$\mathcal{L}_s^{-1} \left[\frac{1.001}{s + 998999} - \frac{0.00100301}{s + 1001} \right] (t)$$

Result

$$1.001 e^{-998999 t} - 0.00100301 e^{-1001 t}$$

- RAMPA

Kolbi ICE 15:29 62%

WolframAlpha

partial fractions (0.001)/((0.001)(s^2 + 1000 s + 1000000))

Assuming "s" is a variable ...

Input

partial fractions $0.001 / (0.001 s^2 + 1000 s + 1000000)$

Result

$$\frac{0.001}{0.001 s^2 + 1000 s + 1000000} = \frac{1.00201 \times 10^{-6}}{s + 1001} - \frac{1.00201 \times 10^{-6}}{s + 998999}$$

Step-by-step solution

Kolbi ICE 15:14 65%

WolframAlpha

inverse laplace transform (1.00201*10^-6/(s+...))

Assuming "s" is a variable ...

Input interpretation

$$\mathcal{L}_s^{-1} \left[\frac{1.00201 \times 10^{-6}}{s + 1001} - \frac{1.00201 \times 10^{-6}}{s + 998999} \right] (t)$$

Result

$$1.00201 \times 10^{-6} e^{-1001 t} - 4.0201 e^{-998999 t}$$

NOTA:

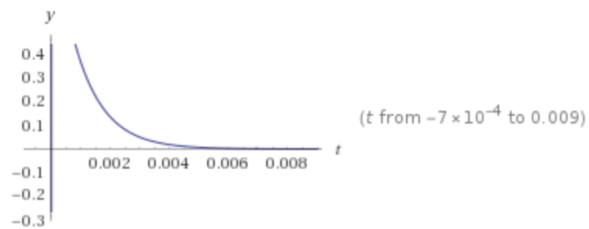
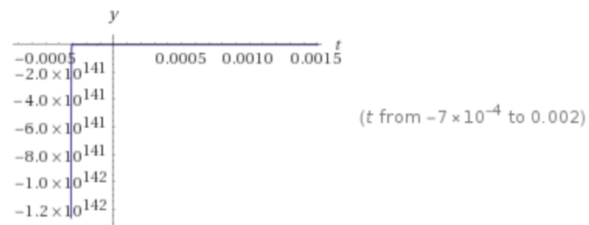
En todos los procedimientos anteriores se utilizan: L= 1mH, R= 1kΩ y C= 1μF.
(Datos brindados por el profesor en la clase)

Análisis de sistemas lineales
Martha Hernández Jara
Tarea #3

Utilizando el mismo programa se obtienen las siguientes graficas para cada caso.

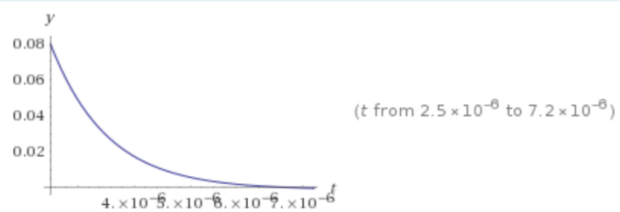
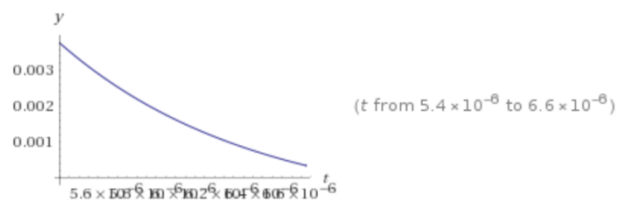
- IMPULSO

Plots:



- ESCALÓN UNITARIO

Plots:



Tarea #3

- RAMPA

Plots:

