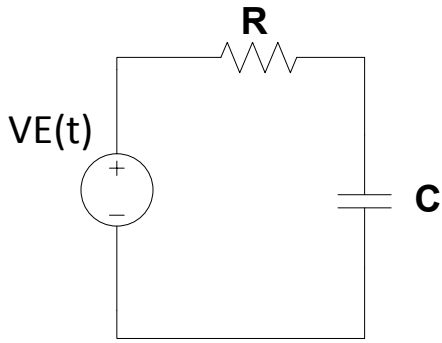


SISTEMA LINEARES INVARIANTES NO TEMPO

CIRCUITO RC Série



$$i_c(t) = C \cdot \frac{dV_c(t)}{dt}$$

Dominio do tempo

$$\frac{dV_c(t)}{dt}$$

$$V_c(t)$$

$$V_e(t)$$

Dominio do tempo

$$R \cdot i(t) + V_c(t) = V_e(t)$$

$$R \cdot C \cdot \frac{dV_c(t)}{dt} + V_c(t) = V_e(t)$$

Dominio de Laplace

$$s V_c(s)$$

$$V_c(s)$$

$$V_e(s)$$

Dominio de Laplace

$$\int^1 (R \cdot C \cdot \frac{dV_c(t)}{dt} + V_c(t) = V_e(t))$$

$$s \cdot R \cdot C \cdot V_c(s) + V_c(s) = V_e(s)$$

$$V_c(s) \cdot (sRC + 1) = V_e(s)$$

$$\frac{V_c(s)}{V_e(s)} = \frac{1}{sRC + 1}$$

$$\frac{V_c(s)}{V_e(s)} = \frac{1}{sT + 1}$$

Teorema do Valor Final:

$$\frac{V_c(s)}{V_e(s)} = F(s) = \frac{1}{sT + 1}$$

Teorema do Valor final:

$$V_c(s) = s \cdot F(s) \cdot V_e(s) \quad \lim_{s \rightarrow 0} s \cdot \frac{1}{sT + 1} \cdot V_e(s)$$

Se $V_e(s) = 15 \cdot 1$ Degrau, Então $V_e(s) = 15 \cdot 1/s$

$$V_c(s) = s \cdot F(s) \cdot V_e(s) = \cancel{s} \cdot \frac{1}{sT + 1} \cdot \frac{15}{\cancel{s}}$$

$$V_c(t \rightarrow \infty) = V_c(s \rightarrow 0) = 15$$