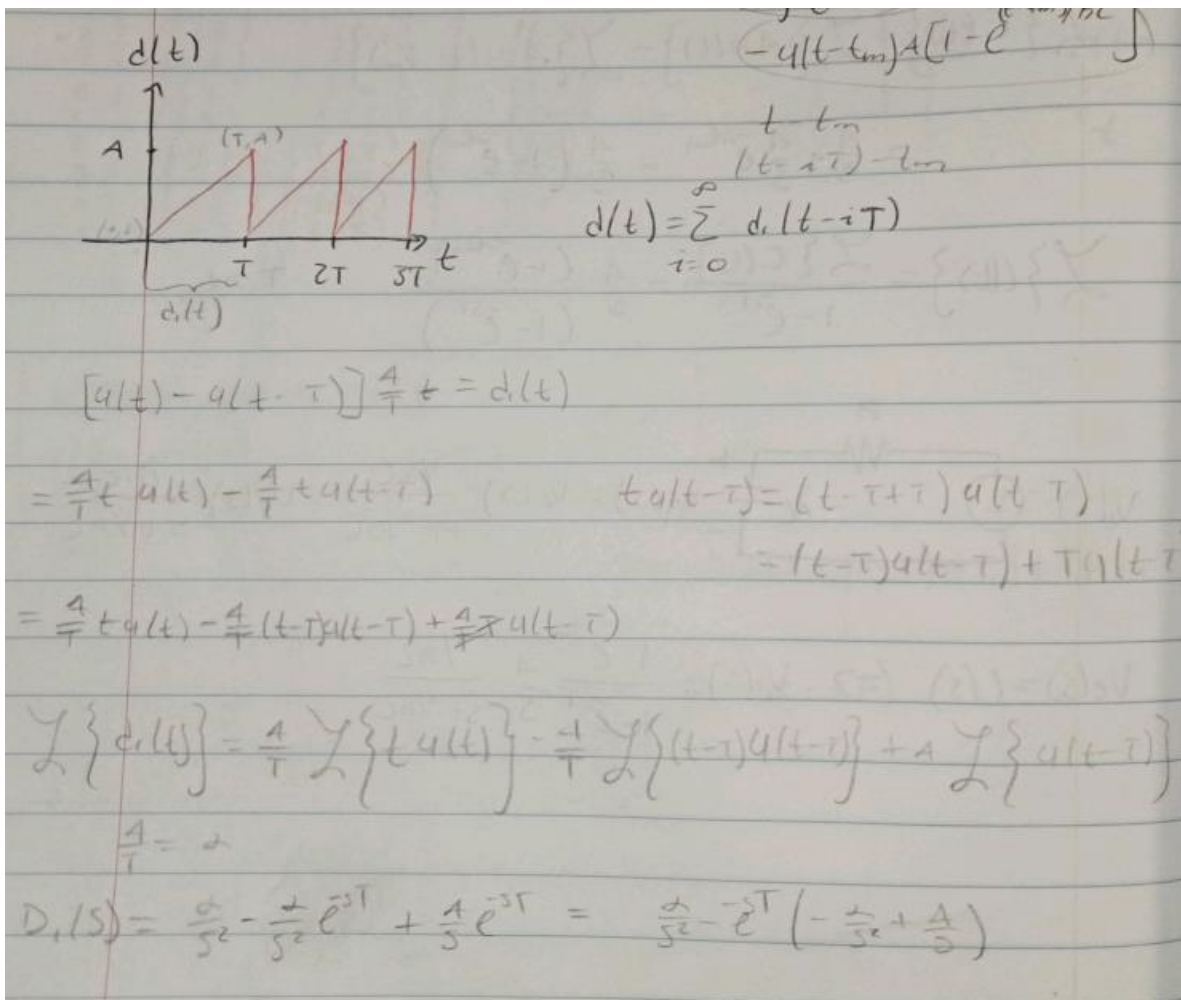


Tarea 06	Circuitos Eléctricos II	Calificación: ____
Fecha de entrega 16/01/2024	Martínez Buenrostro Jorge Rafael	N.L. 09



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$$D(s) = \frac{D_1(s)}{1 - e^{-sT}} = \frac{\frac{1}{s^2} - e^{-sT} \left(-\frac{1}{s^2} + \frac{1}{s} \right)}{1 - e^{-sT}}$$

$$V_o(s) = D(s) \frac{1/R_C}{s + 1/R_C}$$

$$D_1(s) = \frac{1/R_C}{s + 1/R_C} \left(-\frac{1}{s^2} + \frac{1}{s} \right) = \underbrace{\frac{-1/R_C}{s^2(s + 1/R_C)}}_{P_1} + \underbrace{\frac{1/R_C}{s(s + 1/R_C)}}_{P_2}$$

$$P_1 = \frac{-1/R_C}{s^2(s + 1/R_C)} = \frac{-1}{s^2} + \frac{1/R_C}{s} + \frac{-1/R_C}{(s + 1/R_C)}$$

$$s^2: \frac{-1/R_C}{1/R_C} = -1 \quad s: \frac{1}{R_C} \left(\frac{-1/R_C}{s + 1/R_C} \right) \cdot \frac{1/R_C}{(1/R_C s + 1)^2} \bigg|_{s=0} = 1/R_C$$

$$s + 1/R_C: \frac{-1/R_C}{(-1/R_C)^2} = -1/R_C$$

$$P_2 = \frac{1/R_C}{s(s + 1/R_C)} = \frac{A}{s} + \frac{-A}{s + 1/R_C}$$

$$D_1(s) = -\frac{1}{s^2} + \frac{1/R_C}{s} - \frac{1/R_C}{(s + 1/R_C)} + \frac{A}{s} - \frac{A}{(s + 1/R_C)}$$

$$V_o(s) = \left(\frac{1/R_C}{s + 1/R_C} \right) \frac{1}{s^2} - e^{-sT} \left(-\frac{1}{s^2} + \frac{1/R_C}{s} - \frac{1/R_C}{s + 1/R_C} + \frac{A}{s} - \frac{A}{s + 1/R_C} \right)$$

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$$\frac{1/P_C}{s + 1/P_C} \cdot \frac{\omega}{s^2} = \frac{\omega}{s^2} + \frac{-\omega C P_A}{s} + \frac{\omega P_C}{s + 1/P_C}$$

$$s^2: \omega \quad s: \frac{d}{ds} \left(\frac{1/P_C}{s + 1/P_C} \right) = \frac{-\omega C P_A}{(s + 1/P_C)^2} \Big|_0 = -\omega C P_A$$

$$s + 1/P_C: \frac{\omega/P_C}{(1/P_C)^2} = \frac{\omega}{P_C} = \frac{\omega C P_A^2}{P_C} = \omega P_C \quad f_r(t)$$

$$V_e(s) = \frac{\frac{\omega}{s^2} - \frac{\omega P_C}{s} + \frac{\omega P_C}{s + 1/P_C}}{1 - e^{-sT}} = \frac{-sT \left(-\frac{\omega}{s^2} + \frac{\omega P_C}{s} - \frac{\omega P_C}{s + 1/P_C} + \frac{A}{s} - \frac{A}{s + 1/P_C} \right)}{1 - e^{-sT}}$$

$$f(t) = \mathcal{L}^{-1} \left\{ \frac{\omega}{s^2} - \frac{\omega P_C}{s} + \frac{\omega P_C}{s + 1/P_C} \right\} = u(t) \left(\omega t - \omega P_C + \omega P_C e^{-(t-1)/P_C} \right)$$

$$f_r(t) = \mathcal{L}^{-1} \left\{ -e^{-sT} \frac{\omega}{s^2} \right\} + \mathcal{L}^{-1} \left\{ e^{-sT} \frac{\omega P_C}{s} \right\} - \mathcal{L}^{-1} \left\{ e^{-sT} \frac{\omega P_C}{s + 1/P_C} \right\} + \mathcal{L}^{-1} \left\{ e^{-sT} \frac{A}{s} \right\}$$

$$- \mathcal{L}^{-1} \left\{ e^{-sT} \frac{A}{s + 1/P_C} \right\}$$

$$= u(t-T) \left(\omega(t-T) + \omega P_C - \omega P_C e^{-(t-T)/P_C} + A - A e^{-(t-T)/P_C} \right)$$

$$V_e(t) = \sum_{r=0}^{\infty} V_{e,i}(t-rT) \Rightarrow V_{e,i}(t) = f(t) - f_r(t)$$