$$\Omega_\omega = \omega_0 = \frac{1}{R_3 C}$$

$$T(s) = -k \frac{1}{s^2 + s\frac{1}{R_2 C} + \frac{1}{R_3^2 C^2}} = -\frac{\omega_0}{R_1 C} \frac{1}{s^2 + s\frac{\omega_0}{q} + \omega_0^2}$$

$$\$ = \frac{s}{\Omega_\omega} = \frac{s}{\omega_0} \; ; \; T(\$) = -\frac{\omega_0}{R_1 C} \frac{1}{\underbrace{\$^2 \omega_0^2}_{s^2} + \underbrace{\$ \omega_0}_{s} \frac{\omega_0}{q} + \omega_0^2}$$

En adelante, $\$ = s$, recordando que corresponde a la frecuencia normalizada:

$$T(s) = -\frac{\omega_0}{R_1 C \omega_0^{\cancel{2}}} \frac{1}{s^2 + s\frac{1}{q} + 1}$$

$$T(s) = -\frac{R_3 \cancel{C}}{R_1 \cancel{C}} \frac{1}{s^2 + s\frac{1}{q} + 1}$$

$$\boxed{T(s) = -\frac{R_3}{R_1} \frac{1}{s^2 + s\frac{1}{q} + 1}}$$

Escaneado con CamScanner

$$\Omega_z = R_3$$

$$R_{3-n} = \frac{R_3}{\Omega_z} = 1$$

$$\omega_o = \frac{1}{R_3 C} = 1 \frac{rad}{s} \quad ; \quad R_3 = \frac{1}{C} \quad ; \quad C = \frac{1}{R_3}$$

$$C_{-n} = C \cdot \Omega_z = C \cdot R_3 = \frac{1}{\cancel{R_3}} \cdot \cancel{R_3} = 1$$

$$q = \frac{R_2}{R_3} = \frac{R_2}{\Omega_z} \quad ; \quad R_{2-n} = q$$

$$R_{1-n} = \frac{R_1}{\Omega_z} = \frac{R_1}{R_3} = \left(\frac{1}{k R_3 C^2}\right) \frac{1}{R_3} = \frac{1}{k} \omega_o^2 = \frac{1}{k}$$

$$R_{4-n} = \frac{R_4}{\Omega_z} = \frac{R_4}{R_3}$$

$$S_C^{\omega_o} = \frac{C}{\omega_o} \frac{\partial \omega}{\partial C} = \frac{C}{\frac{1}{R_3 C}} \frac{\partial\left(\frac{1}{R_3 C}\right)}{\partial C} \quad ; \quad \frac{\partial x^n}{\partial x} = n x^{n-1}$$

$$= \cancel{R_3} C^2 \frac{1}{\cancel{R_3}} \left(-C^{-2}\right) = -\cancel{C^2} \frac{1}{\cancel{C^2}} = -1$$

$$\boxed{S_C^{\omega_o} = -1}$$

$$S^{q}_{R_2} = \frac{R_2}{q}\,\frac{\partial q}{\partial R_2} = \frac{R_2}{\frac{R_2}{R_3}}\,\frac{\partial q}{\partial R_2} = R_3\,\frac{\partial\left(\frac{R_2}{R_3}\right)}{\partial R_2} =$$

$$= \cancel{R_3}\,\frac{1}{\cancel{R_3}}\,\frac{\partial R_2}{\partial R_2} = 1 \quad ; \quad \boxed{S^{q}_{R_2} = 1}$$

$$S^{q}_{R_3} = \frac{R_3}{q}\,\frac{\partial q}{\partial R_3} = \frac{R_3}{\frac{R_2}{R_3}}\,\frac{\partial q}{\partial R_3} = \frac{R_3^{\,2}}{R_2}\,\frac{\partial\left(\frac{R_2}{R_3}\right)}{\partial R_3} =$$

$$= \frac{R_3^{\,2}}{\cancel{R_2}}\,\cancel{R_2}\,\frac{\partial\left(\frac{1}{R_3}\right)}{\partial R_3} = R_3^{\,2}\left(-R_3^{\,-2}\right)$$

$$= -\cancel{R_3^{\,2}}\cdot\frac{1}{\cancel{R_3^{\,2}}} = -1 \quad ; \quad \boxed{S^{q}_{R_3} = -1}$$