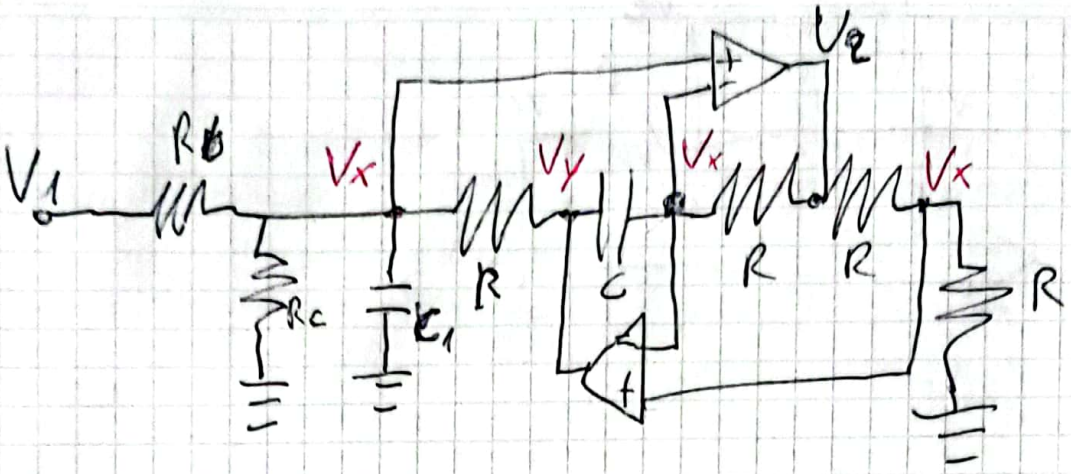

$$Y_{Rb} = \frac{a}{R}$$

$$Y_{Rc} = \frac{1-a}{R}$$

$$Y = 1$$

$$Y_c = 5$$

~~$V_x = V_1 \cdot R_c$~~

$$V_x (Y_{Rb} + Y_{Rc} + Y_c + Y) - V_1 Y_{Rb} - V_y Y = 0 \quad (1)$$

$$V_x (2Y + Y_c) - V_y Y_c - V_2 Y = 0 \quad (2)$$

$$V_x (2Y) - V_2 Y = 0 \quad (3)$$

de (3)

$$V_x = \frac{V_2}{2}$$

en (2)

$$\frac{V_2}{2} Y + \frac{V_2}{2} Y_c - V_y Y_c - V_2 Y = 0$$

$$V_y Y_c = \frac{V_2}{2} Y_c - \frac{V_2}{2} Y$$

$$V_y = \frac{V_2}{2} \left(\frac{Y_c - Y}{Y_c} \right) = \frac{V_2}{2} - \frac{V_2}{2} \frac{Y}{Y_c}$$

en (3)

$$\frac{V_2}{2} Y_{Rb} + \frac{V_2}{2} Y_{Rc} + \frac{V_2}{2} Y_c + \cancel{\frac{V_2}{2} Y} - V_1 Y_{Rb} - \cancel{\frac{V_2}{2} Y} + \frac{V_2}{2} \frac{Y^2}{Y_c} = 0$$

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$$V_1 Y_{Rb} = \frac{V_2}{2}\left(Y_{Rb} + Y_{Rc} + Y_c + \frac{Y^2}{Y_c} \right)$$

$$\frac{V_2}{V_1} = \frac{2 Y_{Rb}}{Y_{Rb} + Y_{Rc} + Y_c + \frac{Y^2}{Y_c}}$$

$$\frac{V_2}{V_1} = \frac{2 Y_{Rb} Y_c}{Y_c^2 + Y_c (Y_{Rb} + Y_{Rc}) + Y^2}$$

$$\frac{V_2}{V_1} = \frac{2\frac{a}{R} S}{S^2 + S\left(\frac{a}{R} + \frac{1-a}{R}\right) + 1}$$

$$\boxed{\frac{V_2}{V_1} = 2a \frac{\frac{2\omega_0}{R} S}{S^2 + S \frac{1}{R} + 1}}$$

Normalizado $\omega_0 = 1$

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Denormalización

$$\frac{V_2}{V_1} = 2a \frac{\frac{1}{R}\frac{s}{\omega_0}}{\frac{s^2}{\omega_0^2} + \frac{s}{\omega_0}\frac{1}{R} + 1}$$

$$\frac{V_2}{V_1} = 2a \frac{\frac{1}{R}\frac{s}{\omega_0}}{\frac{1}{\omega_0^2}\left(s^2 + s\frac{\omega_0}{R} + \omega_0^2\right)}$$

$$\boxed{\frac{V_2}{V_1} = 2a \frac{\frac{\omega_0}{R}s}{s^2 + s\frac{\omega_0}{R} + \omega_0^2}}$$

Bloque 1

$\omega_0 = 1$

$\frac{\omega_0}{R} = 0{,}125 \Rightarrow \boxed{R = 8\,\Omega}$

$2a = 1 \Rightarrow a = \frac{1}{2}$ → $\boxed{R_b = 16\,\Omega}$, $\boxed{R_c = 16\,\Omega}$

Bloque 2

$\omega_0 = \sqrt{0{,}8153} = 0{,}9$ Fcs

$\frac{\omega_0}{R} = 0{,}056 \Rightarrow \boxed{R = 16{,}07\,\Omega}$

$R_c = 1{,}11 \cdot R = 1{,}11 \cdot 16{,}07 = 17{,}83\,\Omega$ → $R_c = 18\,\Omega$?

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$2\alpha = 1 \Rightarrow \alpha = \frac{1}{2}$ → $R_b = 32,14\ \Omega$; $R_c = 32,14\ \Omega$

Bloque 3

$W_0 = \sqrt{1,2264} = 1,107$ Fcs

$\frac{W_0}{R} = 0,069 \Rightarrow R = 16,043\ \Omega$

$2\alpha = 1 \Rightarrow \alpha = \frac{1}{2} \Rightarrow$ → $R_b = 32,086\ \Omega$; $R_c = 32,086\ \Omega$

Desnormalización en frecuencia

Bloque 1: $C = \frac{1}{2\pi 22K\text{Hz}} = 7,2343\ \mu$

Bloque 2: $C = \frac{1}{2\pi \cdot 19,9K\text{Hz}} = 7,9938\ \mu$

Bloque 3: $C = \frac{1}{2\pi 2,43K\text{Hz}} = 6,597\ \mu$

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