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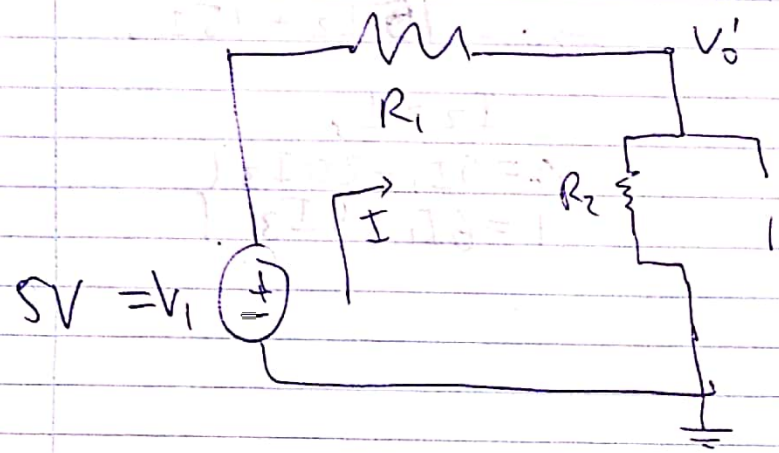
(3) Anulando la fuente alterna: (el condensador se comporta como un interruptor abierto)



$V_0 = I R_2$

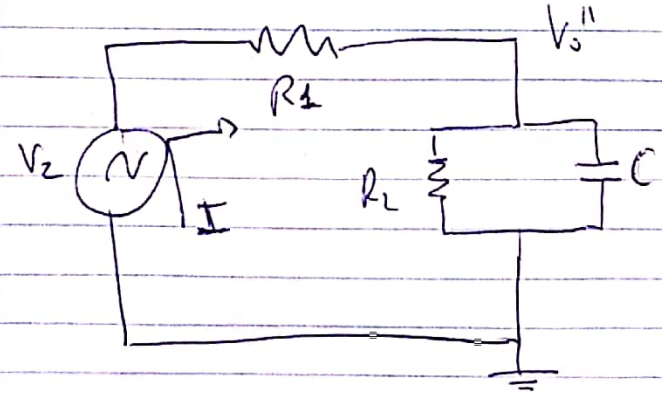
$I = \frac{V_1}{R_1 + R_2}$

$\Rightarrow V_0 = \frac{V_1}{R_1 + R_2} R_2$

$\rightarrow V_0' = \frac{5V}{7K\Omega} 5K\Omega = \frac{25}{7} V = 3,57 V = V_0'$

Anulando la fuente continua.

$V_2 = 5 \cos(2\pi 10^3 t) V$. $\omega = 2\pi \cdot 10^3 \frac{rad}{s}$. $V = 5V$, $V_2 = Re\{V e^{j\omega t}\}$



Sea $Z_{eq} = R_2 \| Z_c$

$= \left(\frac{1}{R_2} + \frac{1}{1/j\omega C}\right)^{-1}$

$= \left(\frac{1}{R_2} + j\omega C\right)^{-1}$

$= \left(\frac{1}{R_2} + j \cdot 2\pi 10^3 \cdot 2 \cdot 10^{-6}\right)^{-1}$

$= \left(\frac{1}{R_2} + j 4\pi \cdot 10^{-3}\right)^{-1}$

$Z_{eq} = \frac{1}{(1/R_2 + j 4\pi 10^{-3})} = \frac{\left(\frac{1}{R_2}\right) - (4\pi \cdot 10^{-3}) j}{\left(\frac{1}{R_2}\right)^2 + (4\pi \cdot 10^{-3})^2} = \rightarrow \left(\frac{1}{R_2} - j 4\pi \cdot 10^{-3}\right) 6330,97$

Fasor intensidad $I = \frac{V}{R_1 + Z_{eq}} = \frac{5}{2001,27 - j \cdot 79,56}$

$= \frac{5}{\sqrt{2001,27^2 + 79,56^2}} \cdot e^{-j \arctan\left(\frac{-79,56}{2001,27}\right)} =$

$= 2,50 \cdot 10^{-3} \; e^{j \cdot (2,276°)}$

$Z_{eq} = 6330,97 \sqrt{\left(\frac{1}{R_2^2} + (4\pi \cdot 10^{-3})^2\right)} \; e^{j \arctan(-4\pi \cdot 10^{-3} R_2)} = 79,57 \; e^{-j 89,08°} \; \Omega$

$$\Rightarrow V_o'' = Z_{eq} \cdot I = 0{,}194 \cdot e^{-j(89{,}08^\circ + 2{,}276)}$$

$$= 0{,}199V \cdot e^{-j(86{,}8^\circ)}$$

$$\Rightarrow V_o'' = 0{,}199V \cos(2\pi \cdot 10^3 t - 86{,}8^\circ)$$

$$V_o = V_o' + V_o'' = 3{,}57V + 0{,}199V \cos(2\pi 10^3 t - 86{,}8^\circ)$$