Universidad Nacional de San Martín
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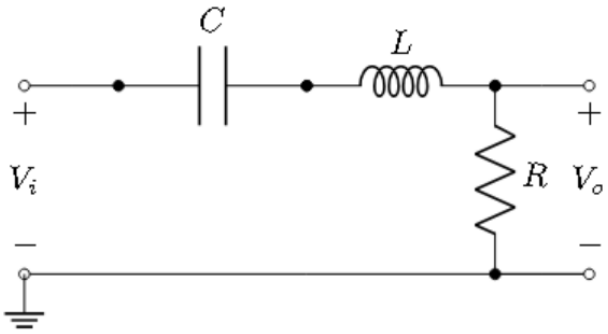
TS02-APS

1. Hallar analíticamente la función de transferencia $H(s) = \frac{V_0}{V_i}$

a. $H(s) = \frac{V_0}{V_i}$



$V_o = R$

$V_i = \frac{1}{sC} + sL + R$

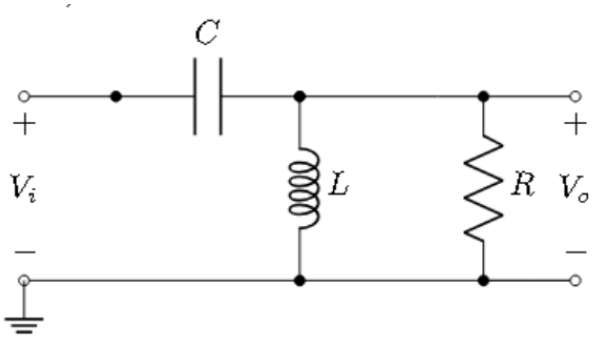
$H(s) = \frac{R}{\frac{1}{sC}+sL+R}$

$H(s) = \frac{sRC}{1+s^2LC+sCR}$

$H(s) = \frac{s\left(\frac{R}{L}\right)}{s^2+s\left(\frac{R}{L}\right)+\frac{1}{LC}}$, donde $w_0 = \sqrt{\frac{1}{LC}}$ y $\frac{w_0}{Q} = \frac{R}{L}$

$$\boldsymbol{H(s) = \frac{s\frac{w_0}{Q}}{s^2+s\frac{w0}{Q}+w_0{}^2}}$$ **Función Transferencia**

b.



$H(s) = \frac{V_0}{V_i}$

$V_o = \frac{sRL}{sL+R}$

$V_i = \frac{1}{sC} + \frac{sRL}{sL+R} = \frac{sL+R+s^2LRC}{sC(sL+R)}$

$H(s) = \frac{\frac{sRL}{sL+R}}{\frac{sL+R+s^2LRC}{sC(sL+R)}}$

$H(s) = \frac{s^2}{s^2+\frac{s}{RC}+\frac{1}{LC}}$, donde $w_0 = \sqrt{\frac{1}{LC}}$ y $\frac{w_0}{Q} = \frac{1}{RC}$

$$\boldsymbol{H(s) = \frac{s^2}{s^2+s\frac{w_0}{Q}+w_0{}^2}}$$ **Función Transferencia**