

Suppose the input Voltage to a lowpass RC filter is $V_i(t) = e^{-5t} u(t)$ V

a.) What is the Fourier Transform $V_i(\omega)$ for $V_i(t)$?

$$V_i(\omega) = \frac{1}{(-s + j\omega)}$$

b.) What is the Fourier Transform $V_o(\omega)$ for $V_o(t)$?

$$V_o(\omega) = \frac{1}{(10 + j\omega)}$$

c.) How Much of $V_i(t)$'s 1Ω energy is within the frequency range of $0 \leq \omega \leq 5$ rad/s?