

task_uzbbnoz8abe6201d_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

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exam ee1 SS2023

Exercise E9 Impedances at Frequencies
(written test, approx. 14 % of a 60-minute written test, SS2023)

At an inductor with $X_{L1} = 60 \text{ m}\Omega$ and a capacitor with $X_{C2} = 15.9 \text{ }\mu\Omega$ are connected in series. The voltage U is measured across the series combination with $I = 5.6 \text{ A}$.
1. An inductor with $X_{L1} = 60 \text{ m}\Omega$ and $L_1 = 15.9 \text{ }\mu\text{H}$.

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Solution
Solution
\begin{align*} f_0 = 3000 \text{ Hz} \end{align*}

\begin{align*} X_{C2} &= \frac{1}{\omega C_2} = \frac{1}{2\pi \cdot 3000 \cdot 10^{-6}} = 26.5 \text{ }\mu\Omega \\ X_{L1} &= \omega L_1 = 2\pi \cdot 3000 \cdot 15.9 \cdot 10^{-6} = 0.3 \text{ m}\Omega \end{align*}

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