

task_kricv9fh7haauo6q_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

Exercise E1.1 Complex Impedance Circuit (written test, approx. 15 % of a 60-minute written test, WS2022) 2

complex impedance, exam ee1 WS2022

Exercise E1.1 Complex Impedance Circuit

(written test, approx. 15 % of a 60-minute written test, WS2022)

[illegible]

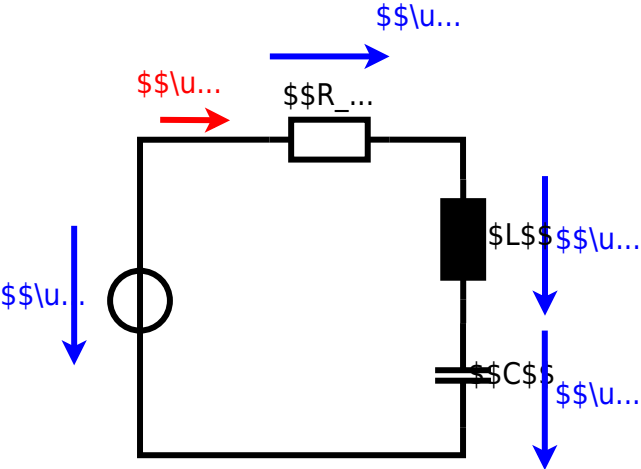
Solution
This linear source is connected with an inductor of $330 \sim \{\rm \mu H\}$ and a capacitor of $0.22 \sim \{\rm \mu F\}$, all in series.

Result

.. Draw the circuit diagram of the given circuit.

`\end{align*}`
label all components, voltages, and currents.

$$\begin{aligned} Z_C &= \frac{\hat{U}}{\hat{I}} \quad \hat{I} = \frac{\hat{U}}{Z} \\ Z_C &= \frac{1}{2\pi \cdot f \cdot C} \quad = \frac{1}{2\pi \cdot 15 \text{ kHz} \cdot 0.22 \cdot 10^{-6} \text{ F}} \end{aligned}$$
$$\begin{aligned} \text{\texttt{\textbackslash begin\{align\}}} & \text{\texttt{\textbackslash overline\{Z\}}}\omega_c = \sqrt{R^2 + (\text{\texttt{\textbackslash underline\{Z_L\}}}-\text{\texttt{\textbackslash underline\{Z_C\}}})^2} \\ & \text{\texttt{\textbackslash end\{align\}}} \\ \text{\texttt{\textbackslash begin\{align\}}} & \text{\texttt{\textbackslash overline\{Z\}}}\omega_c = R + j \\ & \text{\texttt{\textbackslash cdot\{Z_L\}}}-j\text{\texttt{\textbackslash cdot\{Z_C\}}}\text{\texttt{\textbackslash \&}=} R + j\text{\texttt{\textbackslash cdot\{Z_L\}}}-\text{\texttt{\textbackslash cdot\{Z_C\}}}\text{\texttt{\textbackslash \&}= } \\ & \text{\texttt{\textbackslash sqrt\{R^2+\text{\texttt{\textbackslash underline\{Z_L\}}-\text{\texttt{\textbackslash underline\{Z_C\}}}\wedge2\}}}\text{\texttt{\textbackslash end\{align\}}} \end{aligned}$$



From:
<https://wiki.mexle.te.hs-heilbronn.de/> - MEXLE Wiki

Permanent link:
https://wiki.mexle.te.hs-heilbronn.de/electrical_engineering_1/task_kricv9fh7haauo6q_with_calculation?rev=1680242172

Last update: **2023/03/31 07:56**

