

task_kricv9fh7haauo6q_with_calculation

Student Group

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

1. Calculate the series impedance $\underline{Z}$ of the circuit shown in Fig. 1. The voltage source $u(t) = 3.0 \cdot \sin(2\pi \cdot 15 \cdot 10^3 t) \text{ V}$ is connected to a series combination of an inductor $L = 330 \text{ } \mu\text{H}$ and a capacitor $C = 0.22 \text{ } \mu\text{F}$. The current $i(t)$ is the current through the inductor.

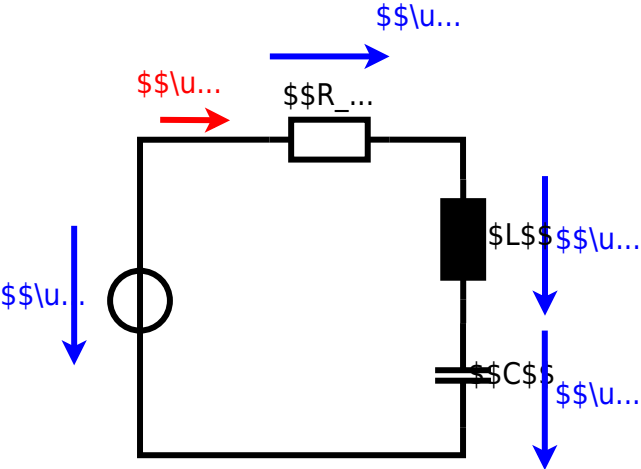
Solution: The linear source is connected with an inductor of $330 \text{ } \mu\text{H}$ and a capacitor of $0.22 \text{ } \mu\text{F}$, all in series.

Result: $\underline{Z} = 19.8 \text{ } \Omega$

Draw the circuit diagram of the given circuit.

Label all components, voltages, and currents.

Result: $\underline{Z} = 19.8 \text{ } \Omega$



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