

task_ezrkjzifcegttcpc_with_calculation

Student Group

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resonance, resonant circuit, RMS, power, exam ee2 SS2021

Exercise E1 Resonant Circuit

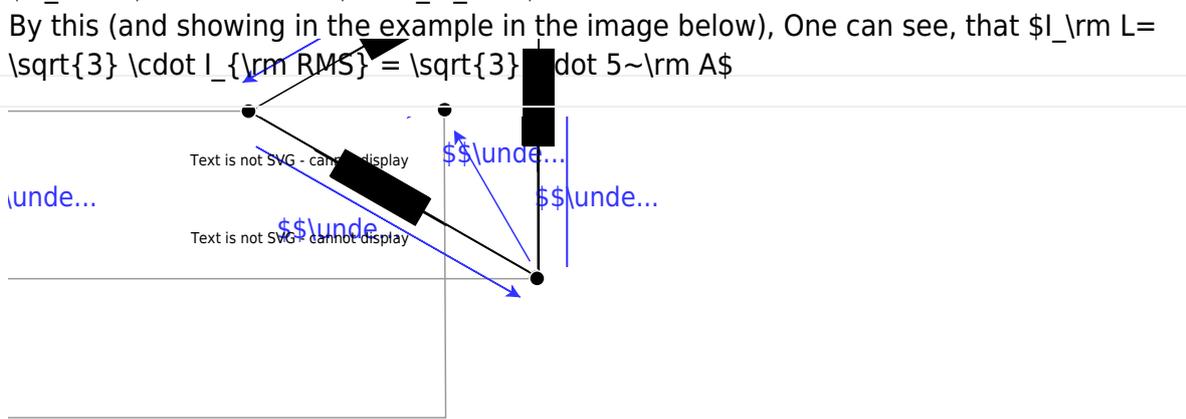
(written test, approx. 4 % of a 120-minute written test, SS2021)

Specify the RMS value of the phase voltage U_{ph} and the resulting voltage U_{rms} .
Results be considered in the following.

A voltage with the RMS value $U_{\text{RMS}} = 110 \text{ V}$ is applied between the terminals
Path

Through each of the windings, there is a current with an RMS value $I_{\text{RMS}} = 5 \text{ A}$
and a phase shift $\varphi = \pm 25^\circ$ compared to the voltage.

Since $P_{\text{res}} = 0$ and $Q_{\text{res}} = 0$, the real power P_{res} and reactive power Q_{res} must be zero.
By this (and showing in the example in the image below), One can see, that $I_{\text{L}} = \sqrt{3} \cdot I_{\text{RMS}} = \sqrt{3} \cdot 5 \text{ A}$



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