task_ezrkjzifcegttcpc_with_calculation

Student Group

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resonance, resonant circuit, RMS, exam ee2 SS2021

Exercise E1 Resonant Circuit
(written test, approx. 4 % of a 120-minute written test, SS2021)

shall be considered in the following.

A voltage with the RMS value $U_{\rm RMS} = 110~\rm V$ is applied between the terminals of each winding.

Through each of the windings, there is a current with an RMS value $I_{\rm RMS} = 5 ~\rm A$ and a phase shift of $\varphi = +25°$ compared to the voltage.

- $U_{\rm S} = 110~\rm V$

For delta configuration, the phase voltage $U_\rm L$ is equal to the string voltage $U_\rm S$.

With the values: \begin{align*} f_0 &= {{1}\over{ 2\pi \sqrt{20 \cdot 10^{-3} ~\rm H \cdot 30 \cdot 10^{-6} ~\rm F} }} \\ &= 205.4681... \rm Hz \end{align*}