

task_uzbbnoz8abe6201d_with_calculation

Student Group

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Exercise E1 Impedances at Frequencies**(written test, approx. 14 % of a 60-minute written test, SS2023)**

At an induction with $f_0 = 50 \text{ Hz}$ following impedances are given as in table 1. The value of the results are assumed with $I_0 = 5.6 \text{ A}$.

1. An inductor with $X_{L1} = 60 \text{ m}\Omega$ and $L_1 = 15.9 \text{ }\mu\text{H}$.

Solution

Solution

$$\begin{aligned} f_0 &= 50 \text{ Hz} \\ \omega &= 2\pi f_0 = 314.16 \text{ rad/s} \end{aligned}$$

$$\begin{aligned} X_{L1} &= \omega L_1 \\ L_1 &= \frac{X_{L1}}{\omega} = \frac{60 \text{ m}\Omega}{314.16 \text{ rad/s}} = 15.9 \text{ }\mu\text{H} \end{aligned}$$

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