task_uzbbnoz8abe6201d_with_calculation

Student Group

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exam ee1 SS2023

Exercise E8 Impedances at Frequencies
(written test, approx. 14 % of a 60-minute written test, SS2023)

[illegible] An inductor with $L_2 = 502 ~\rm mH$ [illegible] the [illegible] $= 6.8 ~\rm V$ [illegible] the
Result [illegible] impedance as a capacitor with $C_3 = 5.6 ~\rm nF$.
1. An inductor with $X_{L1} = 60 ~\rm m\Omega$ and $L_1 = 15.9 ~\rm \mu H$.

Solution
Solution

\begin{align*} f_[illegible] = [illegible] ~{\rm Hz} \rightarrow f_[illegible] = [illegible] ~{\rm kHz} \end{align*}
kHz}\end{align*}

\begin{align*} X_{C3} &= {{1}\over{\omega_3 \cdot C_3}} [illegible] \rightarrow f_3 [illegible]

\begin{align*} X_{L1} &= \omega_1 \cdot L = 2\pi f_1 \cdot L_1 \\ \rightarrow f_1 &= {{X_{L1}} \over {2\pi \cdot L_1}} \\ &= {{60 ~\rm m\Omega} \over {2\pi \cdot 15.9 ~\rm \mu H}} \\ &= {{60 \cdot 10^{-3}} \over {2\pi \cdot 15.9 \cdot 10^{-6}}} \rm {{{V}\over{A}} } \over {{Vs}\over{A}}}} \\ \end{align*}

[illegible] \cdot A/Vs}} } \\ \end{align*}

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