

task_c9fj1si7l797equs_with_calculation

Student Group

| First Name | Surname | Matrikel Nr. |
|------------|---------|--------------|
| | | |
| | | |
| | | |

Table of Contents

| | |
|---|---|
| Exercise E1 Complex voltage dividers (written test, approx. 16 % of a 60-minute written test, SS2023) | 2 |
|---|---|

impedance, phasor, cutoff, exam ee1 SS2023

Exercise E1 Complex voltage dividers
(written test, approx. 16 % of a 60-minute written test, SS2023)

Task: Calculate the two impedances Z_1 and Z_2 in the circuit below resulting in a phase shift between impedance Z_1 and Z_2 of 90° . Choose an appropriate scaling factor and write it down.

- $R = 1.1 \text{ k}\Omega$

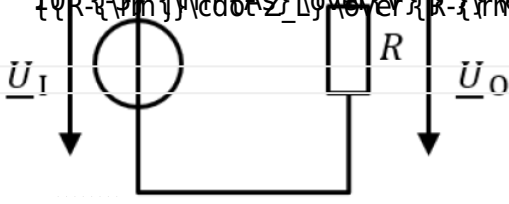
Solution: $L = 3.5 \text{ mH}$

Result:

$$\underline{U}_I = 5 \text{ V}$$

$$\underline{U}_O = 0.5 \text{ V} - j \cdot 1.5 \text{ V}$$

The cutoff frequency is the absolute value of the impedance Z_1 is equal to R . This leads to $\omega = \frac{1}{RC} = \frac{1}{1.1 \text{ k}\Omega \cdot 3.5 \text{ mH}} = 260 \text{ rad/s}$. This leads to $f = \frac{\omega}{2\pi} = 41 \text{ Hz}$.



.. Calculate the impedance Z_L .

Solution

$$\underline{Z}_L = j \cdot \omega \cdot L = j \cdot 2\pi \cdot 150 \text{ kHz} \cdot 3.5 \text{ mH}$$

From: <https://wiki.mexle.org/> - **MEXLE Wiki**

Permanent link: https://wiki.mexle.org/ee1/task_c9fj1si7l797equis_with_calculation

Last update: **2024/02/08 14:25**

