uebungsblatt6

Student Group

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Table of Contents

Übungsblatt 6

Bitte laden Sie das aufgefüllte PDF in ILIAS hoch.

Details, Tipps und Tools zum Ausfüllen und Einfügen von Bildern finden Sie unter:
Tools für Lehr/Lern-Veranstaltungen

Name	**Vorname**	**Matrikelnummer**
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Exercise 4.2.1 Determination of the transmission behavior of the differential amplifier

In the following, the transfer function of the differential amplifier is to be calculated. To do this, you should follow a few steps.

1. Derive the function $U_A = f(U_{E1}, U_{E2})$ using superposition.
    1. To do this, first draw an equivalent circuit in each case.
    2. Briefly describe the resulting circuit. Which amplification circuit results in each case?
    3. Then calculate the voltages U_A1 and U_A2, and from them U_A.
2. Determine the function $U_A = f(U_{E1}, U_{E2})$ or the resistance values of the circuit shown.

Exercise 4.4.1 Transmission resistance of the current-voltage converter

Derive the gain for the current-voltage converter, i.e. the transmission resistance. Use the procedure that we used for the other amplifiers.

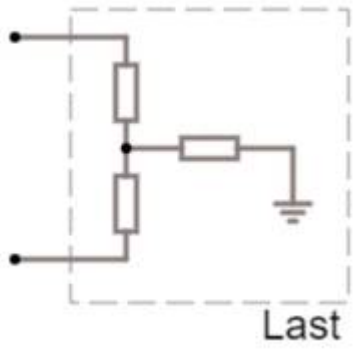
1. Draw a circuit with the relevant voltages, currents, resistances and the amplifiers
2. What are you looking for?
3. Number of variables
4. Number of equations required?
5. Establishing the known equations.
6. Derivation of the transmission resistance.

Exercise 4.5.1 Transfer steepness of the voltage-current transformer

Here, too, derive the gain for the voltage-to-current transformer, i.e. the rate of transfer. Use the same procedure that we used for the other amplifiers.

1. Draw a circuit with the relevant voltages, currents, resistances and the amplifier.
2. What are you looking for?
3. number of variables?
4. number of necessary equations?
5. Establishing the known equations.
6. Derivation of the transmission slope.

Exercise 4.5.2 Earth-related load



If the voltage-current converter is used as a current source, it must be ensured that the load has no contact with ground..

1. Draw the voltage-to-current transformer with a load that is in contact with ground.
2. In this case, why is the transmission slope derived above no longer valid as a gain factor?
3. Will the output current be higher or lower in this case?

Exercise 4.6 Meta-question

To prepare for the exam, you should also deal with the material and possible questions about it. To do this, develop **two individual questions** on the previous material, which

- either concern a partial aspect that you do not yet understand, or
- concern a partial aspect that you have learned in the last lesson.

Note that the questions should be asked in terms of difficulty so that they can also be found in the exam. Words that are too general (“Explain an operational amplifier”) should be avoided. \\I will play back the submitted questions to you via ILIAS and incorporate them into the exam.

In addition to this task, you are also welcome to write to me other content-related questions to which you would like an answer.

However, you should mark these separately.