Experiment 1: Resistors

Student Group

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Objectives of the Experiment

Getting to know the following components

- Digital multimeter
- Function generator
- Breadboard

Applying

- direct/indirect resistance measurement
- resistor standard series
- mesh/node equations
- differential resistance of an incandescent lamp

Preparation for the Lab

in the ILIAS course

Read the materials for Experiment 1 here.
These will be made public one week before the experiment.

Preparation for the Oral Short Exam

For this experiment you should

1. be able to apply and explain the following concepts:
    1. current- and voltage-correct measurement
    2. series and parallel connection of resistors
    3. mesh and node equations (Kirchhoff's laws)
    4. passive sign convention and active sign convention
    5. ideal and real sources

You should be able to answer the following questions:

1. Which operating mode does the source use? Which quantity is kept constant by the source?
2. Power supplies operate in quadrants. In which quadrant is the power supply operated? What can the source then correspondingly not do?
3. What must be considered for the (loaded and unloaded) voltage divider?
4. How do you measure a voltage with a current meter? How a current with a voltage meter?
5. How does an ohmmeter measure resistance?
6. Where are the limits of linearity in real resistors?
7. What examples are there of linear and non-linear resistors?
8. What else can the resistance depend on?