

4. BLACK BOX (12 points) — *Jaan Kalda, Eero Uustalu.*

Tools: a black box with two output terminals, a multimeter, a stopwatch, wires.

The resistance of the multimeter is as follows: when used as microammeter — $103.2\ \Omega$; when used as a milliammeter — $4.2\ \Omega$; when used as a voltmeter — more than $10\ \text{M}\Omega$. When used as a voltmeter, the multimeter will automatically determine the optimum range, but this will slow it down; to make it faster, press the “Range” button to fix it to the current range.

Which four components (apart from the wires; there can be more than one of the same type) are in the black box? What are the values of the quantities that characterise these components and how could they be connected? Document and tabulate all your measurements and plot them graphically where appropriate.