10. Black box (10 points) — *Jaan Kalda, Siim Ainsaar.* In a black box with three terminals (A, B and C) there is a resistor (resistance R_1), a capacitor (capacitance C), and a series connection of a battery (electromotive force $\mathcal{E}$) with another resistor (R_2).

i) *(3 points)* Determine the circuit diagram of the black box.

ii) *(7 points)* Measure the electromotive force of the battery, the resistances of the resistors, and the capacitance of the capacitor. Estimate the uncertainties. Always indicate the circuit diagram and the multimeter settings you used for the measurements!

Equipment: black box, multimeter, stopwatch, wires, graph paper.