

Experiment 2

Candidates will be expected to determine the internal resistance of a power supply.

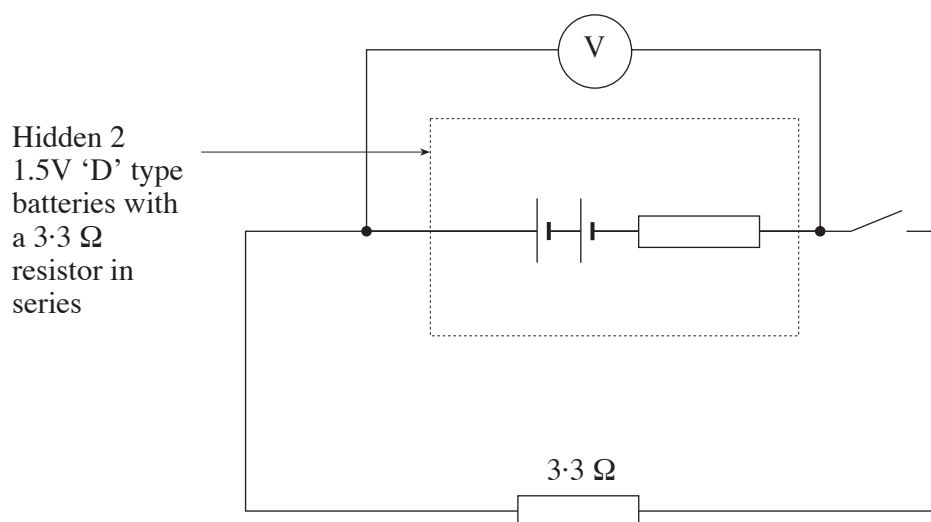
Test 1

Apparatus required:

- 2 × 'D' type 1.5 V cells arranged in series
- 2 × 'D' type battery holders
- 1 × 3.3 Ω resistor permanently attached in series to the cells. The cells and resistor should be enclosed so they are hidden from candidates and then labelled 'power supply'.
- 1 × 3.3 Ω resistor labelled '3.3 Ω'
- 1 × 4.7 Ω resistor labelled '4.7 Ω'
- 1 × 6.6 Ω resistor labelled '6.6 Ω'
- 1 × Voltmeter accurate to 0.01 V
- 1 × push to make switch – e.g. morse key switch.
- 7 × 4 mm leads to make up the circuit

Note: It is advisable to use high-power resistors for this circuit. The 3.3 Ω “internal resistor” should be capable of surviving a short circuit for a short period - a power dissipation of about 3 W. A ceramic wire-wound resistor is suggested. The other resistors should have a power rating of at least 1 W.

The following circuit is to be set up for the candidates. The candidates will be expected to draw the circuit.



The candidates will need to replace the 3.3 Ω resistor with the other individual resistors and series combinations of the resistors. It is permissible for the resistors to be mounted, e.g. on trunking, and provided with suitable connecting sockets, e.g. 4 mm.

Test 2

The apparatus is as for **Test 1**, except that the hidden resistor in the power supply should be a **4.7 Ω resistor**. It should be capable of dissipating at least 2 W for a short period.