Experiment 7: To determine the Internal Resistance of a battery

(a) What do you understand by the *internal resistance* of a cell?

(b) In the circuit of Fig. 10.1, the voltmeter may be assumed to have infinite resistance, but the resistance of the ammeter is NOT negligible. Readings V and I from the voltmeter and ammeter respectively are shown in the table for different values of R.
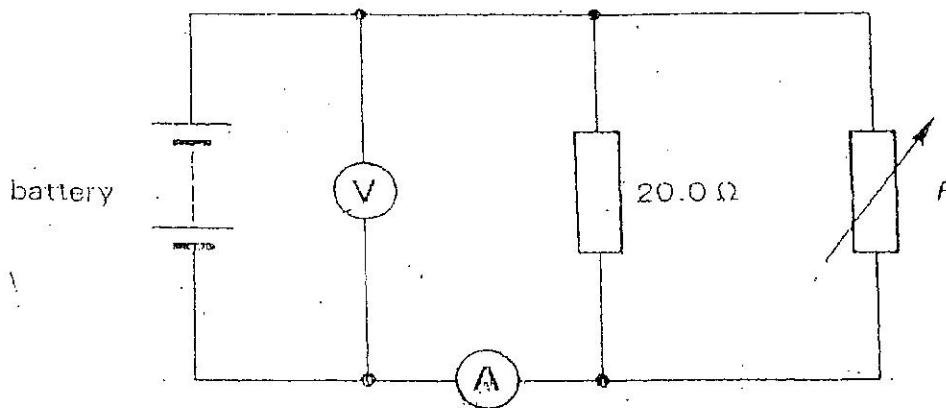

battery

20.0 Ω

R

Fig. 10.1.

R/Ω	V/V	I/A
1.00	2.86	1.40
2.00	3.59	1.23
3.00	4.12	1.11
4.00	4.54	1.03
5.00	4.80	0.95
7.00	5.29	0.84
9.00	5.62	0.77

(i) Explain why the voltmeter reading decreases as the current increases.

(ii) Plot a graph of V against I and use it to determine a value for the internal resistance of the battery.

(iii) For which value of R in the table is the power output from the battery greatest?

(iv) Use your answer to (iii) to estimate the resistance of the ammeter.