3 **(a)** An electrical component C has an I–V characteristic as shown in Fig. 3.1.

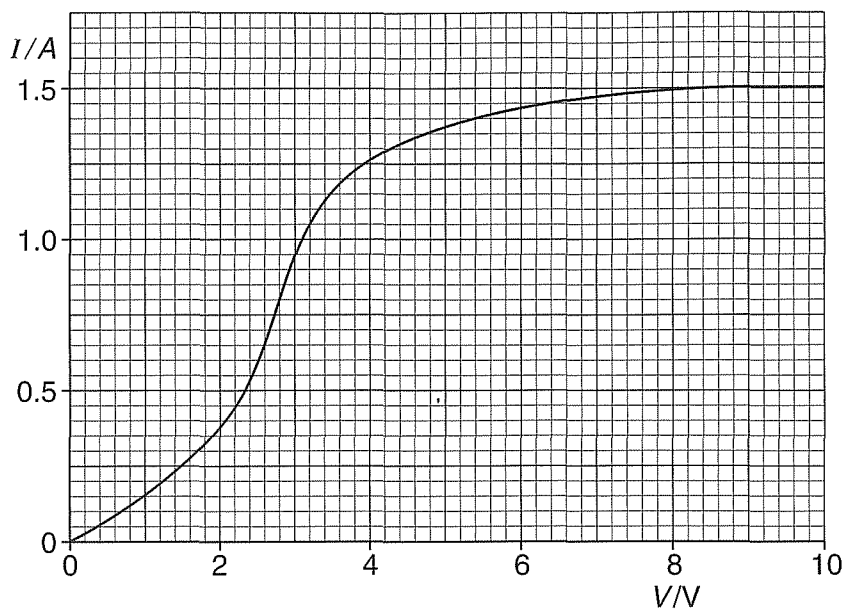**Fig. 3.1**

(i) Calculate the resistance of component C when a p.d. of 6.0 V is applied across it.

resistance = ... Ω [1]

(ii) Deduce the minimum value of the resistance of component C over the range 0 – 10 V.

resistance = ... Ω [2]

(b) Component C is then connected into a circuit with a supply of internal resistance 0.80 Ω and a resistor of constant resistance 5.0 Ω, as shown in Fig. 3.2.
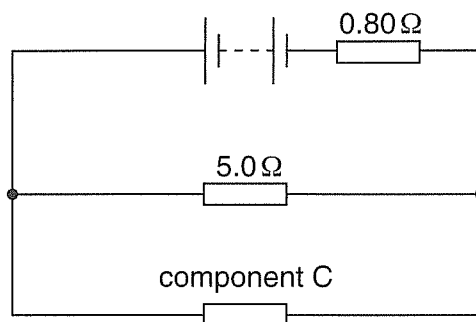

Fig. 3.2

The current through the 5.0 Ω resistor is found to be 0.85 A.

Calculate

(i) the p.d. across component C,

p.d. = ... V [2]

(ii) the total current from the supply,

current = ... A [2]

(iii) the e.m.f. of the supply,

e.m.f. = ... V [2]

(iv) the energy supplied to component C in 20 minutes.

energy = ... J [3]

9745/03/O/N/07   **[Turn over**