5 A battery of e.m.f. 4.8 V and negligible internal resistance is connected to four resistors as shown in Fig. 5.1.

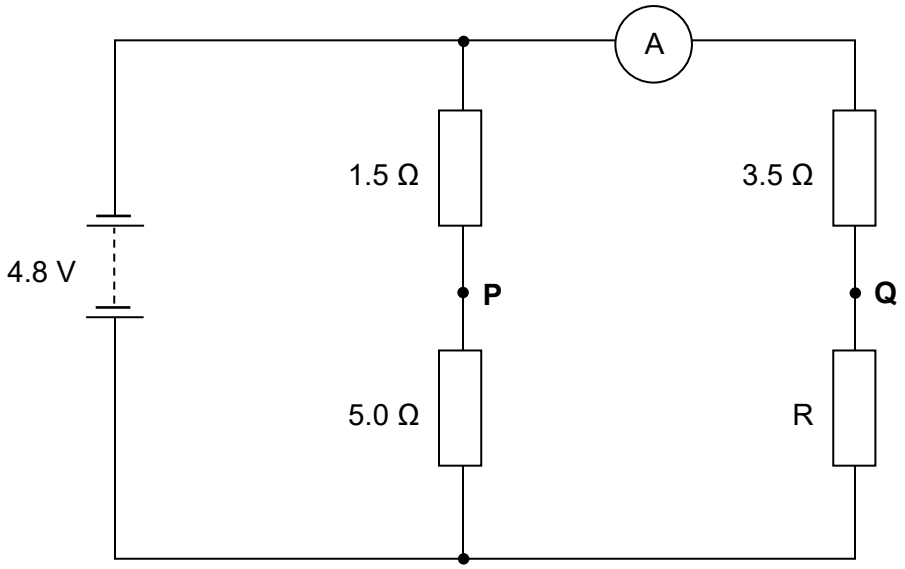

Fig. 5.1

The ammeter reading is 0.80 A.

(a) Determine the resistance of resistor R.

resistance of R = ... Ω [2]

(b) Resistor R is a metallic ohmic resistor.

(i) On Fig. 5.2, draw the I-V characteristic graph of resistor R at constant temperature. [1]

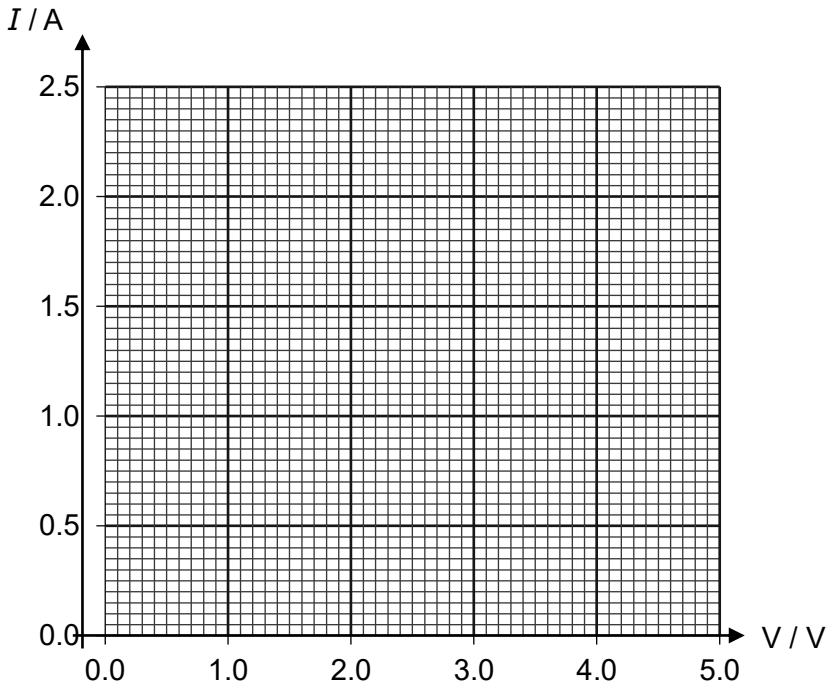

Fig. 5.2

(ii) With reference to your graph, explain the relationship between the drift velocity and the potential difference across the ohmic resistor of uniform cross-sectional area.

.....

.....

.....

.....

.....[2]

(iii) Calculate the electrical energy supplied by the battery in one hour.

electrical energy = ... J [3]

(iv) Points **P** and **Q** are points in the circuit as shown in Fig. 5.1. Determine the potential of **Q** with respect to **P**.

potential = V [2]