9   A thin slice of conducting material has its faces PQRS and VWXY normal to a uniform magnetic field of flux density B, as shown in Fig. 9.1.
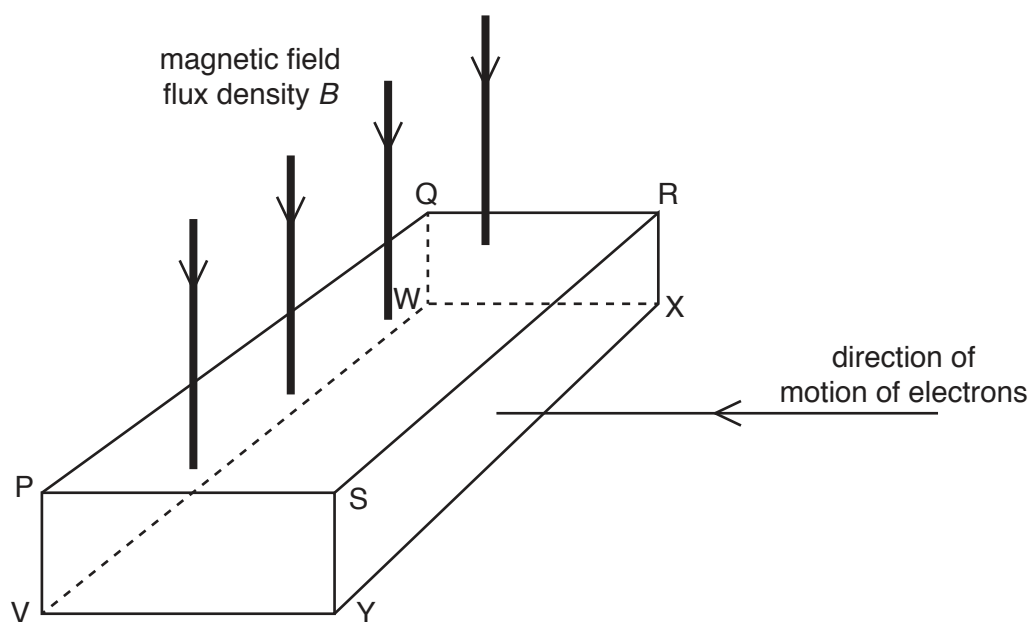

Fig. 9.1

Electrons enter the slice at right-angles to face SRXY.

A potential difference, the Hall voltage V_H, is developed between two faces of the slice.

(a) (i) Use letters from Fig. 9.1 to name the two faces between which the Hall voltage is developed.

.... and ....[1]

(ii) State and explain which of the two faces named in **(a)(i)** is the more positive.

....

....[2]

(b) The Hall voltage V_H is given by the expression

$$V_H = \frac{BI}{ntq}.$$

(i) Use the letters in Fig. 9.1 to identify the distance t.

....[1]

(ii) State the meaning of the symbol n.

....

....[1]

(iii) State and explain the effect, if any, on the polarity of the Hall voltage when negative charge carriers (electrons) are replaced with positive charge carriers, moving in the same direction towards the slice.

....

....

....[2]

[Total: 7]