

- 6 (a) (i) State the condition for a charged particle to experience a force in a magnetic field.

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[2]

- (ii) State an expression for the magnetic force  $F$  acting on a charged particle in a magnetic field of flux density  $B$ . Explain any other symbols you use.

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[2]

- (b) A sample of a conductor with rectangular faces is situated in a magnetic field, as shown in Fig. 6.1.

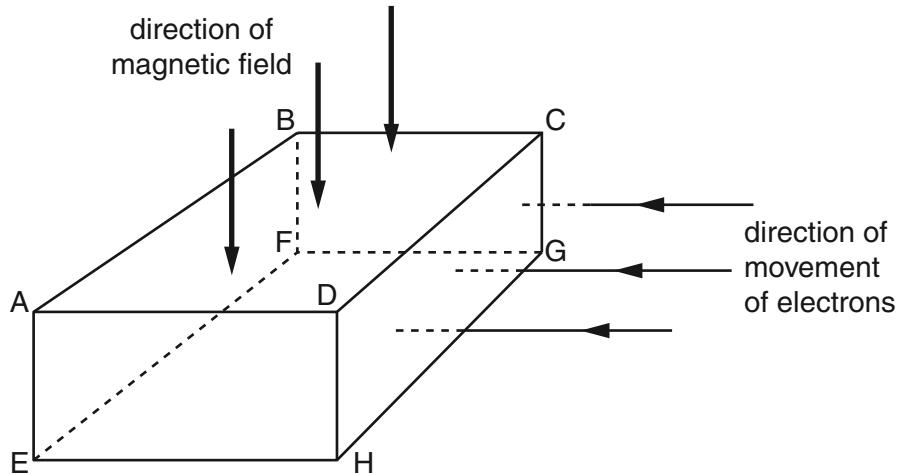


Fig. 6.1

The magnetic field is normal to face ABCD in the downward direction.

Electrons enter face CDHG at right-angles to the face. As the electrons pass through the conductor, they experience a force due to the magnetic field.

- (i) On Fig. 6.1, shade the face to which the electrons tend to move as a result of this force. [1]
- (ii) The movement of the electrons in the magnetic field causes a potential difference between two faces of the conductor.  
Using the lettering from Fig. 6.1, state the faces between which this potential difference will occur.

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

- (c) Explain why the potential difference in (b) causes an additional force on the moving electrons in the conductor.

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[2]