6 **(a)** A uniform magnetic field has constant flux density B. A straight wire of fixed length carries a current I at an angle θ to the magnetic field, as shown in Fig. 6.1.

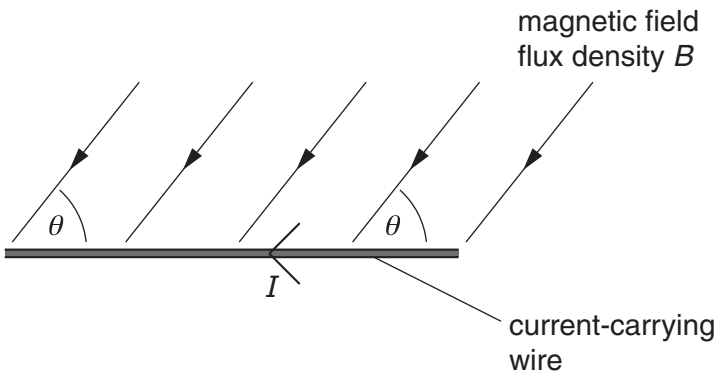

Fig. 6.1

(i) The current I in the wire is changed, keeping the angle θ constant.
On Fig. 6.2, sketch a graph to show the variation with current I of the force F on the wire.

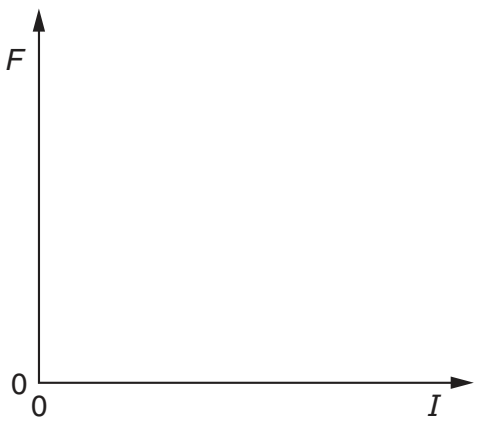

Fig. 6.2

[2]

For Examiner's Use

(ii) The angle θ between the wire and the magnetic field is now varied. The current I is kept constant.
On Fig. 6.3, sketch a graph to show the variation with angle θ of the force F on the wire.

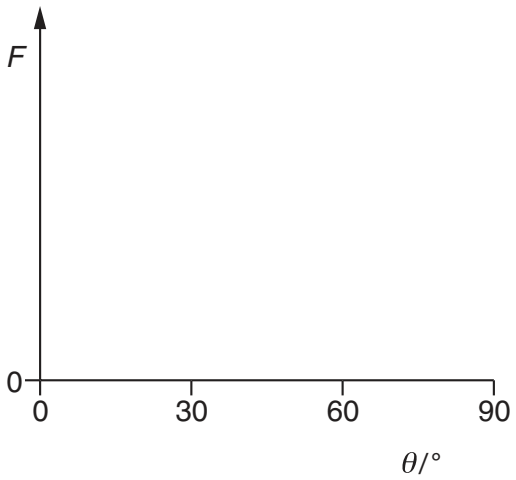

Fig. 6.3 [3]

(b) A uniform magnetic field is directed at right-angles to the rectangular surface PQRS of a slice of a conducting material, as shown in Fig. 6.4.

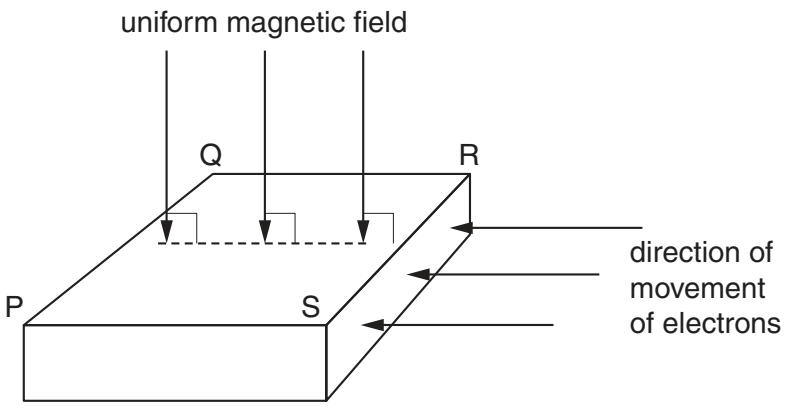

Fig. 6.4

Electrons, moving towards the side SR, enter the slice of conducting material. The electrons enter the slice at right-angles to side SR.

(i) Explain why, initially, the electrons do not travel in straight lines across the slice from side SR to side PQ.

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..... [2]

(ii) Explain to which side, PS or QR, the electrons tend to move.

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..... [2]