7 **(a)** Explain what is meant by a *field of force*.

.....

..... [1]

(b) State the type of field, or fields, that will give rise to a force acting on

(i) a moving uncharged particle,

..... [1]

(ii) a stationary charged particle,

..... [1]

(iii) a charged particle moving at an angle to the field or fields.

.....

..... [1]

(c) An electron, mass m and charge $-q$, is moving at speed v in a vacuum. It enters a region of uniform magnetic field of flux density B, as shown in Fig. 7.1.

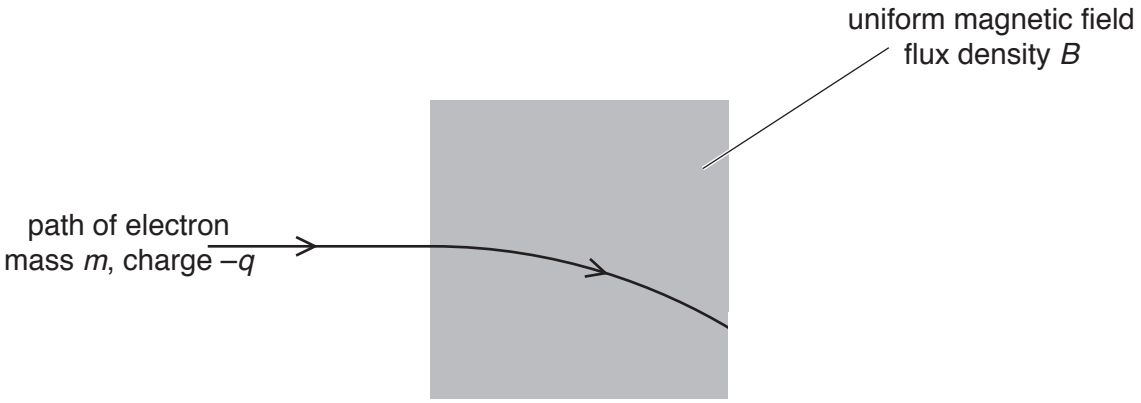

Fig. 7.1

Initially, the electron is moving at right-angles to the direction of the magnetic field.

(i) Explain why the path of the electron in the magnetic field is the arc of a circle.

.....

.....

.....

.....

..... [3]

(ii) Derive an expression, in terms of the radius r of the path, for the linear momentum of the electron. Show your working.

[2]

[Total: 9]