5(a) Define magnetic flux density. [2]

……

……

……

(b) Electrons are moving in a vacuum with speed 1.7 x 10^7 m s^{-1}. The electrons enter a uniform magnetic field of flux density 4.8 mT. The figure below shows the path of the electrons.

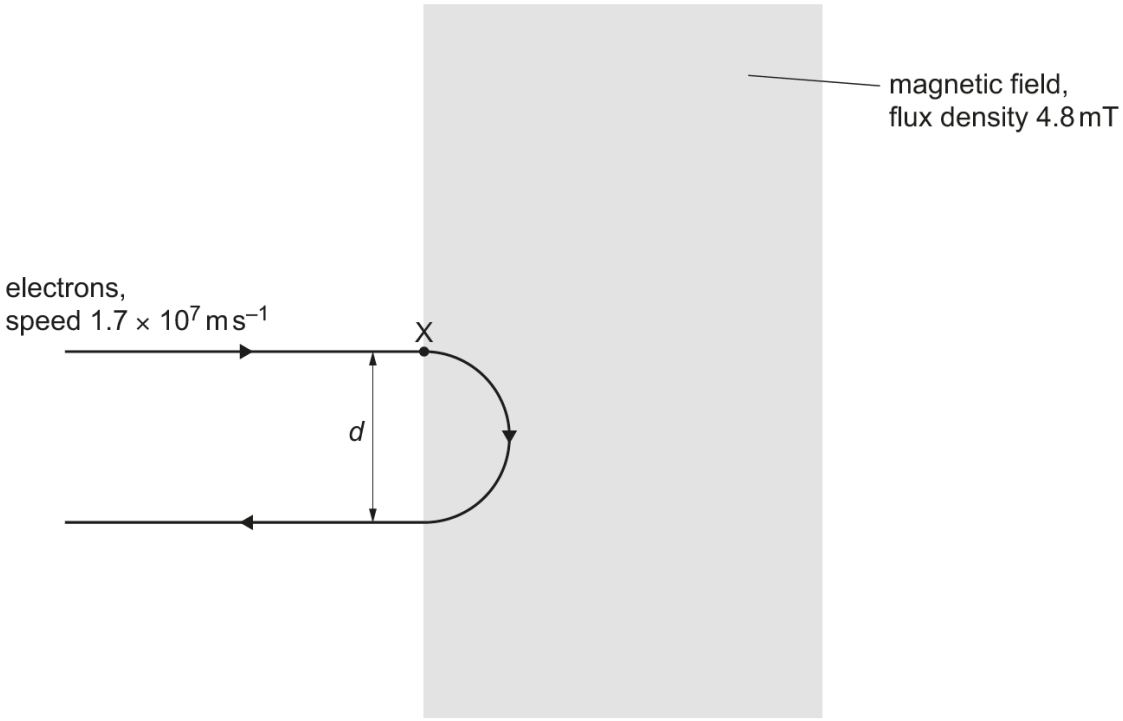

Fig 5.1

The path of the electrons remains in the plane of the page.

(i) State the direction of the magnetic flux density. [1]

……

(ii) Calculate the magnitude of the force exerted on each electron by the magnetic field. [2]

Magnitude of the force = …….

(iii) Use the information in (ii) to calculate the distance *d* between the path of the electrons entering the magnetic field and the path of the electrons leaving the magnetic field. [3]

d = …….