4 **(a)** Express the tesla in SI base units.

[2]

(b) Fig. 4.1 shows two thin wires placed in a magnetic field in a fixed orientation.

The wires are made of a non-magnetic electrical conductor.

The wires and the magnetic field are both in the plane of the page.

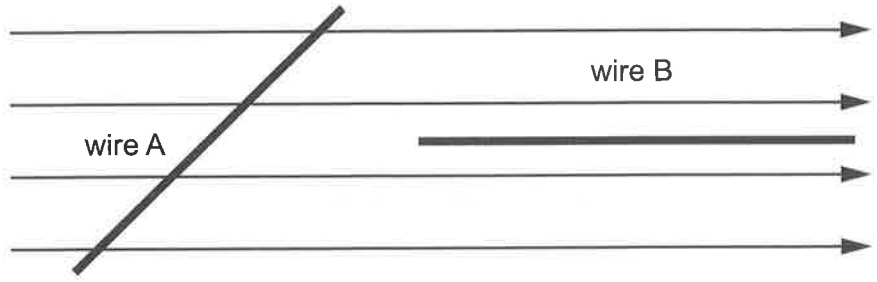

Fig 4.1

(i) State what causes wire A to experience a force due to the magnetic field.

.....

..... [1]

(ii) Explain whether it is possible for wire B to experience a force due to the magnetic field.

.....

..... [1]

(c) An electron travels through a 2.3 T magnetic field.

The velocity of the electron is $1.2 \times 10^5\,\text{m s}^{-1}$ at 75° to the magnetic field.

(i) Calculate the force on the electron due to the magnetic field.

force = ... N [2]

(ii) The force causes the electron to accelerate.

Explain whether the force does work on the electron.

.....

.....

..... [2]

[Total: 8]