Name of the Student:_____

Max. Marks : 18 Marks **Time : 18 Minutes**

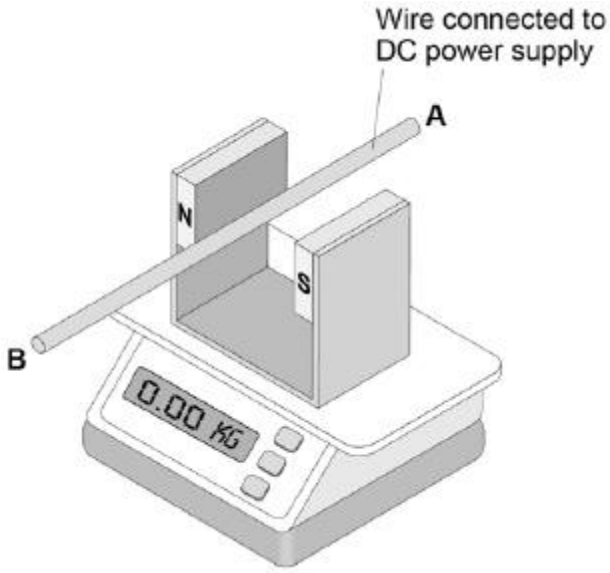
Q1.

A student placed a permanent magnet on a top-pan balance.

He clamped a straight piece of wire so that it was suspended in the magnetic field.

Figure 1 shows the apparatus.

Figure 1



(a) When a current passed through the wire from **A** to **B**, the reading on the balance increased.

Explain why.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(b) The student increased the current in the wire.

Sketch a graph on **Figure 2** to show the relationship between the current and magnetic force on the wire.

Label the axes, with the independent variable on the x-axis.

Figure 2

(2)

(c) The length of the wire in the magnetic field in **Figure 1** is 4.8×10^{-2} m

The current in the wire is 0.80 A

The reading on the balance is 1.2×10^{-3} kg

Gravitational field strength = 9.8 N/kg

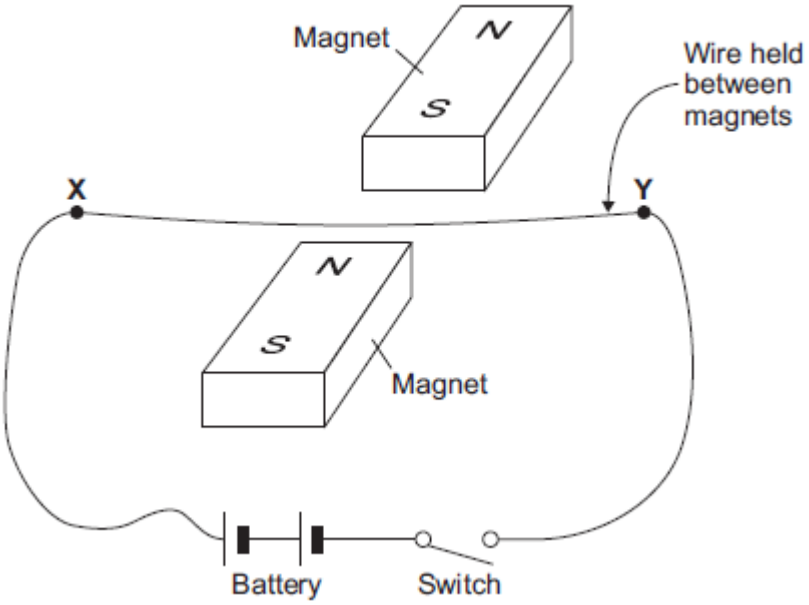
Calculate the magnetic flux density of the permanent magnet.

Magnetic flux density = _____ tesla

(5)
(Total 11 marks)

Q2.

The diagram shows apparatus set up by a student.



Closing the switch creates a force that acts on the wire **XY**.

(a) (i) Explain why a force acts on the wire **XY** when the switch is closed.

_____

_____

_____

_____

_____

_____

(3)

(ii) The force causes the wire **XY** to move.
Draw an arrow on the diagram above to show the direction in which the wire **XY** will move.

(1)

(iii) State the effect that this experiment demonstrates.

_____

(1)

(b) The student replaced the battery with a low frequency alternating current (a.c.) power supply.

The student closed the switch.

(i) Describe the movement of the wire.

_____

(1)

(ii) Give a reason for your answer to part (i).

_____

_____

_____

(1)

(Total 7 marks)