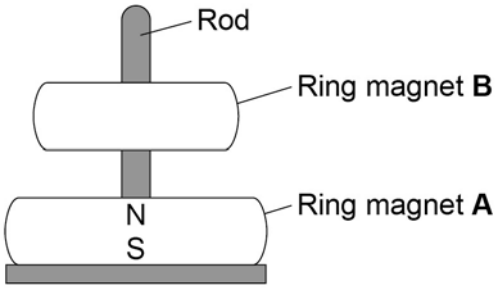
0 4 A magnetic toy uses ring-shaped magnets.

Look at **Figure 6**.

The magnets can move up and down the rod. Ring magnet **B** appears to float.

Figure 6



0 4 . 1 The magnetic poles are labelled on ring magnet **A**.

Label the magnetic poles on ring magnet **B**.

[1 mark]

0 4 . 2 What would happen if ring magnet **B** was turned upside down?

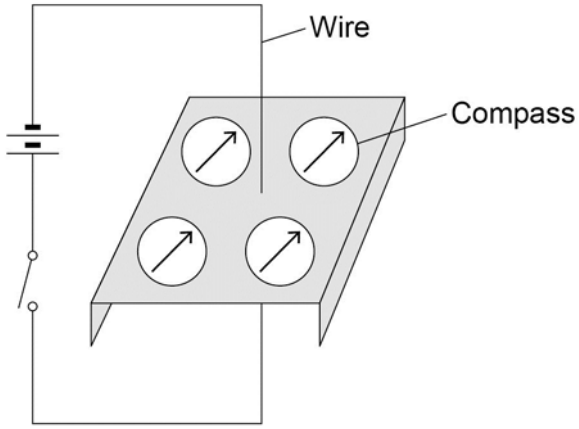
[1 mark]

Question 4 continues on the next page

Figure 7 shows four plotting compasses arranged around a wire.

The needle of a compass is a magnet.

Figure 7



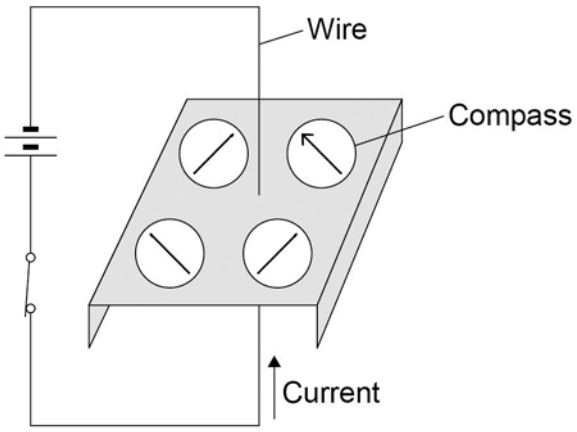
0 4 . 3 In **Figure 7** the switch is open and there is no current in the wire.

Explain why the compass needles all point in the same direction.

[2 marks]

Figure 8 shows the switch closed.

Figure 8



0 4 . 4 There is now a current in the wire.

The compass needles change direction.

On **Figure 8** draw arrowheads on the three incomplete compass needles to show their direction.

[1 mark]

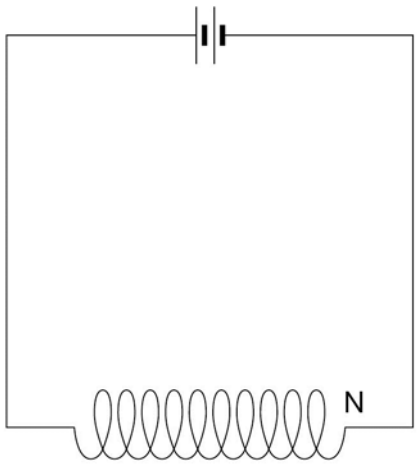
0 4 . 5 What would happen to the direction of the compass needles if the current was reversed?

[1 mark]

Question 4 continues on the next page

Figure 9 shows a coil of wire in a circuit.

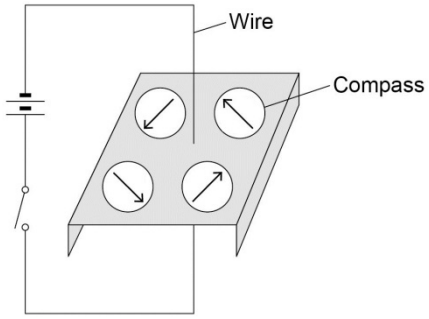
Figure 9



0 4 . 6 On **Figure 9** draw the magnetic field due to the current in the coil.

[3 marks]

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	S – top, N – bottom		1	AO1/1 6.7.1.1
04.2	touch / attracted to magnet **A**		1	AO2/1 6.7.1.1
04.3	the magnetic needles point to the north pole because The Earth has a magnetic field	 accept the needles align to the Earth's magnetic field for **2** marks	1 1	AO1/1 6.7.1.2
04.4			1	AO2/1 6.7.2.2
04.5	point in the opposite direction	change direction is insufficient	1	AO2/1 6.7.2.2
04.6	uniform field lines through the wire coil. field lines curving round the top and bottom of the wire coil. arrows indicating direction from N to S	 do **not** accept conflicting arrows	1 1 1	AO1/1 6.7.2.2
Total			**9**	