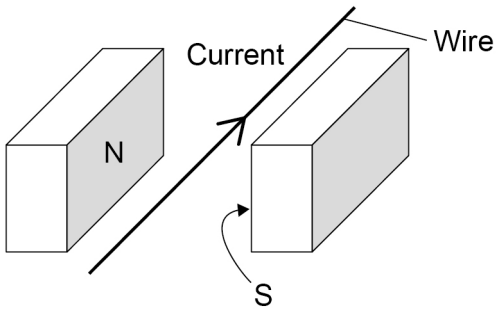
Do not write outside the box

0 4 **Figure 6** shows a wire in a magnetic field.

The direction of the current in the wire is shown.

Figure 6

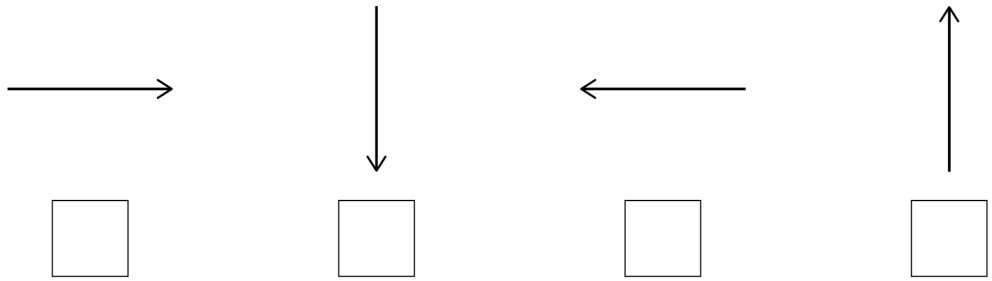


0 4 . 1 There is a force on the wire due to the current in the magnetic field.

In which direction is the force on the wire?

[1 mark]

Tick (✓) **one** box.



0 4 . 2 Give **two** ways that the direction of the force on the wire could be reversed.

[2 marks]

1 _____

2 _____

Question 4 continues on the next page

Do not write outside the box

0 4 . 3 The length of the wire in the magnetic field is 0.050 m

The force on the wire is 0.072 N

magnetic flux density = 360 mT

Calculate the current in the wire.

Use the Physics Equations Sheet.

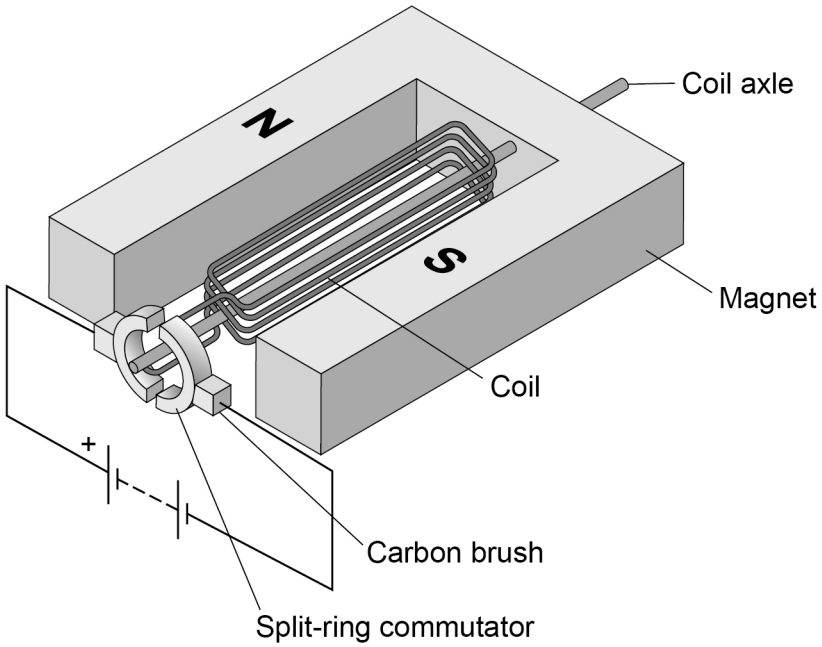
[4 marks]

Current = _____ A

Do not write outside the box

0 4 . 4 **Figure 7** shows a simple motor.

Figure 7



Explain why the coil rotates when there is a current in the coil.

[4 marks]

11

Turn over for the next question

Question	Answers	Extra information	Mark	AO / Spec. Ref.	ID
04.1			1	AO1 6.7.2.2	A
04.2	reverse the direction of the current reverse the direction of the magnetic field		1 1	AO1 6.7.2.2	E
04.3	 B = 0.360 (T) 0.072 = 0.360 × I × 0.050 $I = \frac{0.072}{(0.360 \times 0.050)}$ I = 4.0 (A)	an answer of 4.0 (A) scores **4** marks allow a correct substitution using an incorrectly / not converted value of B allow a correct rearrangement using an incorrectly / not converted value of B allow a correct calculation using an incorrectly / not converted value of B	 1 1 1 1	AO2 6.7.2.2	E

04.4	there is a magnetic field (due to the permanent magnet) **and** current in a wire causes a magnetic field current is in opposite directions in each side of the coil so forces act in opposite directions on either side of the coil (the split ring ensures that) the current in the left / right side of the coil is always in the same direction	 allow (the split ring ensures that) the force in the left / right side of the coil is always in the same direction allow the current reverses each half rotation	1 1 1 1	AO1 6.7.2.3	E
Total			**11**		