AQA Physics GCSE

P15 Electromagnetism

Exam-style questions

Name ..... Class ..... Date .....

GCSE Physics only

Foundation

0 1 **Figure 1** shows five situations A, B, C, D, and E where bars of different materials are placed next to each other.

Some of the bars are magnets and some are non-magnets.

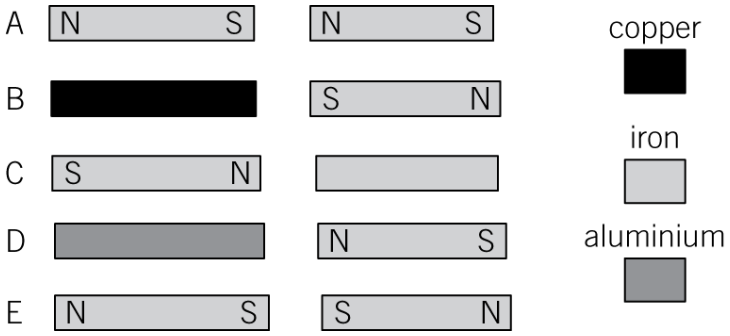

Figure 1

Some of the pairs of bars repel, some attract, and some do nothing.

0 1 . 1 Write down the letter or letters where the bars repel.

..... (*1 mark*)

0 1 . 2 Write down the letter or letters where the bars attract.

..... (*1 mark*)

0 1 . 3 Write down the letter or letters where the bars do nothing.

..... (*1 mark*)

0 1 . 4 Complete the diagram of the bar magnet to show the lines of magnetic field. (*3 marks*)

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0 2 Magnetic materials can make permanent or induced magnets.

Describe a permanent magnet.

Tick **three** boxes.

- becomes magnetised in a magnetic field ☐
- has its own magnetic field ☐
- does not lose magnetism quickly ☐
- loses magnetism quickly ☐
- made from aluminium ☐
- made from very soft iron ☐
- made from steel ☐

(*3 marks*)

0 3 A student is supplied with the equipment in **Figure 2**.

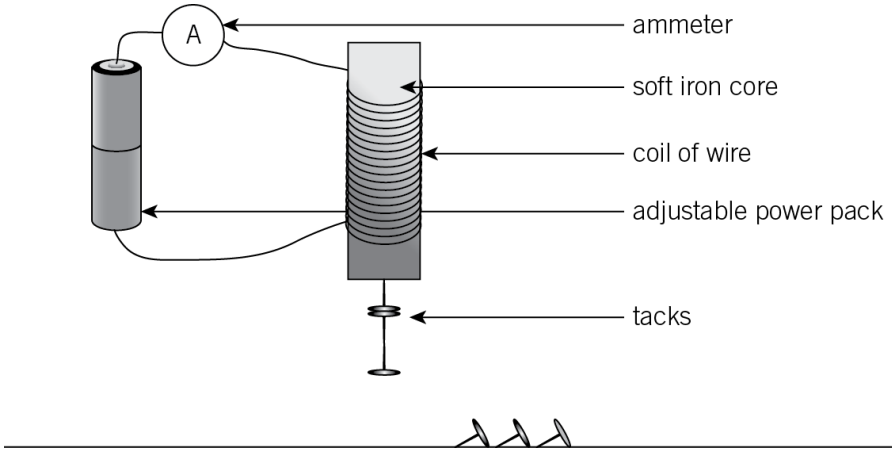

Figure 2

This is the method used.

A Set up the equipment but do not attach tacks to the iron core.

B Adjust the power pack until ammeter reads 10 mA.

C Attach tacks to the iron core one at a time.

D Record the number of tacks the iron core will hold.

E Adjust the power pack until the ammeter reads 20 mA.

F Repeat steps C and D.

G Continue with ammeter readings: 30 mA, 40 mA, and 50 mA.

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0 3 . 1 Name the dependent variable.

..... (*1 mark*)

0 3 . 2 Name the independent variable.

..... (*1 mark*)

0 3 . 3 Name **one** factor that should remain constant.

..... (*1 mark*)

0 3 . 4 The results were recorded in **Table 1**.

Table 1

Current in mA	0	10	20	30	40	50
Number of tacks	0	2	3	6	8	10

Draw a graph of the results using the *y*-axis for the number of tacks and the *x*-axis for the current. (*5 marks*)

0 3 . 5 Describe the pattern shown by the graph.

.....

..... (*2 marks*)

0 3 . 6 Give **one** possible cause of the odd result for 20 mA.

..... (*1 mark*)

0 3 . 7 Suggest **one** improvement to the investigation to improve the validity and accuracy of the results.

..... (*1 mark*)

0 3 . 8 Estimate the number of tacks attached when a current of 0.08 A passes through the coil of wire.

.....

.....

Number of tacks: ..... (*2 marks*)

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0 3 . 9 What percentage of the total number of tacks that were picked up was picked up by a current of 30 mA?

Give your answer correct to 2 significant figures.

.....

.....

.....

.....

Percentage: ..... % (*4 marks*)

0 4 Electromagnets are often used in metal recycling centres to separate steel cans from aluminium cans (**Figure 4**).

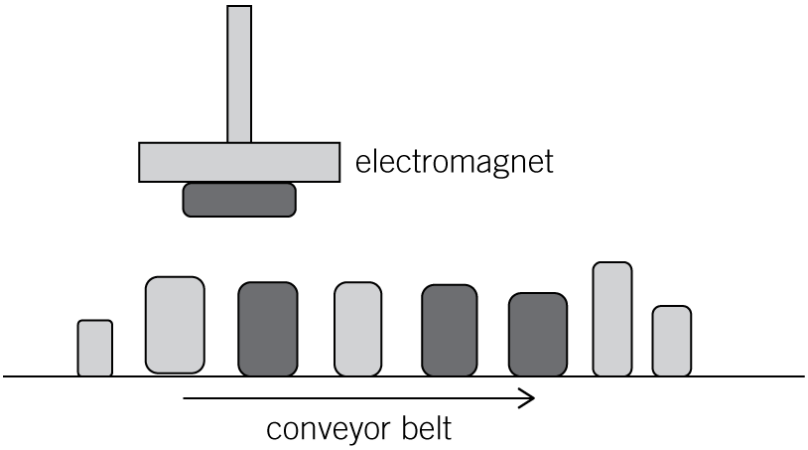

Figure 4

Describe how the electromagnet can pick up the steel cans and then drop them into a large container.

.....

.....

..... (*3 marks*)