

Name:

Date:

P7 - Test 4

MAGNETISM AND ELECTROMAGNETISM

Intermediate

GCSE

PHYSICS

AQA - Combined Science

Mark

Grade

Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

Instructions

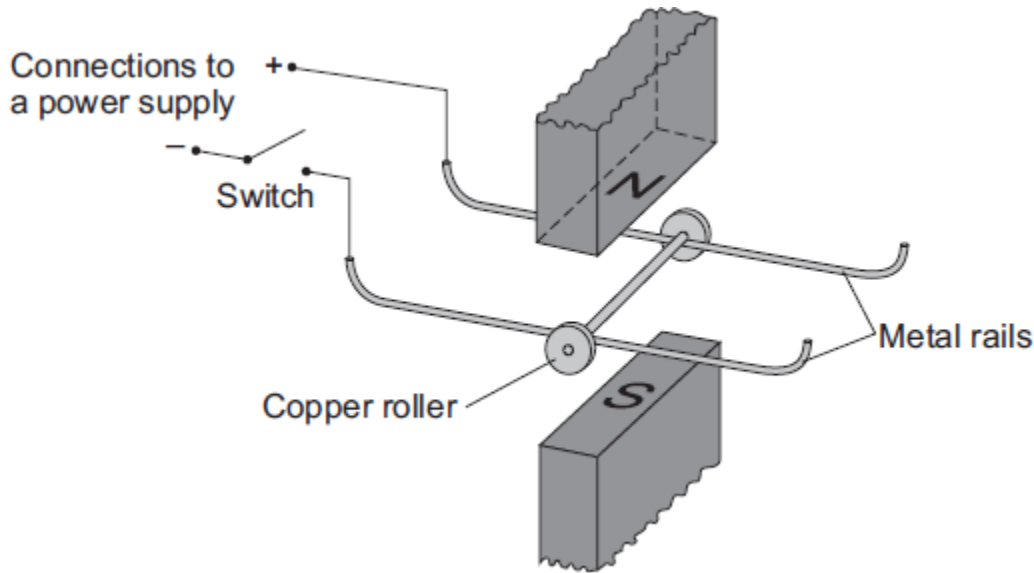
- Answer all questions
- Answer questions in the space provided
- All working must be shown

Information

- The marks for the questions are shown in brackets

1.

(a) A science technician sets up the apparatus shown below to demonstrate the motor effect. He uses a powerful permanent magnet.



The copper roller is placed across the metal rails. When the switch is closed, the copper roller moves to the right.

(i) Complete the sentence by drawing a ring around the correct line in the box.

This happens because copper is

- an electrical conductor.
- an electrical insulator.
- a magnetic material.

(1)

(ii) Suggest **one** change that the technician can make which will cause the copper roller to move faster.

(1)

(iii) Suggest **two** changes which the technician can make, each of which will separately cause the copper roller to move to the left.

1. _____

2. _____

(2)

(b) Many electrical appliances, such as vacuum cleaners, drills and CD players, contain electric motors. As more electrical appliances are developed, more electricity needs to be generated. Generating electricity often produces pollutant gases.

(i) Complete the sentence by drawing a ring around the correct line in the box.

Generating more electricity to power the increasing number of electrical

appliances used raises

an ethical
an environmental
a political

 issue.

(1)

(ii) The number of electrical appliances used in the world's richest countries is increasing yet many people in the world's poorest countries have no access to electricity.

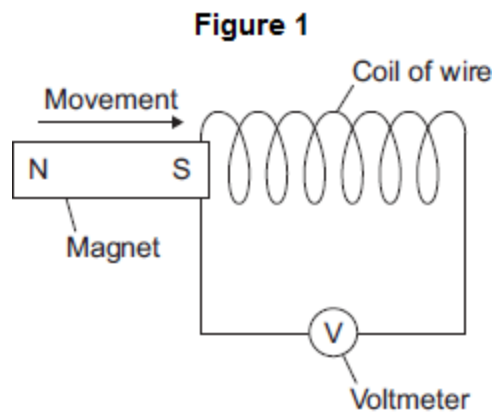
What type of issue does this inequality between people in different countries raise?

(1)

(Total 6 marks)

2.

Figure 1 shows a magnet moving into a coil of wire. This movement causes a reading on the voltmeter.



(a) Use the correct word from the box to complete the sentence.

generated	induced	produced
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Moving the magnet into the coil of wire causes a reading on the voltmeter because a potential difference is _____ across the ends of the wire.

(1)

- (b) A student investigated how the number of turns on the coil of wire affects the maximum voltmeter reading. The student changed the number of turns on the coil of wire, then moved the magnet into the coil. The student recorded the maximum voltmeter reading.

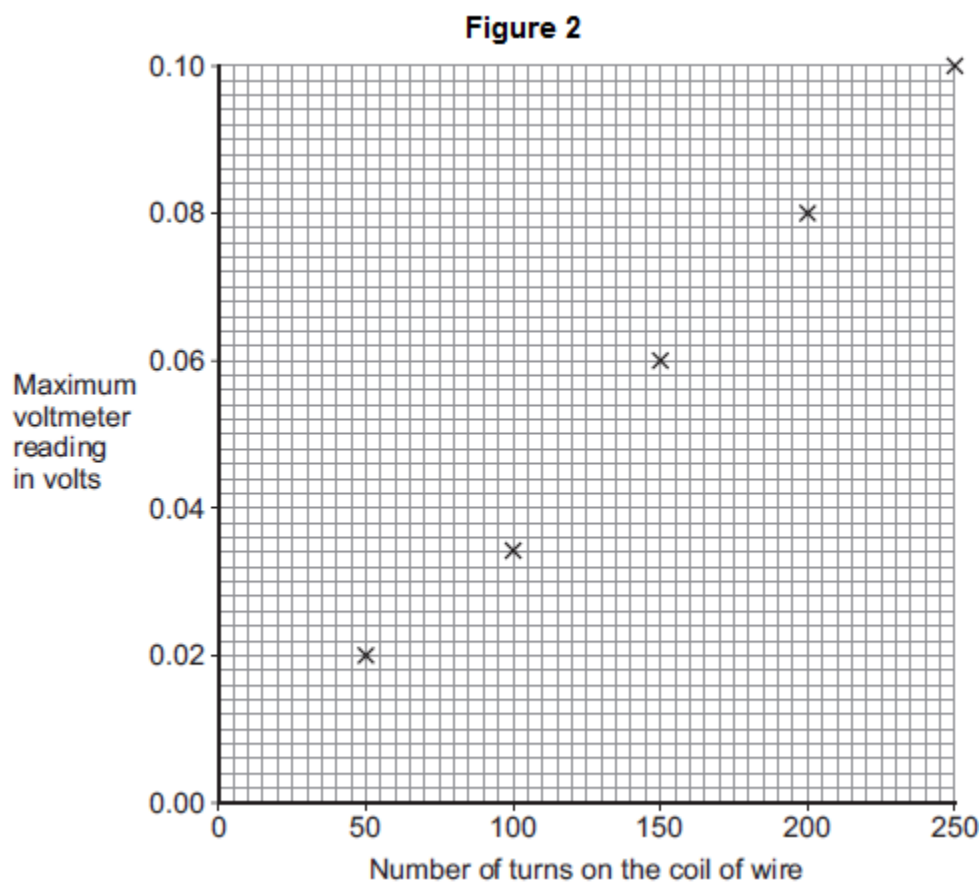
To obtain valid data, suggest **two** variables that the student should control in this investigation.

1. _____

2. _____

(2)

- (c) The student's results are shown in **Figure 2**.



- (i) One of the results is anomalous.
Suggest a reason for the anomalous result.

(1)

- (ii) Draw a line of best fit on **Figure 2**.

(1)

(d) A data-logger can automatically record and store data.

It may have been better for the student to have used a data-logger in his investigation rather than a voltmeter.

Suggest **one** reason why.

(1)

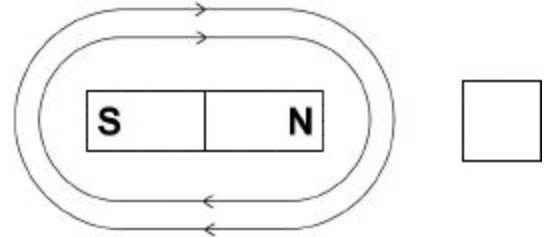
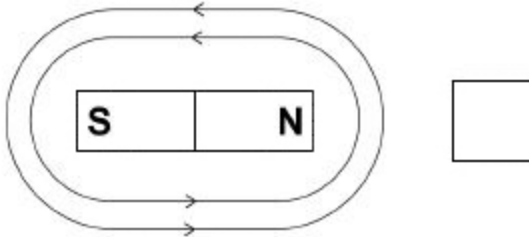
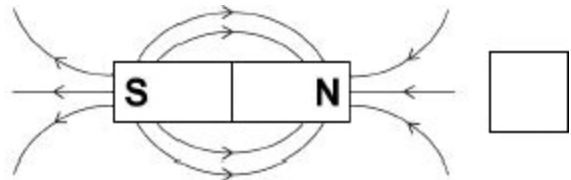
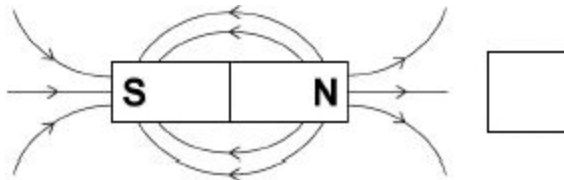
(Total 6 marks)

3.

A magnet produces a magnetic field.

(a) Which diagram shows the magnetic field pattern around a bar magnet?

Tick **one** box.



(1)

(b) **Figure 1** shows three metal blocks.

The blocks are not labelled.

One block is a permanent magnet, one is iron and one is aluminium.

Figure 1

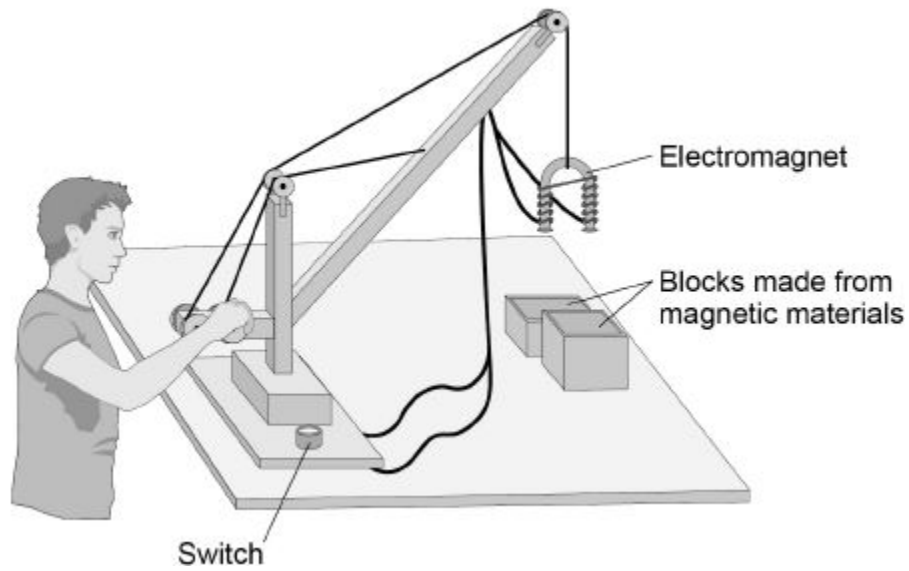


Describe how another permanent magnet can be used to identify the blocks.

(3)

(c) **Figure 2** shows a toy crane.

Figure 2



The toy crane uses an electromagnet to pick up and move the blocks.

Explain how this electromagnet is able to pick up and move the blocks.

(6)
(Total 10 marks)