Simple Phenomena of Magnetism

Question Paper

Course	CIE IGCSE Physics
Section	4. Electricity & Magnetism
Topic	Simple Phenomena of Magnetism
Difficulty	Easy

Time Allowed 40

Score /33

Percentage /100

Question 1a

Some students plot the magnetic field lines around a bar magnet. They have the apparatus shown in Fig. 9.1 and a large sheet of paper.

Fig. 9.1

Describe how the students use the apparatus in Fig. 9.1 to show the pattern of the magnetic field lines around the bar magnet.

You may draw a diagram to assist with your description.

[3 marks]

Question 1b

Draw at least four lines above and below the bar magnet in Fig. 9.2 to show the magnetic field around the bar magnet. Draw an arrow on the field lines to show the direction of the magnetic field.

Fig. 9.2

[3 marks]

Question 2a

When the poles of two bar magnets are brought close together, the magnets will experience either an attraction or a repulsion.

Complete Table 1.1 by writing either attract or repel in the effect column.

Orientation of bar magnets	Effect
	
	
	
	

Table 1.1

[4 marks]

Question 2b

State which item will experience an attraction or repulsion when

(i) a magnetic material is brought close to the north pole of a magnet.

[1]

(ii) a magnetic material is brought close to the south pole of a magnet.

[1]

[2 marks]

Question 2c

State one use of a permanent magnet.

[1 mark]

Question 2d

State four magnetic materials that would be attracted to a magnet.

[4 marks]

Question 3a

Describe a method for drawing the magnetic field around a bar magnet using iron filings.

[4 marks]

Question 3b

Define the term *magnetic field*.

[1 mark]

Question 3c

State the direction of magnetic field lines.

[1 mark]

Question 3d

Extended tier only

Sketch the magnetic field lines for the two bar magnets shown in Fig. 1.1.

Fig. 1.1

[3 marks]

Question 4a

When a magnetic material is placed in a magnetic field, that material can become a temporary magnet.

Tick **one** box that correctly names this effect.

- ☐ magnetic attraction
- ☐ electromagnetism
- ☐ induced magnetism

[1 mark]

Question 4b

Identify the magnetic materials from the list below.

Tick **all** that apply.

- ☐ iron
- ☐ copper
- ☐ aluminium
- ☐ steel

[1 mark]

Question 4c

Fig. 1.1 shows a magnetic material being brought into the magnetic field of a permanent magnet.

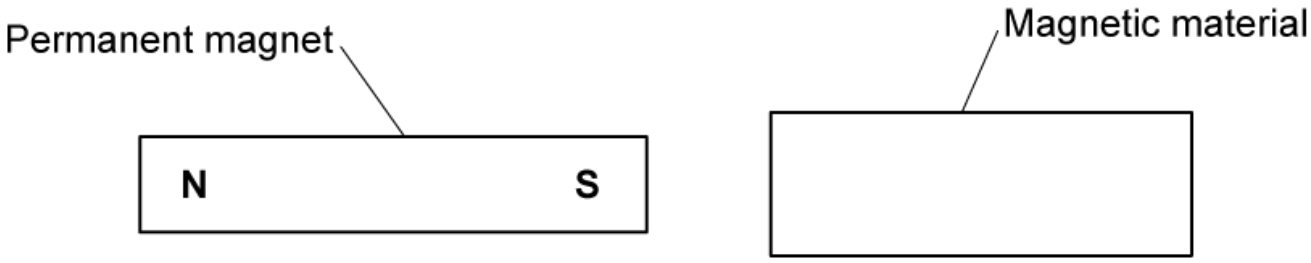

Fig. 1.1

Draw, on Fig. 1.1, the temporary poles that will be induced in the magnetic material.

[1 mark]

Question 4d

Fig. 1.2 shows a chain of paperclips being suspended from a magnet.

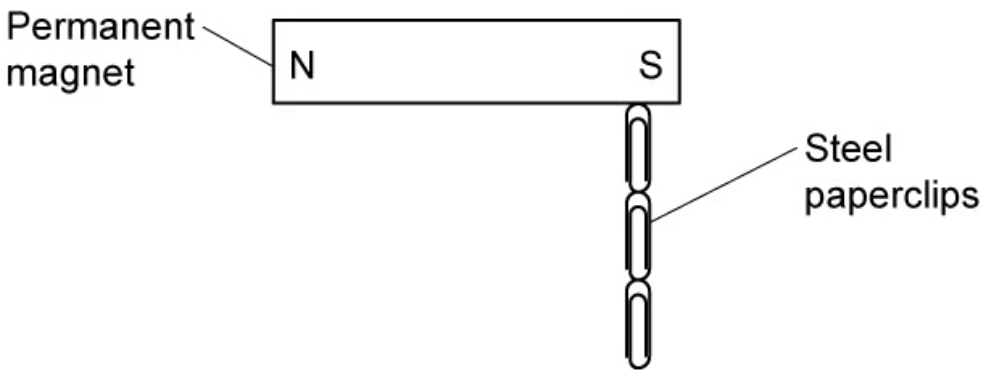

Fig. 1.2

Complete the paragraph explaining how this is possible.

Choose words from the list below.

temporary magnetic permanent poles attracted

magnetised repelled non-magnetic

The paperclips are made of steel which is a ..... material. The paperclips are ..... to the permanent magnet. The magnetic field induces temporary ..... in the paperclips and they become ..... magnets.

[4 marks]