Magnetism and electromagnetism – GCSE Physics Paper 2

1. No.1

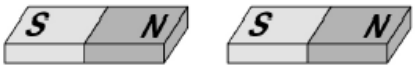
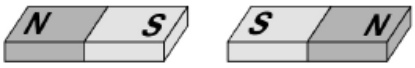
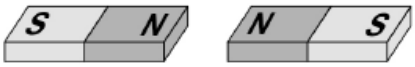
0 1 When two magnets are close together they exert a force on each other.

0 1 . 1 Complete **Table 1** to show if the magnets would attract or repel.

[2 marks]

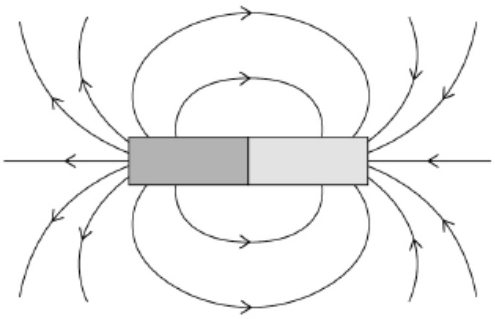
Tick (✓) **one** box in **each** row.

Table 1

	Attract	Repel
		
		
		
		

0 1 . 2 **Figure 1** shows the magnetic field around a bar magnet.

Figure 1



Which statements are true for the magnetic field shown in **Figure 1**?

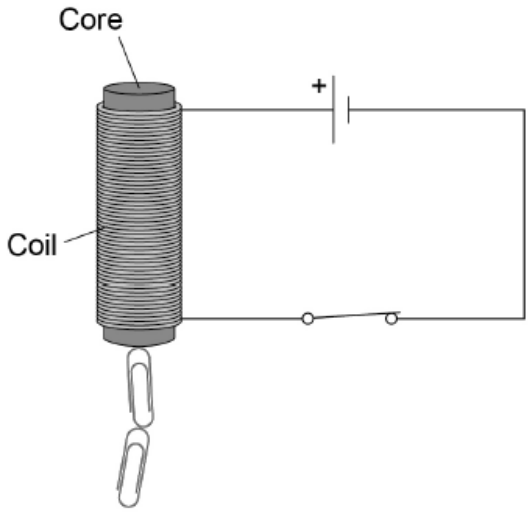
[2 marks]

Tick (✓) **two** boxes.

- The magnetic field gets weaker further from the magnet. ☐
- The magnetic field is strongest at the poles. ☐
- The magnetic field is uniform away from the poles. ☐
- The magnetic field lines all meet at a single point. ☐
- The magnetic field lines point from south to north. ☐

Figure 2 includes an electromagnet.

Figure 2



0 1 . 3 Which metal is used to make the core of the electromagnet?

[1 mark]

Tick (✓) **one** box.

Aluminium ☐

Copper ☐

Iron ☐

Magnesium ☐

0 1 . 4 Complete the sentence.

Choose the answer from the box.

[1 mark]

coil	metal core	paper clip

The switch is closed. There is a current in the _____.

0 1 . 5 The number of turns on the coil is increased. The current remains the same.

How does this affect the strength of the magnetic field around the electromagnet?

[1 mark]

Tick (✓) **one** box.

The magnetic field would be stronger. ☐

The magnetic field would stay the same. ☐

The magnetic field would be weaker. ☐

0 1 . 6 The metal core was removed. The current remains the same.

How does this affect the strength of the magnetic field around the electromagnet?

[1 mark]

Tick (✓) **one** box.

The magnetic field would be stronger. ☐

The magnetic field would stay the same. ☐

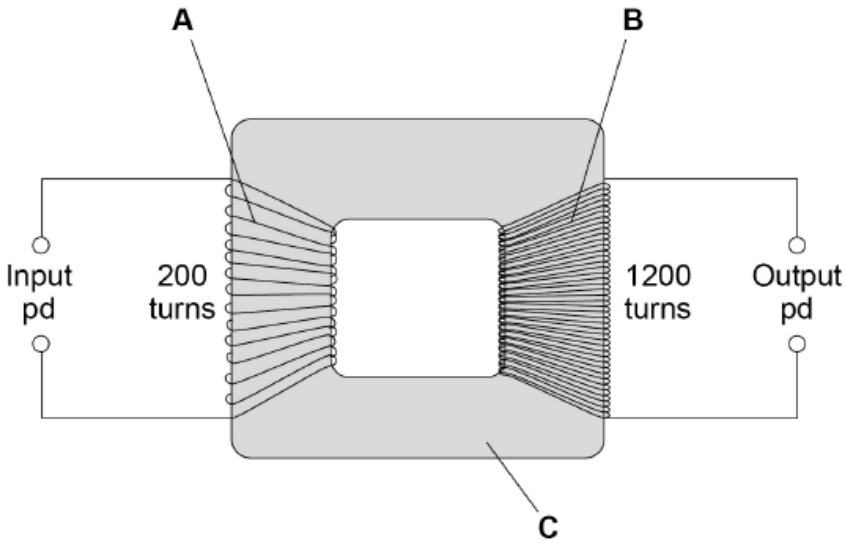
The magnetic field would be weaker. ☐

2. No.7

0 7 The National Grid uses transformers to change potential difference (pd).

Figure 12 shows a transformer.

Figure 12



0 7 . 1 Identify the parts of the transformer labelled in **Figure 12**.

[2 marks]

A _____

B _____

C _____

0 7 . 2 There is an alternating input pd of 230 V.

Determine the output pd.

Use the Physics Equations Sheet.

[3 marks]

_____

_____

_____

_____

_____

Output pd = _____ V

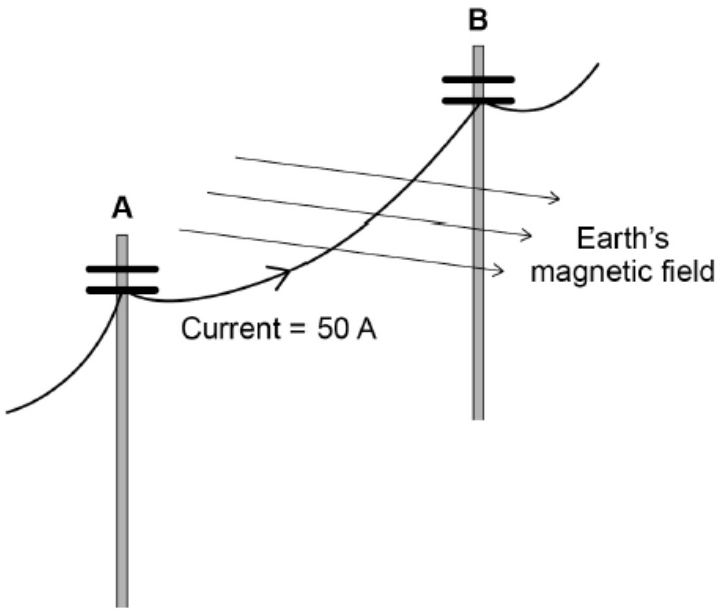
0 7 . 3 The input pd causes an alternating current.

Explain why there is an alternating current in the output when the transformer is connected to a circuit.

[3 marks]

Figure 13 shows a large cable supported by two wooden poles. The cable is connected to an electricity supply.

Figure 13



0 7 . 4 There is a force on the cable due to the Earth's magnetic field when the current is in the direction **A** to **B**.

What is the direction of this force?

[1 mark]

Tick (✓) **one** box.

Down ☐

Left ☐

Right ☐

Up ☐

0 7 . 5 The cable experiences a force of 0.045 N due to the Earth's magnetic field.

magnetic flux density = 60 μT

current = 50 A

Calculate the length of the cable between **A** and **B**.

Use the Physics Equations Sheet.

[4 marks]

Length = _____ m

0 7 . 6 State **one** assumption you made in your calculation.

[1 mark]