

Magnets and Magnetic Fields

Questions:

Total mark – 25

1.

Which action **increases** the strength of an electromagnet?

- A Decreasing the current
- B Decreasing the number of turns of wire
- C Increasing the number of turns of wire
- D Using a copper core

Your answer

[1]

2.

(a). A student investigates solenoids and writes the following:

Solenoids

Solenoids are coils of wire.

When a voltage flows through them a magnetic field is created.

The magnetic field can be increased by decreasing the number of turns or by increasing the current.

The student makes **two** mistakes.

Put a **ring** around the **two** mistakes in the above box.

[2]

(b). Draw the magnetic field pattern between the North and South poles of the magnets.

Include arrows on your field lines.

N

S

[3]

(c). Describe **one difference** between a permanent magnet and an induced magnet.

[1]

3.

(a). Two students, **A** and **B**, use different methods to see magnetic field patterns.

i. Describe how student **A** can use a compass to plot a magnetic field pattern.

You may draw a diagram to help you answer this question.

[3]

ii. Student **B** uses iron filings to show a magnetic field pattern.

Describe how student **B** uses iron filings to show a magnetic field pattern.

You may draw a diagram to help you answer this question.

[2]

(b). Their teacher prefers students to use the method proposed by student **A**.

Suggest **one** reason why.

[1]

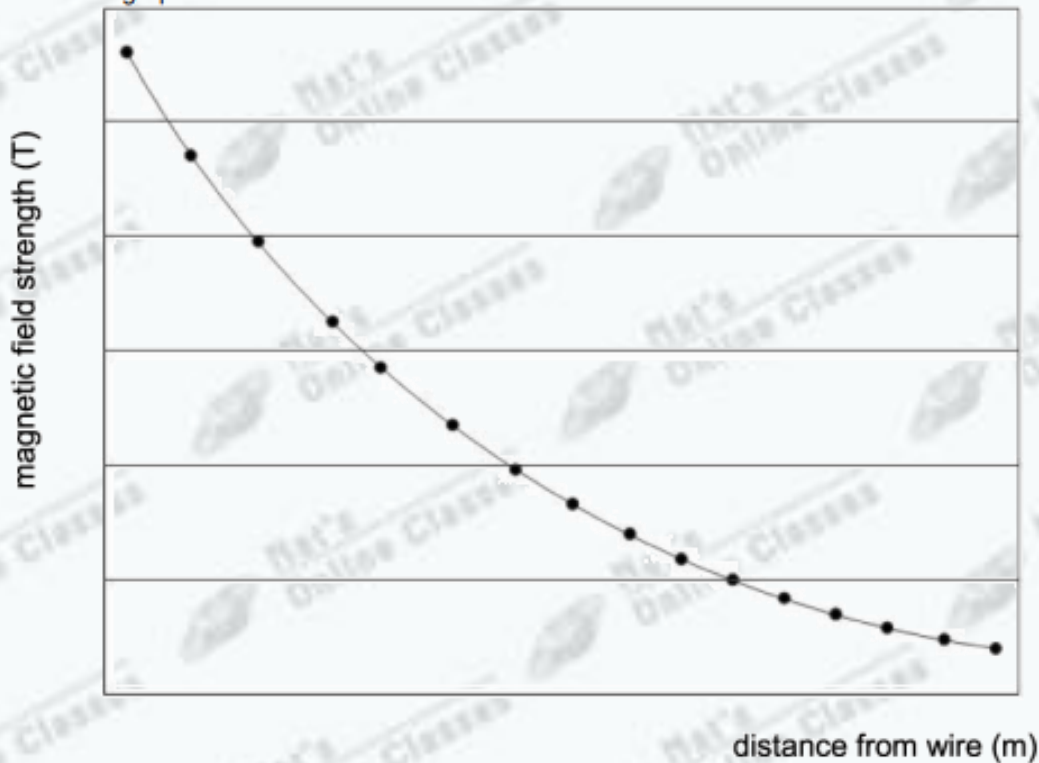
(c). Sketch the field pattern the students found around a bar magnet.



[2]

(d). The two students decide to investigate the magnetic effect of a current-carrying wire.

Look at the graph of their results.



What trend does the graph show?

[2]

4.

The different currents in four wires are shown below. The magnetic field is measured at positions **A**, **B**, **C** and **D**.



Which position will experience the strongest magnetic field?

Your answer

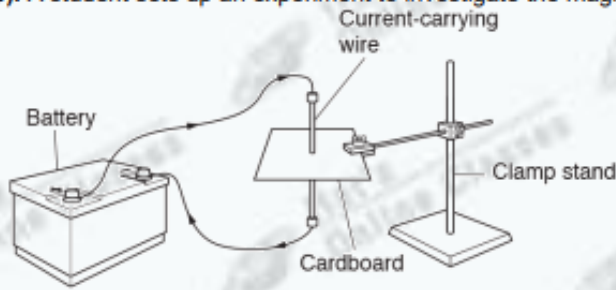
[1]

5.

(a). The behaviour of a magnetic compass is evidence that the core of the Earth is magnetic. Explain why.

[2]

(b). A student sets up an experiment to investigate the magnetic field around a current-carrying wire.



i. Describe how the student could use this experiment and a compass to investigate the magnetic field produced by the wire.

[3]

ii. Draw the shape of the field which would be found around **this** wire.

[2]