5.2 Magnetism and electromagnetism

Name: _____ Class: _____ Date: _____ **Total: 19 marks**

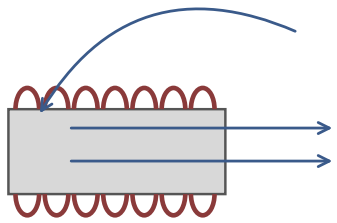
Objective

Cover magnetism and electromagnetism (3.5.2): poles and fields, induced magnetism, the Earth's field, the field around a current, solenoids and electromagnets with the required practical. Original OxfordAQA practice.

1 Key knowledge and worked examples

■ From lodestone to electromagnet

Like poles repel, unlike attract; field lines N→S outside; opposite poles facing give a uniform field. A current makes circular fields; a solenoid makes a bar-magnet field; add a soft-iron core for an electromagnet.



field runs S to N inside the core (arrows right);
outside it loops back to the S end

Stronger electromagnet: more turns, larger current, soft-iron core.

2 Practice

2.1 State the pole rule for attraction and repulsion. [1]

2.2 In which direction do field lines point outside a magnet? [1]

2.3 What is an induced magnet? [2]

2.4 How does a plotting compass detect the Earth's field? [2]

2.5 State three ways to strengthen an electromagnet. [3]

3 Exam-style questions

3.1 Describe the magnetic field pattern around a straight current-carrying wire, and two factors that change it. [3]

3.2 Explain why a solenoid's field is stronger than a single wire's, and what the iron core adds. [3]

3.3 Describe an investigation into the factors affecting an electromagnet's strength, identifying the variable to control. [4]