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GCSE

SINGLE SCIENCE PHYSICS

END OF TOPIC TEST

AQA Physics

Time allowed: 1 hour

Materials
For this paper you must have:

- a ruler
- a calculator

Instructions

- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- There are 52 marks available on this paper.
- The marks for questions are shown beside each question.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

- In all calculations, who clearly how you work out your answer.

Please write clearly, in block capitals:

Surname: _____

Forename(s): _____

Class: _____ Teacher: _____ Date: _____

Q1a Which of the following metals and alloys are magnetic?

Tick all the elements and alloys that are magnetic.

Metal/Alloy	Magnetic
Copper	
Aluminium	
Iron	
Cobalt	
Carbon	
Nickel	
Steel	

3

Q1b Complete the sentence by deleting the incorrect term.

Magnetism is an example of a contact/non-contact force. 1

Q1c There is a magnetic field around a magnet.

Give two ways of finding the magnetic field around a magnet.

_____

_____

_____

_____ 2

Q1d Below is a diagram of a bar magnet.

Draw the magnetic field around the magnet.

3

Q1f Below is an image of the Earth.

A magnet has been placed on the Earth.

What is wrong in the picture?

_____

_____

_____

_____ 2

Q2a Some magnets are said to ‘permanent’ and others are said to be ‘induced’.

What is the difference between these two types of magnets?

_____

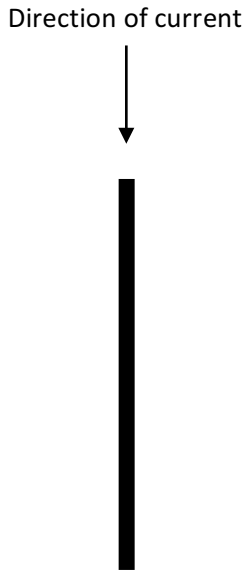
_____

_____

_____ 2

Q2b When an electric current flows through a wire, a magnetic field is produced around the magnet.

Complete the diagram below to show the magnetic field and its direction around the wire.



2

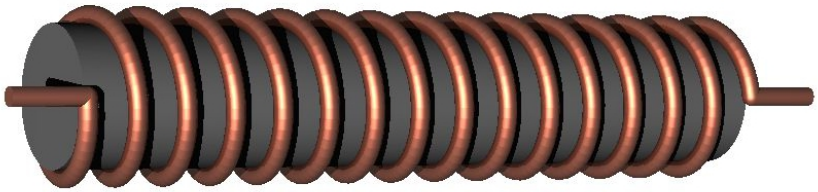
Q2c What effect would changing the direction of the current, through the wire, have upon the magnetic field?

_____

_____

_____ 1

A solenoid is a long coil of wire.



Q2d One way of increasing the strength of the magnetic field is to increase the number of coils.

Give **two other** ways of increasing the strength of the magnetic field produced by a solenoid:

_____

_____

_____

_____

_____

_____ 2

A student wanted to investigate the how the strength of an electromagnet changed with the number of coils.

The student setup a simple electromagnet and tested its strength by seeing how many paperclips it could hold.

The student results are shown below:

Number of coils	Number of Paper clips held
0	0
20	8
40	18
60	31
80	46

Q2e What conclusion can the student make from these results.
You should include supporting results.

_____

_____

_____

_____ 2

Q2f Why would comparing results with other students, doing the same experiment, be beneficial?

_____

_____

_____

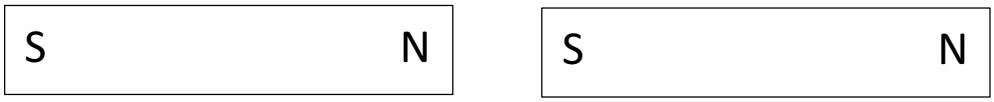
_____ 3

_____

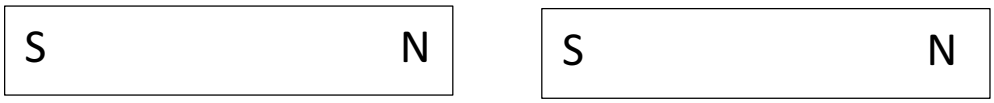
Q3 The diagrams below show two sets of different magnets.

The magnets in set 1 are much **stronger** than those in set 2.

Set 1



Set 2



Q3a On the above diagram, draw the **magnetic flux** between the magnets. 4

Q3b The strength of the magnetic force is determined by the flux density.

What name is given to the standard unit for measuring flux density, given the symbol **T**? _____ 1

Q3c What is the equation that links current, length, force and magnetic flux density?

_____

_____

_____ 1

Q3d A wire carrying 3.0A is placed between the two magnets, of length 15cm, shown in Set 1 above.

Calculate the force acting on the wire when the magnetic flux density is 0.3T

_____

_____

_____

_____

_____

_____ 4

Q4 A piece of Aluminium is placed between two strong magnets.

Current is passed through the Aluminium which causes it to move downwards.

Q4a Explain why the Aluminium is forced downwards when current is passed through the Aluminium.

_____

_____

_____

_____ 2

Q4b The force acting on the Aluminium can be increased by changing which **two** factors?

_____

_____

_____

_____ 2

Q4c A prediction can be made about which direction the Aluminium will move.

Explain how we can predict the direction that the Aluminium will move.

_____

_____

_____

_____

_____

_____

_____

_____ 4

Q5 An electric motor is made of a coil of wire between two magnets.

The coil rotates about an axle when a current flows.

Explain how an electric motor works.

You should include any relevant diagrams to assist with your explanation. 6

Q6 Describe and explain the life cycle of a star that is bigger than our Sun from being a main-sequence star. 5