

# MARK SCHEME

# GCSE

## PHYSICS

## AQA - TRIPLE SCIENCE

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P7 - TEST 2  
MAGNETISM  
Beginner



## Mark schemes

1.

- (a) top of each paper clip labelled N / north

*both parts required*

**and**

bottom of each paper clip labelled S / south

1

- (b) so the paper clips have the same weight / mass

1

which allows the results for different numbers of turns to be compared (fairly)

*allow fair test*

*allow the control variable (is the weight / mass of a paper clip)*

*allow to obtain valid results*

*ignore accurate results*

1

- (c) as the number of turns increases so does the number of paper clips (held)

*allow positive correlation*

1

in a linear pattern

*directly proportional scores 2 marks*

*allow a correct description of directly proportional for 2 marks*

1

- (d) some of the paper clips were already magnetised

1

- (e) discount the result of 18

*ignore repeat experiment / measurements*

1

as the three new results are similar (and not close to 18)

1

and use 15 (the mean of the new results)

*allow find the mean of the remaining results (16, 14 and 15)*

*if no other marks have been awarded: calculate the mean (of all four results) (1)*

*round down to 15 (1) – this mark only scores if the mean of 15.75 has been calculated*

1

- (f) keep number of turns constant  
*allow a specific number of turns* 1
- (use the variable resistor to) change the current (several times)  
*change the p.d. is insufficient* 1
- (for each current value) count how many paper clips the electromagnet will hold 1

[12]

2.

- (a) motor 1
- (b) increase the strength of the magnetic field  
*accept use a stronger magnet*  
*use a larger / bigger magnet is insufficient*  
*do **not** accept move magnets closer* 1
- increase the (size of the) current  
*accept use a current greater than 2 (A)*  
*accept increase the p.d. / voltage (of the power supply)*  
*increase the power supply is insufficient* 1
- (c) any **one** from:  
 • (reverse the) direction of the current  
*accept swap the wires at the power supply connections*  
*swap the wires around is insufficient*  
 • (change the) direction of the magnetic field  
*accept turn the magnet around*  
*do **not** accept use an a.c. supply* 1
- (d) The wire is parallel to the direction of the magnetic field. 1

[5]

<b>3.</b>	(a) (i) increase	1
	(ii) A and B and B and C  <i>both required for the mark either order</i>	1
	(iii) any <b>two</b> from: <ul style="list-style-type: none"> <li>• size of nail <b>or</b> nail material <i>allow (same) nail</i></li> <li>• current <i>allow (same) cell allow p.d. same amount of electricity is insufficient</i></li> <li>• (size of) paper clip</li> <li>• length of wire <i>accept type / thickness of wire</i></li> </ul>	2
	(b) 4	1
	B picks up the same number as C, so this electromagnet would pick up the same number as A <b>or</b> direction of current does not affect the strength of the electromagnet <i>allow it has got the same number of turns as A</i>	1
	(c) 2  <i>allow 1 or 3</i>	1
		<b>[7]</b>
<b>4.</b>	(a) (i) 9000  <i>an answer of 9 k(N) gains 1 mark</i>	1
	(ii) increase  <i>accept other comparative terms, eg give a bigger affect / change is insufficient</i>	1

(iii) smaller  
*accept other comparative terms, eg less*

1

(b) Q N M

*all three in correct boxes*

*one statement in correct box gains 1 mark*

2

(c) any **two** from:

- increase the current / p.d. (supplied to the coil)  
*accept reduce the resistance of the coil **or** increase cross sectional area of wire*  
*accept more cells / batteries **or** turn up the power supply*  
*increase power is insufficient*
- increase number of turns (on the coil)
- increase the area (of the coil)  
*accept increase the width of the coil*  
*increase width / size is insufficient*
- increase the (strength of the permanent) magnetic field  
*accept move the magnets closer to the coil*  
*accept use stronger magnets*  
*do **not** accept use larger magnets*

2

(d) an economic

1

**[8]**

**5.**

(a) (i) iron

1

(ii) step-down (transformer)

1

(b) any **one** from:

- after the power station
- after the generator
- before the power lines
- before the pylons

1

- (c) each correct (1)  
*in its correct place*

current

coil

field

core

ends

5

[8]

6.

- (a) step-down (transformer)

1

- (b) alternating current

*accept minor misspellings but  
do **not** credit 'alternative current'*

1

- (c) (i)(ii) magnet

attracts

upwards

*correct order essential  
accept 'up'*

3

[5]

7.

- (a) iron

*accept any unambiguous correct indication*

1

- (b) (i) step-down (transformer)

*do **not** accept down step or a description*

1

- (ii) less than

*accept any unambiguous correct indication*

1

- (c) (i) 2000

1

- (ii) There is no pattern.

1

[5]