

MARK SCHEME

GCSE

PHYSICS

AQA - COMBINED SCIENCE

P7 - TEST 4

MAGNETISM AND ELECTROMAGNETISM

Intermediate

Mark schemes

- 1.** (a) (i) an electrical conductor 1
- (ii) increase current 1
accept increase p.d. / voltage
or
use stronger magnets
accept move magnets closer
do not accept use larger magnets
- (iii) reverse the poles / ends (of the magnet) 1
either order
- reverse the connections (to the power supply) 1
- (b) (i) environmental 1
- (ii) ethical 1
allow political (instability)
allow economic (migration)
- [6]**
- 2.** (a) induced 1
- (b) any **two** from:
- use the same (strength) magnet
same size magnet is insufficient
 - the speed that the magnet is moved
accept movement of the magnet
 - the area of the turns
same type / length of wire is insufficient
 - the magnetic pole being moved towards the coil (of wire).
use the same voltmeter is insufficient
- 2
- (c) (i) voltmeter misread 1
or
number of turns miscounted
result misread is insufficient
human error is insufficient
allow the magnet was moved at a (slightly) different speed (into the coil) than for the other readings
allow spacing between the turns had changed

(ii) line of best fit passing through all points except (100, 0.034)
line does not need to go back to origin

1

(d) any **one** from:

- can re-check data / readings.
accept can go back to data
- can take more readings (in a given time)
can store data is insufficient
- easier to identify maximum value.
automatically records data is insufficient
accept is more accurate
accept eliminates human error

1

[6]

3.

(a) 1st box ticked

1

(b) (permanent magnet) has no effect on the aluminium

1

iron is attracted (to the permanent magnet)

1

(only) the (permanent) magnet can be repelled (by the permanent magnet)

1

(c) **Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to give a clear account.

5–6

Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logically linking. The resulting account is not fully clear.

3–4

Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

1–2

No relevant content

0

Indicative content

- completing the circuit
- turns the electromagnet on

- there is a current in the coil
- a magnetic field is produced around the coil
- the iron core becomes magnetised

- move electromagnet towards the blocks
- the block is attracted to the electromagnet
- moving the crane moves the block

- switching off the current switches off the electromagnet
- releasing the block

[10]