



Unit 8 • Electricity and Magnetism

Full marks 29

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. magnetic substance
2. magnetic field
3. poles
4. electromagnet
5. dilute sulphuric acid
6. electrical
7. load
8. fuse

K • 4

Each carries 0.5 mark.

2 Label the diagram

1. copper plate (+)
2. dilute sulphuric acid

3. zinc plate (-)
4. bulb glows

K • 2

Each carries 0.5 mark.

3 Multiple choice

- i. d. dust particles (soil dust)

K • 1

Ordinary dust from the ground is mostly bits of rock and soil, not iron, so a magnet doesn't pull it. The other three are iron.

- ii. c. an electric motor

U • 1

An electric motor uses electricity to make things turn: it is a load. The cells and the generator are sources of electricity.

- iii. b. to change chemical energy into electrical energy

K • 1

A cell changes chemical energy into electrical energy. A bulb or a speaker then changes that into light or sound.

- iv. c. to stop more current flowing than the circuit can safely carry

K • 1

A fuse melts and breaks the circuit when more current flows than the circuit can safely carry, so the wiring doesn't overheat and catch fire.

4 True or false

MARKING SCHEME

K • 2

✓ i. false; ii. true.

✓ iii. true; iv. false.

5 Very short answers

- a. MARKING SCHEME

K • 1

✓ Any two of iron, nickel, cobalt (or steel).

- b. MARKING SCHEME

K • 1

✓ Any two of cell, photocell (solar cell), dynamo, generator.

- c. MARKING SCHEME

U • 1

✓ Any one correct use, e.g. electric bell, motor, crane.



6 Short answers

a. MARKING SCHEME

U · 2

- ✓ Any one difference, e.g. the path complete; a gap in the path.
- ✓ Any second difference, e.g. current flows and the load works; no current, the load doesn't work.

b. MARKING SCHEME

K · 2

- ✓ A continuous path joining a source, conducting wires and a load, through which electricity can flow.
- ✓ Its parts: a source (cell), conducting wires and a load (bulb) (a switch is usually added).

c. MARKING SCHEME

A · 2

- ✓ Correct symbols for the cell, the switch and the bulb.
- ✓ All joined by wires in one loop.

d. MARKING SCHEME

U · 2

- ✓ A melted fuse wire must be replaced with a new one.
- ✓ An MCB switches itself off and is simply pushed back up; nothing has to be replaced.

7 Long answer

ANSWER

U · 4

A magnet made by passing an electric current through a coil of wire wound round a piece of iron; it is a magnet only while the current flows. Wind about 1 m of insulated copper wire round an iron nail, 80 to 100 turns, always in the same direction, and join the wire's bare ends to a dry cell through a switch: while the current flows, the nail picks up pins. It becomes stronger with more turns of wire and with more cells.

MARKING SCHEME

- ✓ A magnet made by passing a current through a coil of wire round iron (a magnet only while the current flows).
- ✓ Insulated copper wire wound round the nail many times in one direction.
- ✓ The ends joined to a dry cell (through a switch): the nail then picks up pins.
- ✓ Stronger with more turns of wire and more cells.

8 Think

ANSWER

HA · 2

It is a **dangerous** idea, and Ronish's father should not do it.

1. A fuse wire is made thin, to melt at a low temperature. A thick copper wire doesn't melt easily, so it would **not** break the circuit when too much current flows.
2. Then the house wiring and the appliances would get very hot, and could be damaged or **catch fire**.
3. A fuse that blows often is a **warning** that something is wrong: too many appliances on at once, or a fault in the wiring or in an appliance.

Instead, he should find the cause: use fewer heavy appliances at the same time, have an **electrician** check the wiring and the appliances, and replace the fuse with a fuse wire of the **right rating** (or fit an MCB).

MARKING SCHEME

- ✓ It is **dangerous**: a thick copper wire won't melt, so when too much current flows the wiring and appliances get very hot and may catch fire.
- ✓ He should find the cause (too many appliances, a fault), have an electrician check it, and use a fuse wire of the right rating (or an MCB).



9 Activity: Which things does a magnet pull?

(not marked)

WHAT STUDENTS SHOULD FIND

The iron nail and the steel pin are pulled (iron and steel are magnetic). Aluminium foil, copper wire and a brass key are metals, but they are not pulled; the eraser (rubber) is not pulled either.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	15	10	2	2	29

