MARK SCHEME

GCSE

PHYSICS

AQA - COMBINED SCIENCE

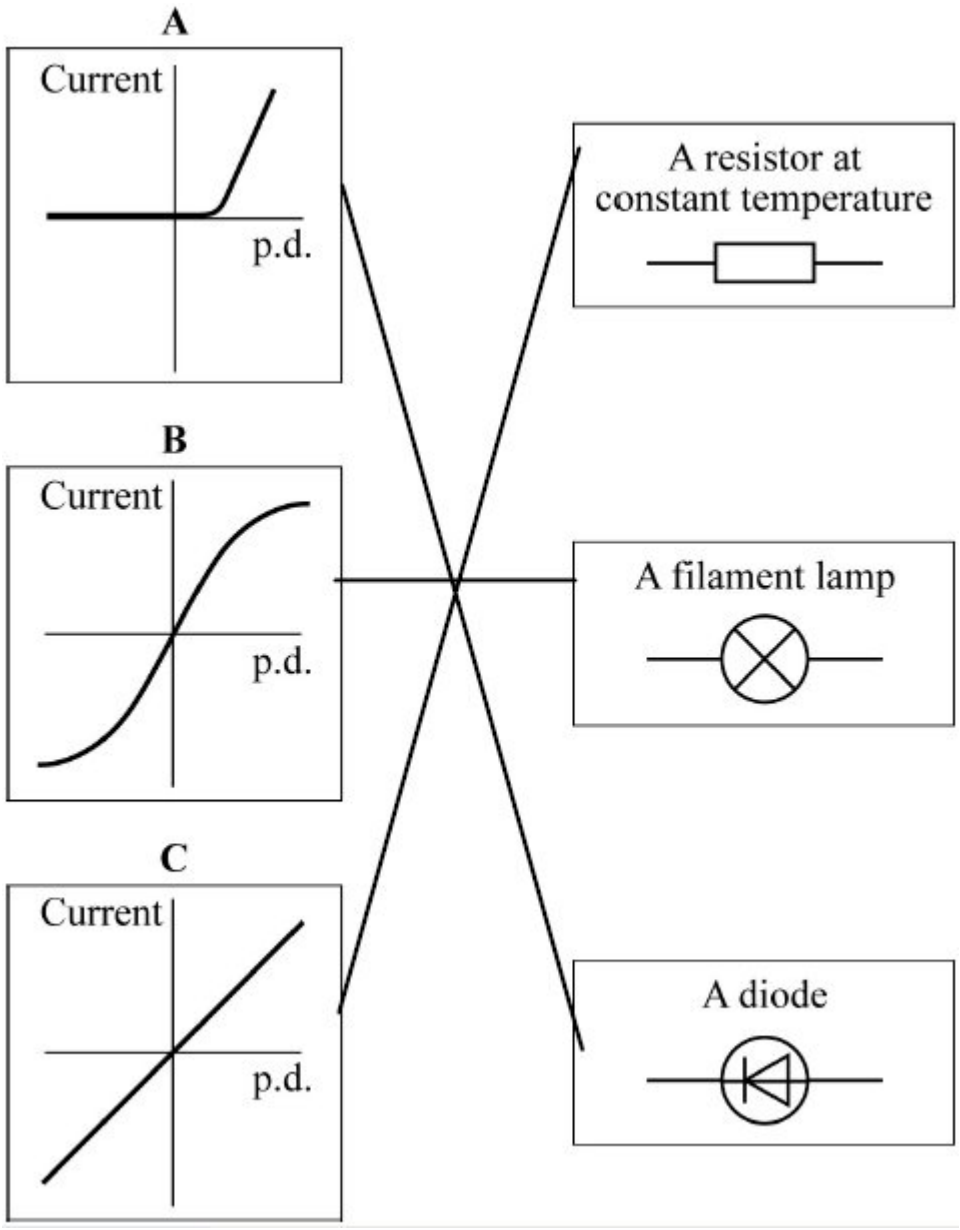
P2 - TEST 1

ELECTRICITY

Beginner

Mark schemes

1. (a) **three** lines drawn correctly



*allow **1** mark for 1 correct line*

if more than one line goes from a graph, both are incorrect

2

(b) **J**

1

[3]

2. (a) switch

allow answer circled in box

1

(b) 24

1

(c) equal to 0.25 A

1

(d) 4

1

[4]

3.

(a) (i) diode

[Do not accept 'rectifier' or LED]

(ii) lamp / bulb / light

each for 1 mark

2

(b) • P = voltage / potential difference / p.d. / volts / V

[Allow 'Voltmeter]

• Q = current / amperes / amps / A

[Allow 'ammeter]

each for 1 mark

2

[4]

4.

(a) ammeter anywhere in series in the circuit

accept just letter A or box with A

voltmeter across **or** in parallel with the fixed resistor only

accept just letter V or box with V

2

(b) (i) four correct plots

deduct one for any incorrect plot

a straight line through the points

no requirement to extrapolate through origin

*do not credit bar charts unless correct line drawn **or** correct points*

2

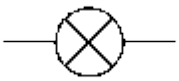
(ii) 0.25

ecf rule applies if graph is wrongly plotted

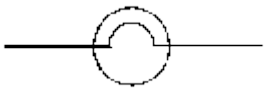
1

[5]

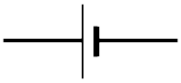
5. (a) circuit symbol for a lamp correct



accept



accept any standard of drawing providing circuit would work



1

circuit symbol for a cell correct

1

2 lamps drawn in parallel with 3 cells

polarity of cells must be correct (+ to –) but cells may be either way around

1

(b) 4.5

1

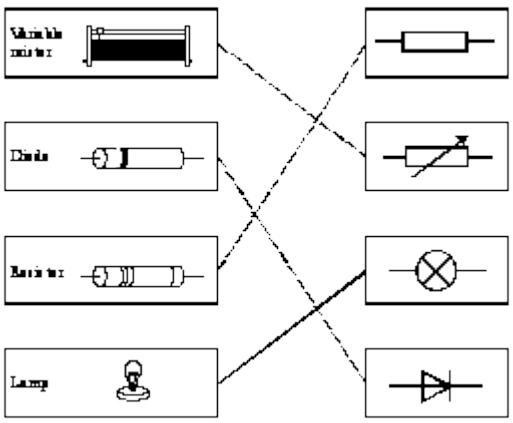
(c) the same as

accept any clear indication of the correct answer

1

[5]

6. (a) all 3 lines drawn correctly



(1only correct, 1 mark)

deduct one mark if more than one line from or to a single box

2

(b) (i) series

1

(ii) any **one** from:

- both lamps **or** lights must be on together
- if one blows, the other goes out
- switch controls both bulbs

*do **not** accept bulbs dimmer*

1

(iii) any **two** from

- each lamp **or** light can be switched on independently
- if one lamp blows the other stays on
- switching the second lamp on does not affect brightness of first **or** bulbs brighter (than in first circuit) or energy explanation

2

[6]

7. (a) **A**

1

(b) **C**

1

(c) **C**

1

(d) **B**

1

(e) a series circuit has only one path/loop/branch

1

a parallel circuit has a branch(es) to provide more than one path / loop

allow answers that describe the difference in terms of potential difference, current or resistance

1

(f) **R**

1

(g) **P**

1

(h) Q = 0.97 × 60

1

Q = 58.2 (C)

1

Q = 58 (C)

*an answer of 58 (C) scores **3** marks*

1

[11]

8. (a) 230 V

1

(b) Earth

must be in the correct order

1

Neutral

1

(c) It is easy to identify each wire.

1

(d) current

must be in the correct order

1

shock

1

(e) 50 Hz

1

(f) output = 25 × 16

1

400 (kV)

1

*allow 400 (kV) with no working shown for **2** marks*

(g) It reduces the energy lost due to heating

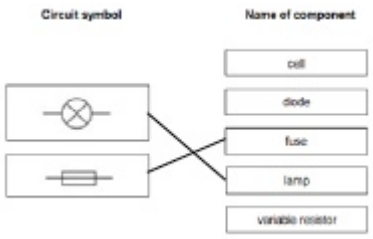
1

(h) It is safer for consumers

1

[11]

9. (a)



extra lines from circuit symbols negate the mark

1
1

(b) charge

1

(c) 0.13 (A)

1

(d) 0.56 × 300

1

168 (C)

*an answer of 168 (C) scores **2** marks*

1

(e) 168 × 4.5

1

756 (J)

an answer of 756 (J) scores 2 marks
allow ecf from part (d)

1

(f) decreases to zero

allow reads zero

1

(g) (A1) decreases to zero

allow reads zero

1

(A2) decreases

*do **not** accept 'to zero' for A2*

1

(h) thermistor

1

(i) answer in range 160–165 (Ω)

1

[13]

10. (a) 2100 W

1

(b) power = potential difference × current

1

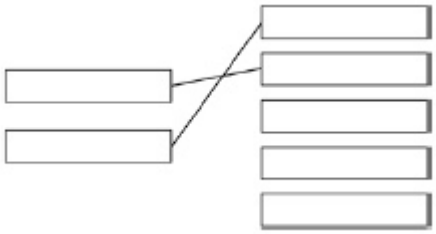
(c) 50 (Hz)

1

(d) direct current (dc) only

1

(e)



1

1

(f) green **and** yellow

both colours required

1

(g) any **two** from:

- good conductor
- hard
- corrosion resistant

2

(h)

Level 2: Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	3-4
Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1-2
No relevant content	0
Indicative content allow voltage / volts / pd for potential difference • cables transmit electricity at very high potential differences • transformers change the potential difference • step up transformer increases potential difference • overhead cables transfer electricity at a higher potential difference • step down transformer decreases potential difference • the potential difference to the consumers is much lower than the potential difference from the power station • the potential difference to the consumers is much lower than the potential difference in the cables	

4

[13]