

Domestic Uses and Safety

Mark Scheme 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.2 Electricity
Sub-Topic	Domestic Uses and Safety
Difficulty Level	Bronze Level
Booklet	Mark Scheme 1

Time Allowed: 56 minutes

Score: /54

Percentage: /100

Grade Boundaries:

M1.(a)	230 V	1
(b)	Earth <i>must be in the correct order</i>	1
	Neutral	1
(c)	It is easy to identify each wire.	1
(d)	current <i>must be in the correct order</i>	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]

M2.(a) 50 Hz

1

(b) Top: Earth

1

Bottom: Neutral

1

(c) potential difference

1

current

1

(d) energy = 2500×180

1

= 450 000

1

= 450 kJ

1

allow 450 with no working shown for 3 marks

- (e) energy transferred = charge flow \times potential difference
allow $E = QV$

1

- (f) $4\,200 = Q \times 230$

1

$$Q = 4\,200 \div 230$$

1

$$= 18.3 \text{ (C)}$$

1

allow 18.3 with no working shown for 3 marks

[12]

- M3.(a)** (i) any **six** from:

- switch on
- read both ammeter and voltmeter
allow read the meters
- adjust variable resistor to change the current
- take further readings
- draw graph
- (of) V against I
allow take mean
- $R = V / I$
allow take the gradient of the graph

6

- (ii) resistor would get hot if current left on

1

so its resistance would increase

1

(iii) 12 (V)

0.75 × 16 gains 1 mark

2

(iv) 15 (Ω)

1

16 is nearer to that value than any other

1

(b) if current is above 5 A / value of fuse

1

fuse melts

allow blows / breaks

*do **not** accept exploded*

1

breaks circuit

1

[15]

M4.(a) (i)

Wire	Plug terminal
Live	C
Neutral	A
Earth	B

all 3 correct for **2** marks
allow **1** mark for 1 correct

2

- (ii) plastic
or
rubber

accept:

ABS
UF / urea formaldehyde
nylon
PVC

1

- (b) (i) 600

allow **1** mark for correct substitution,

30 000

ie $P = \frac{30\,000}{50}$

provided no subsequent step

2

- (ii) power is greater than 820 (W)

power is 1200 W is insufficient

1

the lead / cable / wire will overheat / get (too) hot

accept lead / cable will melt

may overheat / get hot is insufficient

1

so there is a risk of fire

accept causing a fire

1

- (c) X

any **one** from:

- most / more efficient
- smallest energy input (per second)
- cheapest to operate

mark only scores if X is chosen

mark is for the reason

accept smallest input (power) for same output (power)

accept wastes least energy

smallest (power) input is insufficient

uses least electricity is insufficient

1

[9]

M5.(a)	(i)	50 (Hz)		1
	(ii)	2760 (W)		1
	(b)	12	<i>allow 1 mark for correct substitution, ie 2400/200 or allow 1 mark for 2760/230 provided no subsequent step shown</i>	2
		amps		1
	(c)	the charge is <u>directly</u> proportional to the time switched on for <i>accept for 1 mark the longer time (to boil), the greater amount of charge or positive correlation or they are proportional</i>		2
				[7]