

Mark schemes

1.

- (a) pin
made from brass because it is (hard and) a (good electrical) conductor
accept copper for brass
metal is insufficient
heat conductor on its own negates

1

outer case
plastic/rubber because it is a (good electrical) insulator
heat insulator on its own negates

1

- (b) (i) live

1

(ii) makes it hot/warm
melts is insufficient

1

- (iii) 8.7

accept an answer that rounds to 8.7
allow 1 mark for correct substitution ie $2000 = 230 \times I$
an answer of 0.0087 or 0.009 or 3.0(4) or 5.65 or 5.7 gains 1 mark

2

- (c) a (large) current goes from the live wire to the earth wire
accept metal case for live wire
accept a current goes from live to earth
do not accept electricity for current

1

(which causes) the fuse to (overheat and) melt

accept blow for melt
break is insufficient
do not accept snap / blow up for melt

1

- (d) reduce chance of an electric shock

accept to reduce the risk of an accident
accept prevent electric shock
accept prevent electrocution
accept prevent or reduce the risk of an (electrical) fire
accept an electric shock can kill you
accept it can kill you
accept so you can use it safely

1

[9]

2.	(a)	charge	1
	(b)	(i) blue	1
		(ii) earth wire	1
		fuse	1
	(c)	(i) case is non-metal / non-conducting / plastic / insulator <i>must refer to case / outside of appliance</i> <i>do not accept plastic coating / covering</i>	1
		(ii) earth (wire)	1
	(d)	(i) 60 (W) <i>$P = 3 \times 20$ gains 1 mark</i> <i>provided no subsequent step shown</i>	2
		(ii) 15 <i>$300 = 20 \times Q$</i> or <i>$20 = 300 / Q$ gains 1 mark</i>	2
		C / coulombs <i>must clearly be upper case C accept J / V or As</i>	1
			[11]
3.	(a)	(i) (3-pin) <u>plug</u> <i>do not accept plug socket</i>	1
		(ii) live and neutral	1
		(iii) double	1
	(b)	direct current (d.c.) only	1

(c) (i) live

1

(ii) too great a current flows

accept a surge of current

accept too great a power

accept an electrical fault

do not accept voltage / energy / electricity too high

1

(iii) can be reset

accept does not need replacing

1

(disconnects circuit) faster

cheaper is insufficient

does not melt is insufficient

quicker to fix / replace is insufficient

1

[8]

4.

(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,

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

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]

5.

- (a) (i) 50 (Hz)

1

- (ii) 2760 (W)

1

- (b) 12

allow 1 mark for correct substitution, ie 2400/200

or

allow 1 mark for 2760/230 provided no subsequent step shown

2

amps

1

- (c) the charge is directly proportional to the time switched on for
accept for 1 mark the longer time (to boil), the greater amount of charge
or positive correlation
or they are proportional

2

[7]

6.

- (a) (i) earth wire

1

- (ii) double

1

- (b) if too much current flows through the wire

accept power for current

do not accept electricity for current

accept if more than 20 amps flows through the wire

1

the fuse (overheats and) melts

accept 'blows' for melts

do not accept explodes / breaks / snaps etc

1

breaking the circuit

accept stopping the current flow

1

[5]