

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

(a) £15

allow 1 mark for use of 125 (kWh)

allow 1 mark for an answer 1500

*allow **both** marks for 1500 pence / p*

*allow 1 mark for correct calculation of annual cost for either freezer
(£27 and £42)*

2

(b) £45

or their (a) $\times 3$

allow 1 mark for correct use of 3

allow 1 mark for $12 - 9 = 3$

2

(c) any **two** from:

the marks are for the explanation

yes **plus** explanation

- less electricity / energy needed / used
accept less energy wasted
- less (fossil) fuels burned
accept a named fossil fuel
*do **not** accept conserving (fossil) fuels*
- less polluting gases emitted
accept a named polluting gas / greenhouse gases / carbon emissions /
reduce global warming
accept an answer in terms of nuclear fuel
eg less nuclear fuel required (1)
less nuclear waste (1)

2

or no **plus** explanation


- old freezer must be disposed of
- hazardous chemicals inside freezer
accept CFC gases

- (lot of) energy used in producing new freezer

[6]

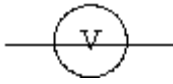
Q2.

- (a) (i) ammeter symbol correct and drawn in series

accept 
do **not** accept lower case a

1

voltmeter symbol correct and drawn in parallel with the material

do **not** accept 

1

- (ii) adjust / use the variable resistor
accept change the resistance

or change the number of cells
accept battery for cell
accept change the p.d / accept change the voltage
accept increase / decrease for change

1

- (b) (i) data is continuous (variable)

1

- (ii) 36 (Ω)
correct answer only

1

- (iii) 5.4 or their (b)(ii) \times 0.15
allow 1 mark for correct substitution

2

- (c) (i) the thicker the putty the lower the resistance
answer must be comparative
accept the converse

1

- (ii) any **one** from:

- measuring length incorrectly
accept may be different length
- measuring current incorrectly
do **not** accept different currents
- measuring voltage incorrectly
do **not** accept different voltage
- ammeter / voltmeter incorrectly calibrated
- thickness of putty not uniform
- meter has a zero error

accept any sensible source of error eg putty at different temperatures
do **not** accept human error without an explanation
do **not** accept pieces of putty not the same unless qualified
do **not** accept amount of putty not same
do **not** accept systematic / random error

1

(iii) repeat readings

accept check results again
accept do experiment again
accept do it again
accept compare own results with other groups
do **not** accept take more readings

1

[10]

Q3.

(a) (i) 4 (V)

allow 1 mark for correct substitution

2

(ii) 5 (V) or (9 – their (a)(i)) correctly calculated

e.c.f

do **not** allow a negative answer

1

(b) (i) thermistor

c.a.o

1

(ii) 0°C to 20°C

1

[5]