Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Particle Model Of Matter (Standard demand)

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) $E = P \times t$

91 (p)

an answer £0.91 gains 3 marks
an answer 0.91 gains 2 marks
*allow **2** marks for energy transferred = 18.2 (kWh)*
or
substitution into 2 equations combined, ie 2.6 × 7 × 5
*allow **1** mark for correct substitution into E = P × t, ie E = 2.6 × 7*
or
*allow **1** mark for multiplying and correctly calculating an incorrect energy transfer value by 5*

3

(b) answers should be in terms of supply exceeding demand

accept there is a surplus / excess of electricity (at night)

1

(c) reduce (rate of) energy transfer (from ceramic bricks)

accept heat for energy
*do **not** accept no energy / heat escapes*
*do **not** accept answers in terms of lost / losing heat if this implies heat is wasted energy*

1

so keeping the (ceramic) bricks hot for longer

accept increase time that energy is transferred to the room
accept keep room warm for longer

or

to stop the casing getting too hot

accept so you do not get burnt (on the casing)

1

(d) $E = m \times c \times \theta$

120

*allow **1** mark for correct substitution*
ie 9 000 000 = m × 750 × 100

2

[8]

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Q2.

(a) (i) conduction

1

(ii) atoms gain (kinetic) energy

accept particles / molecules for atoms

*do **not** accept electrons for atoms*

or

atoms vibrate with a bigger amplitude

accept vibrate faster / more

*do **not** accept start to vibrate*

or

atoms collide with neighbouring atoms

1

transferring energy to (neighbouring / other) atoms

*do **not** accept heat for energy*

or

making these other atoms vibrate with a bigger amplitude

accept faster / more for bigger amplitude

mention of (free) electrons moving and passing on energy negates this mark

1

(b) (i) 5 (°C) to 25 (°C)

either order

1

(ii) a correct example of doubling temperature difference doubling heat transfer

eg going from 5 to 10 (°C) difference doubles heat transfer from 30 to 60 (J/s)

accept for heat transfer number of joules / it

*allow **1** mark for correctly reading 1 set of data eg at 5 °C the heat transfer is 30*

or

for every 5°C increase in temperature difference heat transfer increases by 30 (J/s)

no credit for stating they are directly proportional

2

(iii) 1800

*allow **1** mark for obtaining heat transfer value = 120*

2

(c) payback time calculated as 33 years

calculations must be correct to score the first mark point

explanations must relate to it not being cost effective

1

this is greater than lifetime of windows

or

total savings (over 30 years) = £4800 (1)

this is less than cost of windows (1)

or

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$\frac{5280}{30}$ = 176 (1)

this is more than the yearly savings (1)

1

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