Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) *3rd box*

The negative charge in the water is repelled by the rod and the positive charge is attracted.

1

(b) (i) friction between bottles and conveyor belt / (plastic) guides
accept bottles rub against conveyor belt / (plastic) guides

1

charge transfers between bottles and conveyor belt / (plastic) guides
accept specific reference
eg electrons move onto / off the bottles
reference to positive electrons / protons negates this mark

1

(ii) an atom that has lost / gained electron(s)
*do **not** accept a charged particle*

1

(iii) charge will not (easily) flow off the conveyor belt
accept the conveyor belt / bottle is an insulator / not a conductor
accept conveyor belt is rubber

1

[5]

Q2.

(a) brown

1

(b) outside / case is plastic / an insulator
accept is double insulated
accept non-conductor for plastic
*do **not** accept it / hairdryer is plastic*

1

(c) (i) (1) S_1
and no other

1

(2) S_1 and S_3
both required, either order

1

(ii) S_1 must be ON (for either heater to work)

*do **not** accept reference to 'fan' switch*

1

S_1 switches the fan on

1

(d) 1495

*allow **1** mark for correct substitution*
ie, 6.5 × 230

2

watt(s) or W

*an answer of 1.495 kW gains **3** marks*
although the unit is an independent mark for full credit
the unit and numerical value must be consistent
accept joules per second or J/s

1

[9]

Q3.

(a) transferred to surroundings / surrounding molecules / atmosphere

'it escapes' is insufficient

or

becomes dissipated / spread out

accept warms the surroundings
accept degraded / diluted
accept a correct description for
surroundings eg to the washing machine
*do **not** accept transformed into heat on its own*

1

(b) a smaller <u>proportion / percentage</u> of the energy supplied is wasted

owtte
*accept a statement such as 'less energy is wasted' for **1** mark*
*do **not** accept costs less to run*
ignore references to uses less energy

2

(c) (i) 2.4 (p)

accept 2 p if it is clear from the working out this is rounded from 2.4 p
*allow **1** mark for correct substitution of correct values*
ie 0.2 × 12
*allow **1** mark for calculating cost at 40 °C (13.2 p)*
or
cost at 30 °C (10.8 p)

2

(ii) any **one** from:

- less electricity needed

ignore answers in terms of the washing machine releasing less energy

an answer in terms of the washing machine releasing CO_2 negates the mark
*do **not** accept less energy is produced*

- fewer power stations needed

- less fuel is <u>burned</u>
accept a correctly named fuel
*do **not** accept less fuel is needed*

1

[6]