**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 to the rod.

**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) (the atom) loses or gains one (or more) electrons

**1**

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

**1**

**[5]**

## Q2.

(a) (i) kinetic
*do **not** accept movement*

**1**

(ii) thermal sound
*accept heat for thermal*
*do **not** accept noise for sound*
***both** answers required in either order*

**1**

(b) 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*

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*machine*
*do **not** accept transformed into heat on its own*

**1**

(c) (i) 3 (.0 p)

*allow **1** mark for correct substitution of correct values ie 0.2 x 15*
*allow **1** mark for calculating cost at 40°C (16.5p)*
***or***
*cost at 30°C (13.5p)*

**2**

(ii) any **two** 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 mark*
*do **not** accept less energy is produced*

- fewer power stations needed

- less fuel is burned

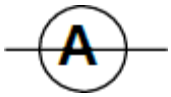
*accept a correctly named fuel*
*do **not** accept less fuel is needed*

**2**

**[7]**

## Q3.

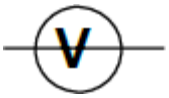
(a) (i) ammeter symbol correct and drawn in series

*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 pd / accept change the voltage*
*accept increase / decrease for change*

**1**

(b) (i) 37.5 (Ω)

*accept answer between 36 and 39 inclusive*

**1**

(ii) 5.6(25) **or** their (b)(i) × 0.15

*allow **1** mark for correct substitution ie 37.5 **or** their (b)(i) × 0.15*

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*provided no subsequent step shown*

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

**1**

**[8]**

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