Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) other energy resources = 95 (%)

1

hydroelectric = 5 (%)

1

(b) $E_p = 2\,500\,000 \times 9.8 \times 15$

1

$E_p = 367\,500\,000$ (J)
or
$E_p = 3.675 \times 10^8$ (J)
allow 370 000 000 (J)
or
$E_p = 3.7 \times 10^8$ (J)

1

(c) energy = power × time
or
$E = P \times t$

1

(d) $t = 3600$ (s)

1

$E = 3000 \times 3600$
allow a correct substitution using an incorrectly/not converted value for t

1

$E = 10\,800\,000$ (J)
or
$E = 1.08 \times 10^7$ (J)
allow an answer consistent with their incorrectly/not converted value for t
allow a correct answer given to 2 s.f.

1

(e) the level of the water in the river varies
or
the amount of rainfall varies

1

and is lower in the summer months

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allow specified months or range of months eg April to September

1

MP2 dependent on scoring MP1

[10]

Q2.

(a) using the funnel was a safety precaution

1

(b) bottle **A** was the control

1

(c) stopclock / stopwatch

allow clock / watch ignore timer

1

(d) **Level 2:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.

3-4

Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

1-2

No relevant content

0

Indicative content

- use the same (start) temperature for each experiment
- use the same number of layers of insulation
  or
  use the same thickness of insulation
- so that temperature difference can be compared

- use the same volume of water
- so (total thermal) energy of water is the same (each time)
  or
  so the same area of the bottle surface is heated by the water

- use a lid for each bottle
- so evaporation is reduced / stopped
  or
  so energy loss from the water (surface) is reduced / stopped

- repeat the investigation and calculate mean values
- so anomalous results can be identified
  or
  so the effect of random errors is reduced

(e) bar (chart / graph)

1

(type of) insulation is not numerical values

allow one variable is not numerical values

allow one variable is not continuous

allow (type of) insulation is not continuous

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or

(type of) insulation is labels / categories

allow one variable is labels / categories

allow one variable is categoric allow (type of) insulation is categoric

1

MP2 dependent on scoring MP1

[9]

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