**Name of the Student**:_____
**Max. Marks : 22 Marks** **Time : 22 Minutes**

Mark Schemes

## Q1.

(a) 0.1 (°C)

**1**

(b) power = energy transferred / time

*allow P = E / t*

**1**

*allow E = P × t*

(c) 1050 / 300

**1**

3.5 (W)

**1**

*accept 3.5 (W) with no working shown for **2** marks*

(d) 1050 = m × 4200 × 0.6

**1**

m = 1050 / (4200 × 0.6)

**1**

m = 0.417 (kg)

**1**

*accept 0.417 (kg) with no working shown for **3** marks*

(e) any **one** from:

- energy used to heat metal pan (as well as the water)
- energy transfer to the surroundings (through the insulation)
- angle of solar radiation will have changed during investigation
- intensity of solar radiation may have varied during investigation

**1**

**[8]**

## Q2.

(a) weight (lifted)

**or**

height (lifted)

**1**

(b) any **two** from:

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- calculate a mean
- spot anomalies
- reduce the effect of random errors

**2**

(c) as speed increases, the efficiency increases

**1**

(but) graph tends towards a constant value

**or**

appears to reach a limit

*accept efficiency cannot be greater than 100%*

**1**

(d) heating the surroundings

**1**

(e) 0 (%)

**1**

**[7]**

## Q3.

(a) any **one** from:

- high cost of installing overhead power lines or underground cables or pylons
- high cost as (very) long cables needed
- amount of electricity required is too low

*allow not enough (surplus) electricity would be generated*

**1**

(b) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should apply a 'best-fit' approach to the marking.

**Level 3 (5 – 6 marks):**
clear comparison of advantages **and** disadvantages of **each** method

**Level 2 (3 – 4 marks):**
at least **one** advantage **and one** disadvantage is stated for **one** method **and** a different advantage **or** disadvantage is stated for the other method

**Level 1 (1 – 2 marks):**
at least **one** advantage **or one** disadvantage of either method

**Level 0 (0 marks):**
No relevant information

**examples of physics points made in the response**

**Advantages of both methods:**

- both renewable sources of energy
- both have no fuel (cost)
- both have very small (allow 'no') running costs
- no carbon dioxide produced

*accept carbon neutral*

*accept no greenhouse gases*

*accept doesn't contribute to global warming*

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**Advantages of wind:**
- higher average power output

*produces more energy is insufficient*

**Advantages of hydroelectric:**
- constant / reliable power (output)
- lower (installation) cost

**Disadvantages of wind:**
- higher (installation) cost
- variable / unreliable power output
- (may) kill birds / bats

**Disadvantages of hydroelectric:**
- lower power output
- (may) kill fish or (may) damage habitats
- more difficult to set up (within river)

**Disadvantages of both methods:**
- (may be) noisy
- visual pollution

*ignore payback time unless no other relevant points made*

*ignore time to build for both*

**6**

**[7]**

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