

Name of the Student: _____

Max. Marks : 25 Marks

Time : 25 Minutes

Mark Schemes

Q1.

- | | | |
|-----|---|---|
| (a) | 0.093 A | 1 |
| (b) | 0.093 A | 1 |
| (c) | (increasing the resistance) decreases the current | 1 |
| | therefore (the lamp will be) dimmer | 1 |
| (d) | potential difference = current $\times$ resistance
<i>accept correct rearrangement with R as subject</i> | 1 |
| (e) | 3.3 = 0.15 $\times$ R | 1 |
| | R = 3.3 / 0.15 (Ω) | 1 |
| | R = 22 (Ω) | 1 |
| | <i>allow 22 (Ω) without working shown for 3 marks</i> | |
| (f) | line drawn from the origin with a decreasing gradient. | 1 |

[9]

Q2.

- | | | |
|-----|---|---|
| (a) | any one from: | |
| | <ul style="list-style-type: none"> 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 | |
| | <i>allow not enough (surplus) electricity would be generated</i> | 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

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:

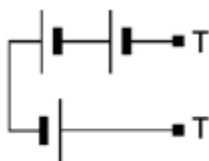
- (may be) noisy
 - visual pollution
- ignore payback time unless no other relevant points made*
ignore time to build for both

6

[7]

Q3.

(a) 3rd box from the left ticked



- (b) correct symbol drawn in series with other components
symbol must have upper case A

1

- (c) (i) $9 + 3 = 12V$
reason only scores if this mark scored

1

pd of battery is shared between the variable resistor and fixed resistor
 accept $V_1 + V_2 = \text{pd of the battery}$
 accept *p.d. is shared in a series circuit*
 accept *voltage for p.d.*

1

- (ii) 600
reason only scores if this mark scored

1

p.d. of supply shared equally when resistors have the same value
or
 ratio of the p.d. is the same as the ratio of the resistance

1

- (iii) 0.015
or
 their (c)(i) $\div$ (their (c)(ii) + 200) correctly calculated
 allow **2** marks for correct substitution ie $12 = I \times 800$
or
 their (c)(i) $= I \times (\text{their (c)(ii)} + 200)$
 allow **1** mark for total resistance = 800 (Ω) or their (c)(ii) + 200
or
 allow **1** mark for a substitution of $12 = I \times 200$
or
 their (c)(i) $= I \times 200$
or
 alternative method using the graph
 $V = 3 V$ (1)
 $3 = I \times 200$ (1)

3

[9]