Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

(a) it can be replenished as it is used

1

(b) biomass – renewable
nuclear – Non-renewable
natural gas – Non-renewable

all 3 correct

Energy resource	Renewable	Non-renewable
Biomass	✓	
Nuclear		✓
Natural gas		✓

allow 1 mark for two correct answers

2

(c) kinetic

answers must be in the correct order

1

chemical

1

(d) less energy is needed to heat the house

1

the roof is a better insulator

1

(e) E = 26 000 × 30

1

780 000 (J)

1

(f) efficiency = $\frac{\text{useful power output}}{\text{total power input}}$

1

(g) 0.15 = $\frac{\text{useful power output}}{26000}$

1

useful power output = 26000 × 0.15

1

useful power output = 3900 (W)

1

(h) sometimes it is not sunny/windy

1

so there's more chance of electricity being generated at any time

OR

more electricity is generated (1)

which reduces the running costs (of the eco-home) (1)

if no other mark scored, allow a reference to reduced greenhouse gas emissions or reduced global warming for 1 mark

1

[15]

Q2.

(a) LED

1

(b) the same as

1

(c)

*an answer of 600 (thousand) or 600 000 scores **2** marks*

*two correct readings from the graph scores **1** mark*

1500 − 900

allow a range of 1480 to 1520 and a range of 880 to 920

1

600 (thousand)

allow an answer in the range of 560 (thousand) to 640 (thousand) consistent with their allowed readings

1

(d) repeat the experiment using exactly the same method

1

(e) power = 0.80 × 0.020

1

power = 0.016 (W)

1

*an answer of 0.016 (W) scores **2** marks*

(f) power = $(\text{current})^2$ × resistance

1

(g) temperature increases

1

(h)

*an answer of 3.6 (C) scores **2** marks*

Q = 0.020 × 180

1

Q = 3.6 (C)

1

[11]