



**Q1.**

Three energy sources used to generate electricity are given in **List A**.  
Statements about the energy sources used to generate electricity are given in **List B**.

Draw **one** line from each energy source in **List A** to the statement about the energy source in **List B**.

<b>List A</b> Energy source	<b>List B</b> Statement about energy source
Geothermal	Uses energy from falling water
Hydroelectric	Uses energy from inside the Earth
Nuclear	Is unpredictable
	Produces dangerous waste

**(Total 3 marks)**

**Q2.**

State and explain the advantages and disadvantages of using nuclear power stations to produce electricity.

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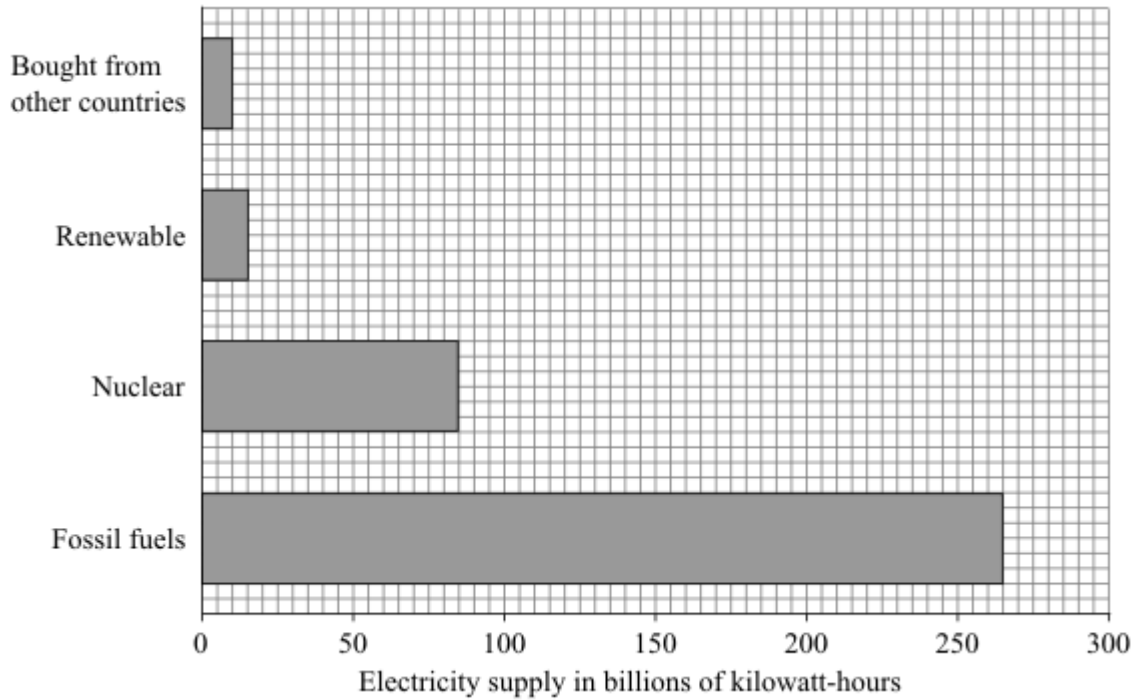
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**(Total 4 marks)**

**Q3.**

The bar chart shows how the UK's electricity demands in 2007 were met.



- (a) What proportion of electricity was generated using renewable energy sources?  
Show clearly how you work out your answer.

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(2)

- (b) By 2020, most of the UK's nuclear reactors and one-third of coal-fired power stations are due to close, yet the demand for electricity is expected to increase.

Four students, **A**, **B**, **C** and **D**, were asked how a demand of 380 billion kilowatt-hours could be met. They made the suggestions given in the table.

Student	Fossil fuels	Nuclear	Renewable	Bought from other countries
<b>A</b>	200	100	40	40
<b>B</b>	80	240	40	20
<b>C</b>	160	80	100	40
<b>D</b>	280	0	100	0

- (i) Which student has made the suggestion most likely to result in the lowest carbon dioxide emissions?

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Give a reason for your answer.

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(2)

- (ii) Suggest **one** realistic way in which a householder could help to reduce the annual electricity demand.

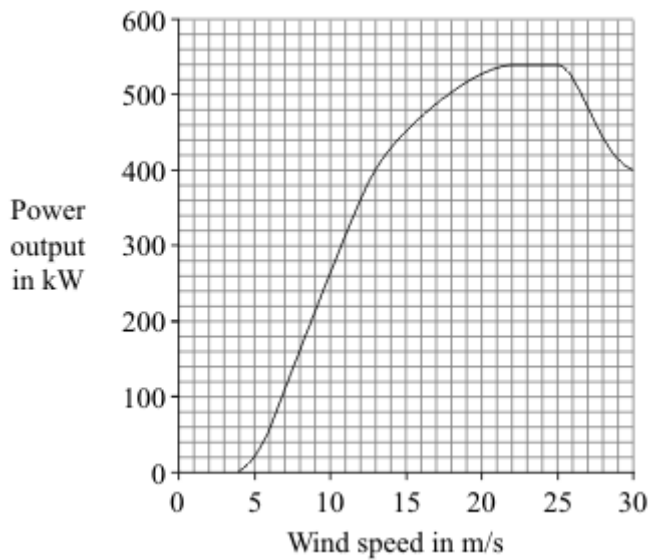
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(1)

- (c) To increase the amount of electricity generated using renewable energy resources would probably involve erecting many new wind turbines.

The graph shows the power curve of a wind turbine.



- (i) Describe, in detail, how the power output of the turbine varies with the wind speed.

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(3)

- (ii) Give **one** disadvantage of using wind turbines to generate a high proportion of

the electricity required in the UK.

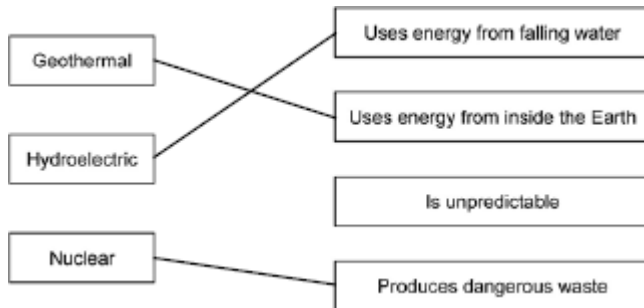
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**(1)**  
**(Total 9 marks)**

Mark schemes

**Q1.**



*allow 1 mark for each correct line  
if more than one line goes from an energy source then all  
lines from that energy source are wrong*

[3]

**Q2.**

Read all the answer first. See below.

**Mark the first two advantages and disadvantages (✓ or X) ignoring**

*neutral answers. Only allow a third advantage if there is only one  
disadvantage given. Only allow a third disadvantage if only one advantage is given.*

max. 3 advantages (e.g. cheap fuel, good availability, saving fossil fuels,  
low running costs, reliable, more energy / kg, less fuel needed, no  
greenhouse gases emitted, no SO<sub>2</sub> causing acid rain)

max. 3 disadvantages (e.g. danger to health of local community, non  
renewable, high cost of decommissioning, long half life of waste  
materials, need for safe storage of waste, high cost of commissioning,  
danger involved in transporting fuel / waste)

*max. 4 marks*

[4]

**Q3.**

(a) 1/25 or 1:25 or 0.04

*accept 4 % or  $\frac{15}{375}$  or  $\frac{3}{75}$  or 1 in 25 for both marks*

*allow 1 mark for total of 375*

*allow 1 mark for a clearly correct method using a clearly  
incorrect total*

*do **not** accept 1:26*

- (b) (i) **B**  
*do not credit reason if B is not chosen* 1
- (only) burning fossil fuels produces carbon dioxide / carbon (emissions)  
or nuclear fuels don't produce carbon dioxide  
*insufficient – smallest amount of fossil fuels accept less carbon dioxide* 1
- (ii) accept anything reasonable eg  
increased level of insulation  
use energy efficient light bulbs  
do not leave appliances on standby  
switch thermostats down (1°C)  
generate own electricity  
install solar panels  
*accept insulate*  
*accept specific examples eg loft* 1
- (c) (i) any **three** from:
- no power output until wind speed exceeds 4m/s
  - output rises rapidly after 4m/s
  - output begins to level out / rises less rapidly at / after 13m/s
  - output peaks at 21 / 22m/s
  - output constant between 21 / 22 and 25 / 26 m/s
  - output falls (rapidly) after 25 / 26m/s  
*accept for 1 mark goes up then comes down*
- 3
- (ii) any **one** from:
- unreliable energy source
  - dilute energy source
  - take up too much land  
*accept wind does not always blow*  
*accept need thousands / lots of turbines*  
*ignore reference to visual / noise pollution*  
*ignore reference to kill birds*

