



Answer **all** questions in the spaces provided.

- 1 (a) Use words from the box to complete the paragraph below.

<b>natural gas</b>	<b>light</b>	<b>oil</b>	<b>oxygen</b>	<b>pressure</b>
<b>sediment</b>	<b>trees</b>	<b>water</b>		

Coal, ..... and ..... are all fossil fuels. They were formed millions of years ago when dead plants and animals were buried under layers of ..... They were formed deep underground where there was no ..... and they were affected by heat and .....

*(5 marks)*

- (b) The photographs show two different types of coal mining.



**Photograph A**

*Source:* Stuart Tomlins (Shropshire Mines Trust)

Photograph not reproduced here due to third-party copyright constraints.

**Photograph B**

- (i) Name the type of mining shown in each photograph.

**Photograph A**.....

**Photograph B**.....

*(2 marks)*

- (ii) Name and briefly describe **one** environmental impact which could be caused by the type of mining shown in **Photograph A** but not by the type shown in **Photograph B**.

Named impact .....

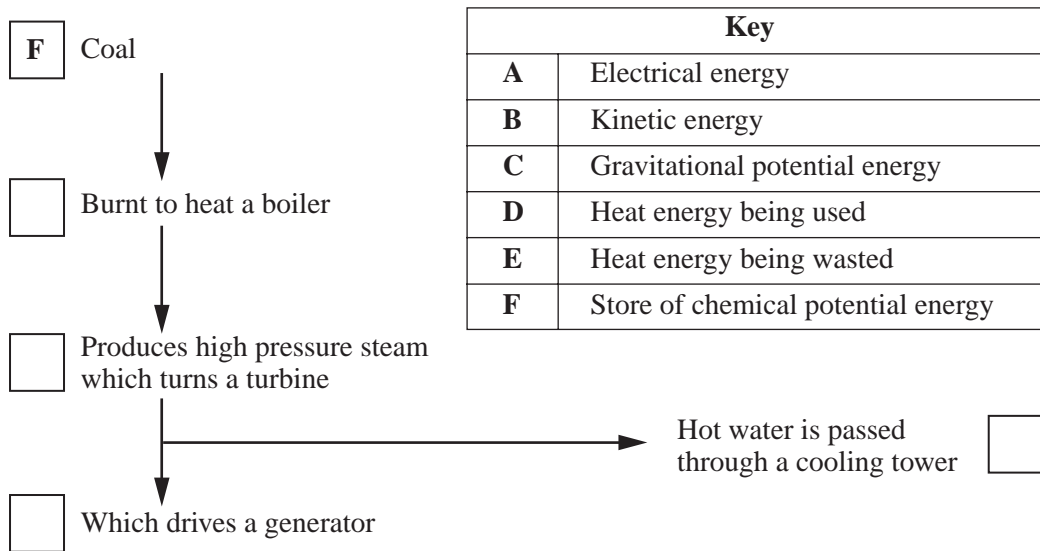
Brief description.....

.....

.....

(2 marks)

- (c) (i) The diagram shows the flow of energy through a coal-fired power station. Complete the diagram by choosing letters from the key and writing them in the correct boxes.



(4 marks)

- (ii) Gases are released into the atmosphere from coal-fired power stations. Name **two** of these gases and give **one** different harmful effect of **each** gas.

Name of gas .....

Harmful effect.....

.....

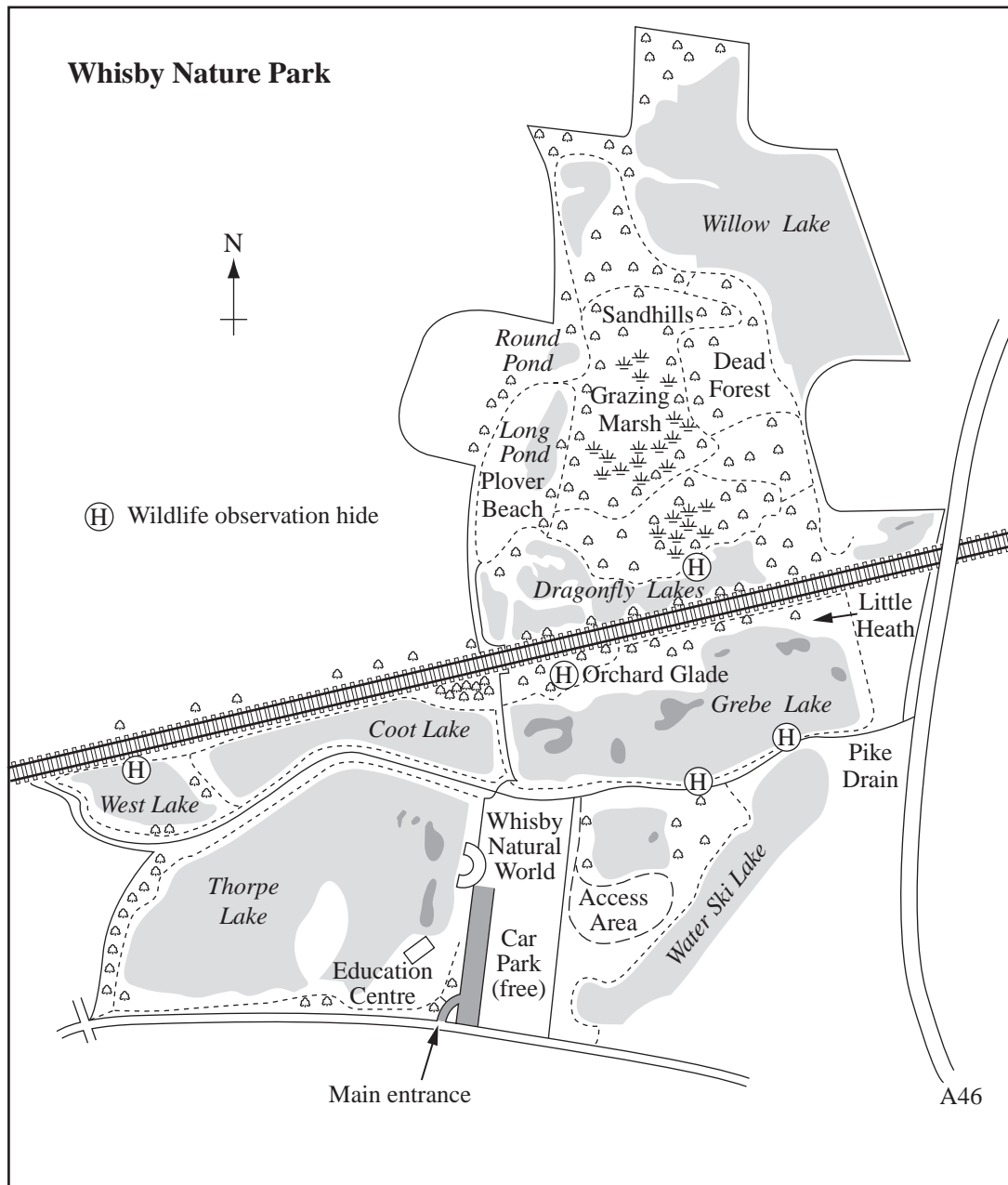
Name of gas .....

Harmful effect.....

.....

(4 marks)

- 2 (a) The map shows Whisby Nature Park in Lincolnshire. The lakes were created by the extraction of sand and gravel.



Source: Lincolnshire Wildlife Trust. [www.lincstrust.org.uk](http://www.lincstrust.org.uk)

- (i) List **two** facilities shown on the map which have been provided for visitors to this site.

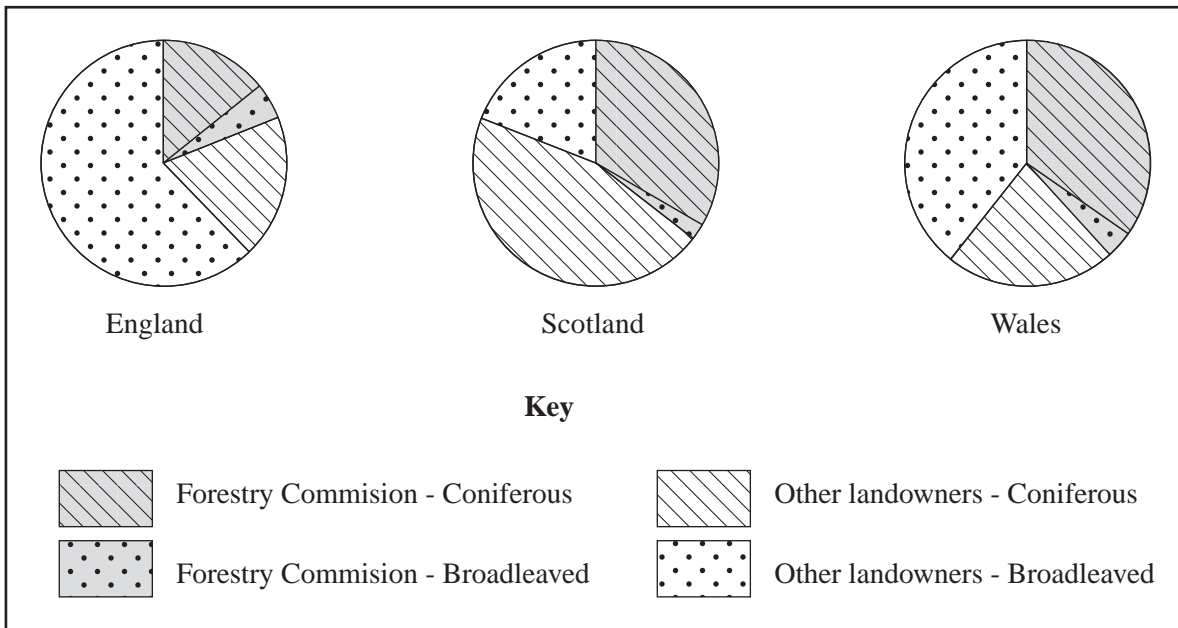
1 .....

2 .....

(2 marks)



- 3 (a) The pie charts show the percentages of coniferous and broadleaved woodland owned by the Forestry Commission and by other landowners in England, Scotland and Wales.



- (i) Which country has the largest percentage of broadleaved woodland?

.....

*(1 mark)*

- (ii) Which country has the largest percentage of coniferous woodland?

.....

*(1 mark)*

- (iii) Which country has the largest percentage of its woodland owned by the Forestry Commission?

.....

*(1 mark)*

(b) The table shows the amounts of wood used for different purposes in the UK in 2002.

Amount of wood used in millions of cubic metres			
Used as wood (in buildings, furniture, etc.)	Manufactured panels (hardboard, fibreboard, etc.)	Paper	Total
18.1	6.7	22.6	47.4

(i) Calculate the percentage of wood used as paper.

..... % (1 mark)

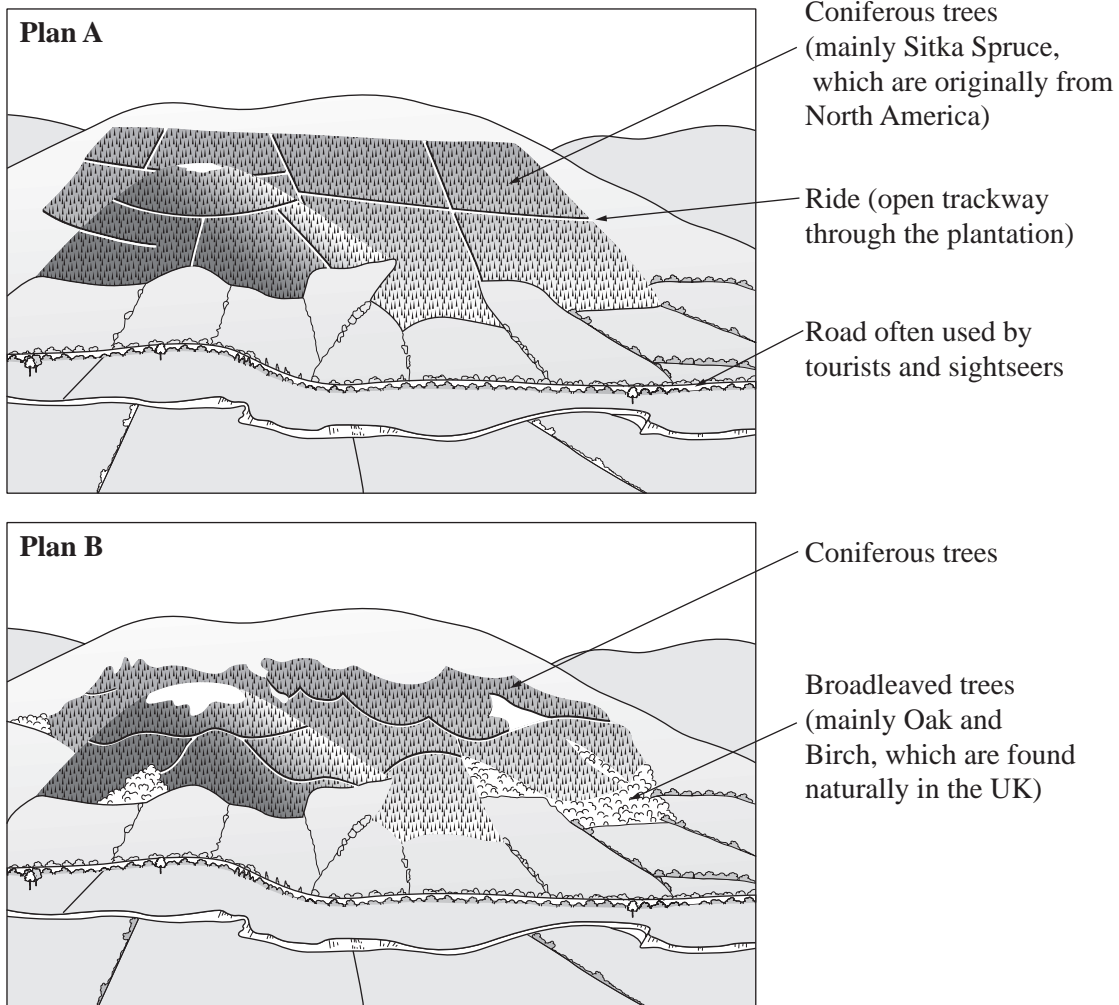
(ii) State **one** way in which the amount of wood used to make paper could be reduced.

.....  
(1 mark)

**QUESTION 3 CONTINUES ON THE NEXT PAGE**

Turn over ►

- (c) The landscape sketches show two different plans for planting a forestry plantation in an upland area in the United Kingdom.



- (i) State **three** differences between the two plans.

1.....

.....

2.....

.....

3.....

.....

(3 marks)



- (ii) State which plan, **A** or **B**, you think would be better for nature conservation. Give **one** reason for your choice.

Plan .....

Reason .....

.....

*(1 mark)*

- (iii) State which plan, **A** or **B**, you think would be more popular with tourists and sightseers visiting the area. Give **one** reason for your choice.

Plan .....

Reason .....

.....

*(1 mark)*

$\frac{10}{10}$

**TURN OVER FOR THE NEXT QUESTION**

**Turn over** ►

4 Ozone is a gas found in the Earth’s atmosphere.

(a) (i) Which **one** of the following statements about ozone is true? Tick the correct box to show your answer.

Ozone is the name of a chemical element.

Ozone is a form of the element oxygen.

Ozone molecules contain four atoms. (1 mark)

(ii) Use words from the box to complete the paragraph below.

**CFC compounds      infrared      lower      oxides of nitrogen**  
**ultraviolet      upper**

Scientists have found that ..... damage the Earth’s ozone layer.

The ozone layer is found in the ..... parts of the Earth’s atmosphere.

It provides important protection against ..... radiation which can cause harm to people and other forms of life. (3 marks)

(b) (i) State **two** ways in which people’s health could be harmed because of damage to the ozone layer.

1.....

2..... (2 marks)

(ii) State **one** reason why some scientists believe that damage to the ozone layer could reduce the world’s supply of food.

.....

..... (1 mark)

(iii) **One** of the following is an international agreement to limit the production and use of chemicals which harm the ozone layer. Tick the correct box to show which one.

Brundtland Commission

Kyoto Treaty

Montreal Protocol

*(1 mark)*

$\frac{\quad}{8}$

**TURN OVER FOR THE NEXT QUESTION**

**Turn over** ►

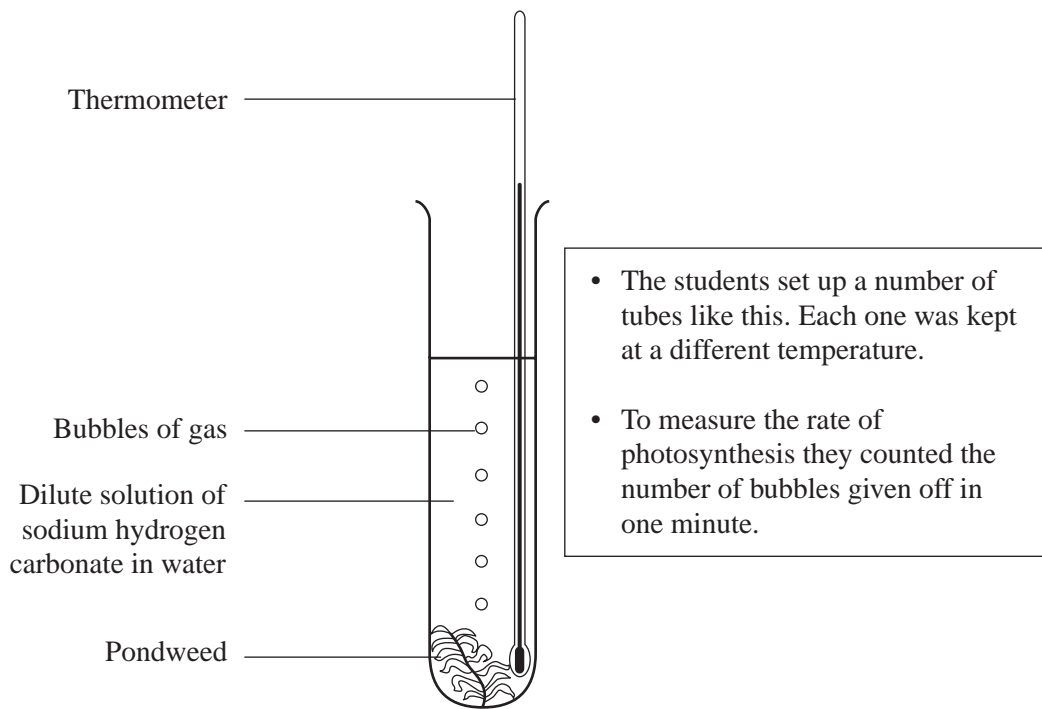
5 (a) Use words from the box to complete the sentences below.

<b>carbon dioxide</b>	<b>chlorophyll</b>	<b>haemoglobin</b>	<b>light</b>
<b>nitrogen</b>	<b>oxygen</b>	<b>water</b>	

- (i) Plants obtain ..... for photosynthesis through their roots.
- (ii) The gas needed for photosynthesis is .....
- (iii) Plants need ..... to provide energy for photosynthesis.
- (iv) The green pigment called ..... captures energy during photosynthesis.
- (v) The gas given off during photosynthesis is .....

(5 marks)

- (b) Some students set out to investigate the rate of photosynthesis at different temperatures. The diagram shows the apparatus they used.



- (i) Suggest **three** things which the students could do to help make their results more reliable.

1.....

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2.....

.....

3.....

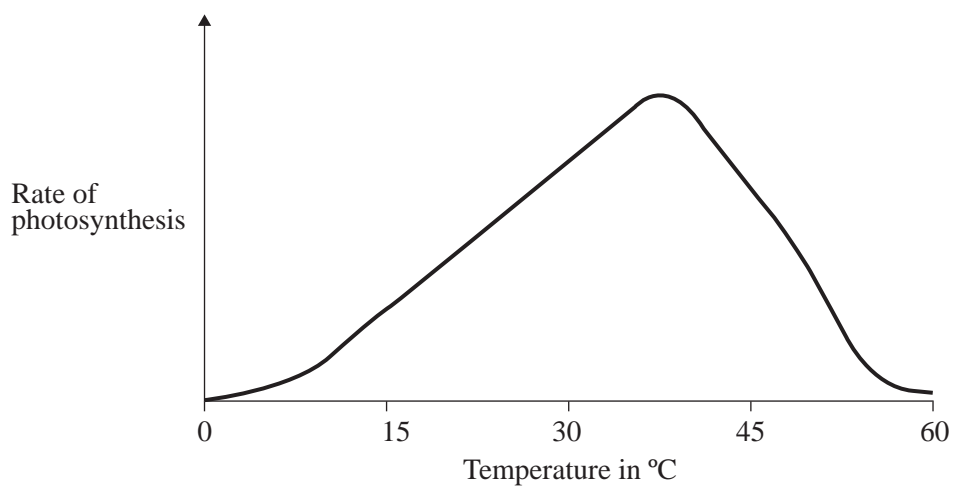
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(3 marks)

QUESTION 5 CONTINUES ON THE NEXT PAGE

Turn over ►

(ii) The diagram shows a sketch graph of the students' results.



1. Use the graph to estimate the temperature at which the maximum rate of photosynthesis happens.

..... °C

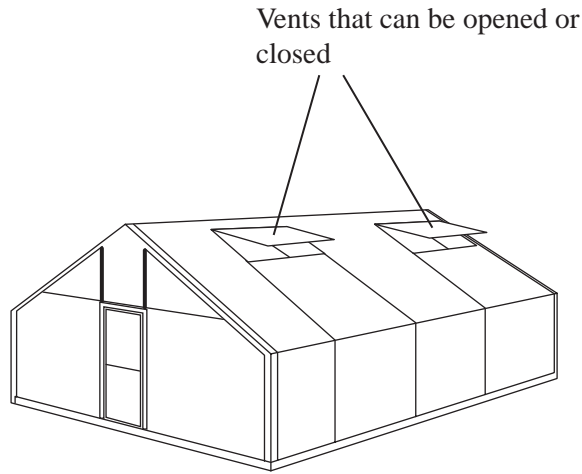
(1 mark)

2. Describe the pattern shown by the graph.

.....  
.....  
.....

(2 marks)

(c) The sketch shows a greenhouse used to grow crops.



Opening or closing the vents can be used to control the temperature in the greenhouse. Explain how this could increase the yield of the crops.

*To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.*

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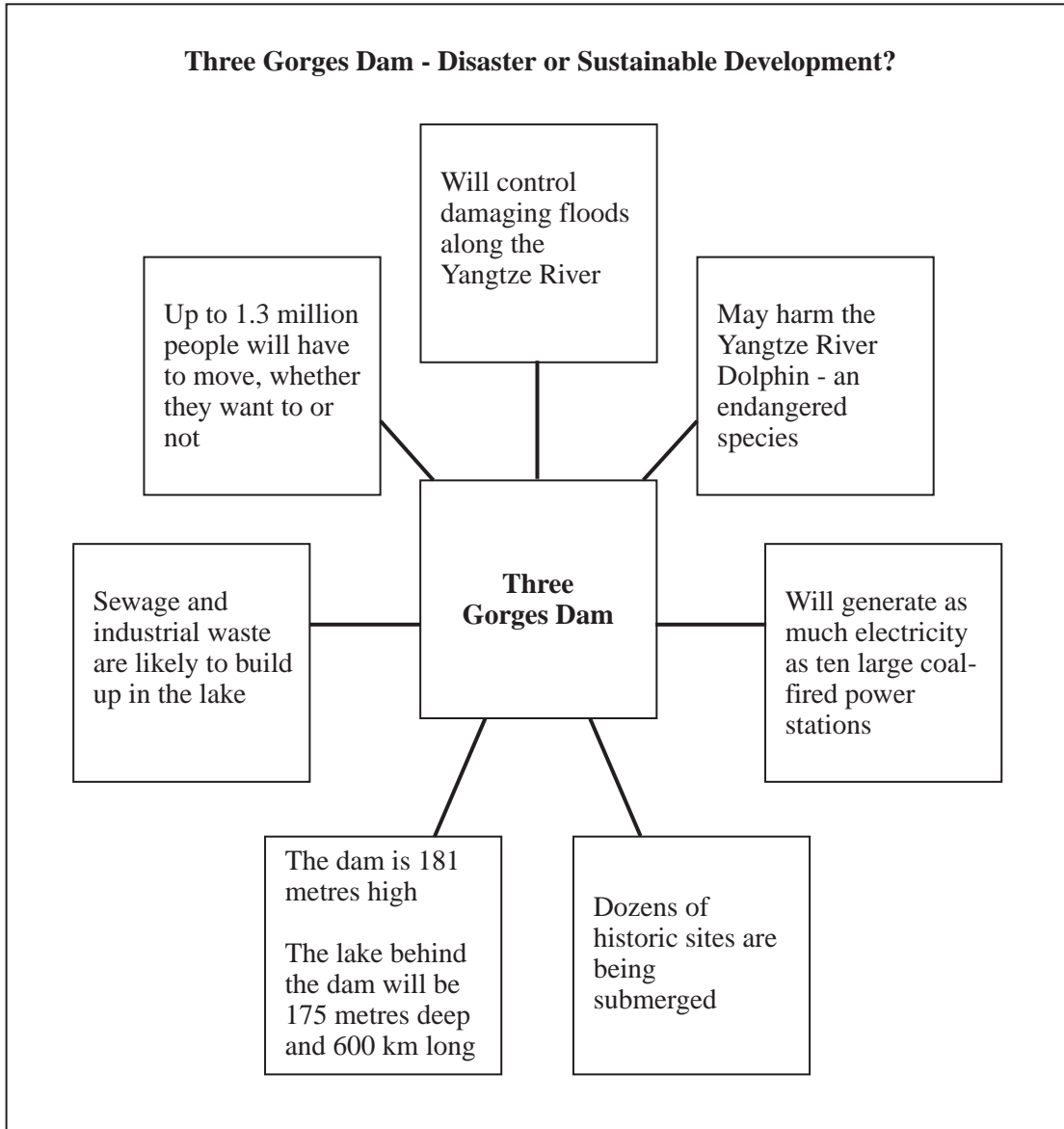
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(4 marks)

**TURN OVER FOR THE NEXT QUESTION**

**Turn over** ►

6 (a) The diagram gives details about the Three Gorges Dam in China.



(i) Using information from the diagram state **three** reasons why some people might think that the Three Gorges Dam will be a disaster.

- 1.....
- .....
- 2.....
- .....
- 3.....
- .....

(3 marks)



(ii) The diagram states that the dam will be used to control floods and generate electricity. Suggest **two** other ways in which the new lake could be used.

1.....  
.....  
2.....  
.....  
(2 marks)

(b) (i) What is meant by the phrase *sustainable development*?

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.....  
(2 marks)

(ii) Explain **one** possible reason why some people think that the Three Gorges Dam is an example of sustainable development.

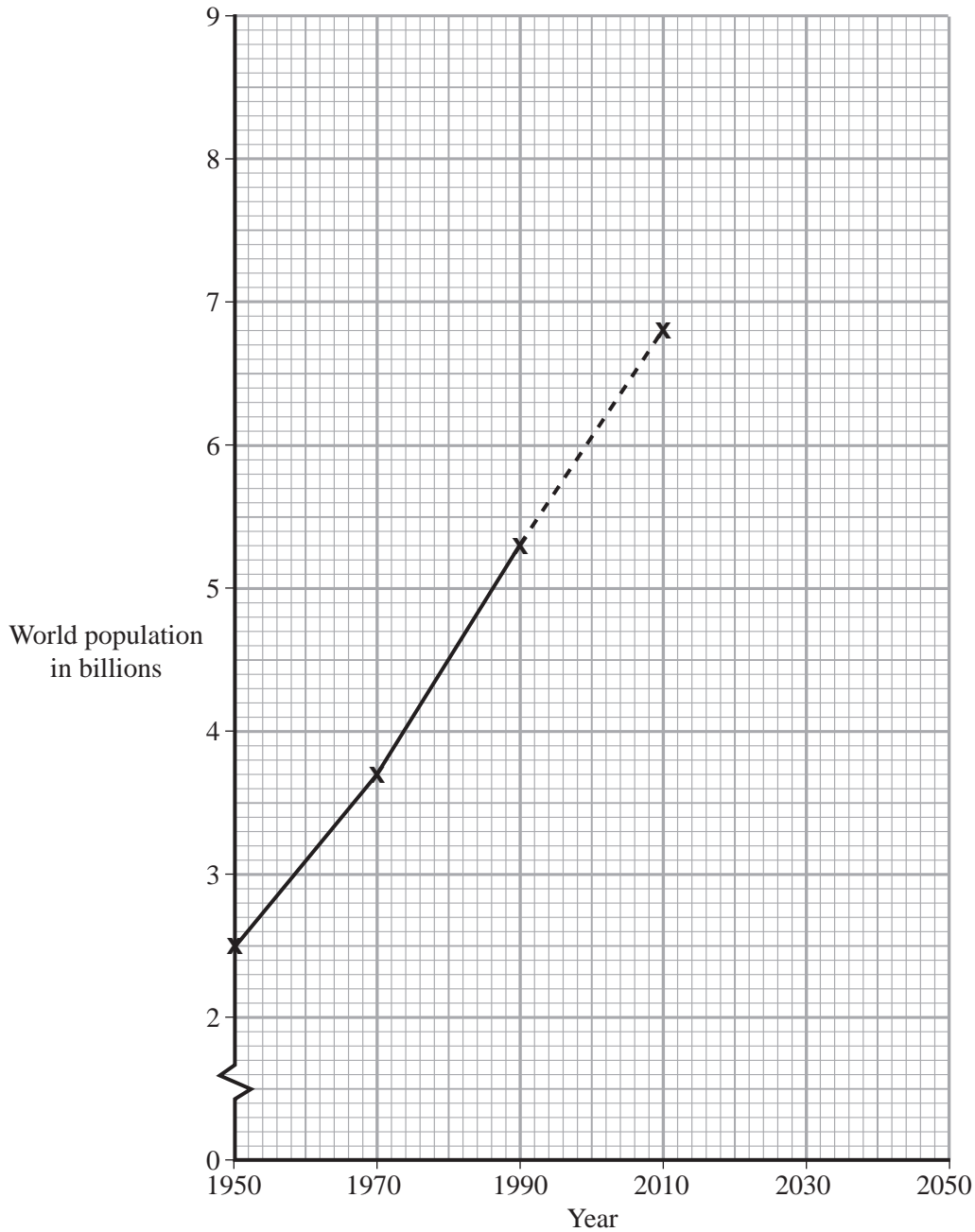
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(2 marks)

(iii) Explain **one** possible reason why some people think that the Three Gorges Dam is **not** an example of sustainable development.

.....  
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.....  
(2 marks)

7 (a) The table gives figures for the total population of the world between 1950 and 2050.

Year	1950	1970	1990	2010	2030	2050
Total population in billions	2.5	3.7	5.3	6.8	8.1	8.9



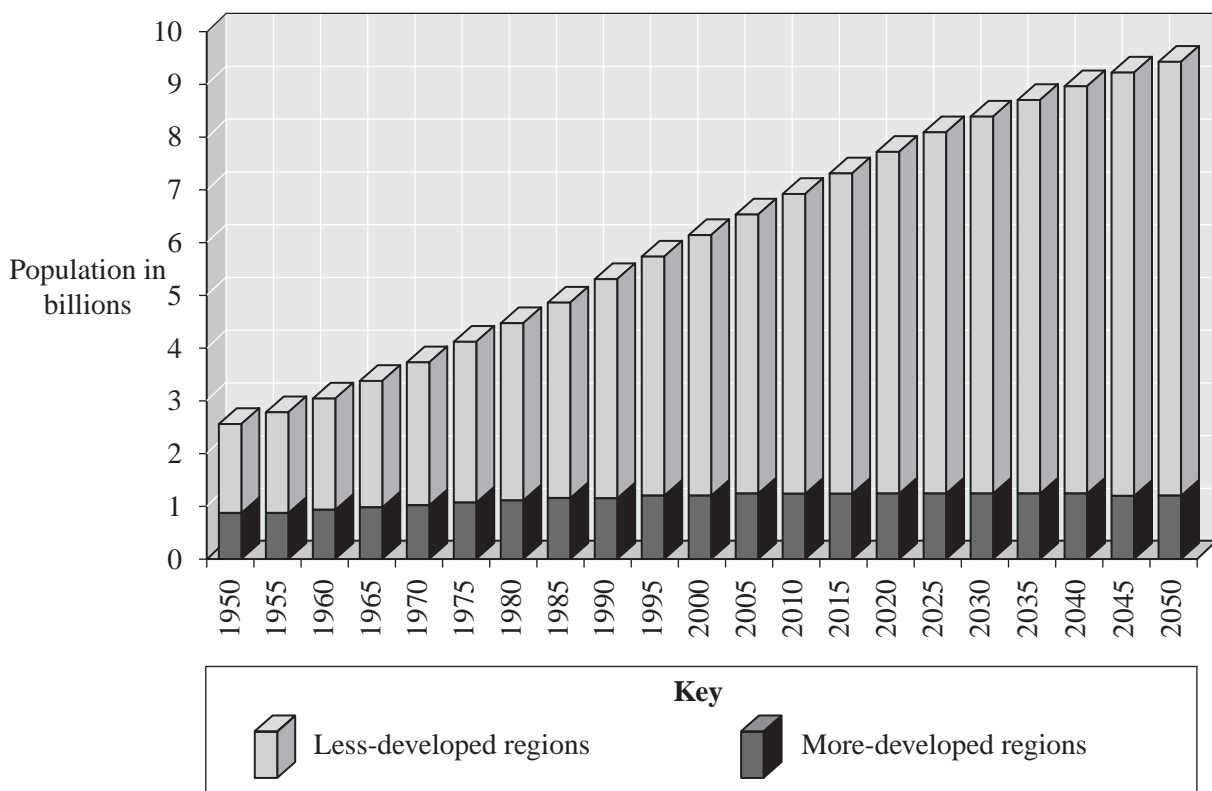
(i) Use figures from the table to complete the graph. (2 marks)

(ii) Use the graph to estimate the year in which the total population of the world reached six billion people.

.....

(1 mark)

(b) The chart shows information about population growth in less economically developed regions and in more economically developed regions of the world. It appeared on a web site about world population.



Source: United Nations

(i) State **two** trends shown by the chart.

1 .....

.....

2 .....

.....

(2 marks)

(ii) People using this chart might have problems getting precise information from it. Suggest **two** problems which they might have.

1 .....

.....

2 .....

.....

(2 marks)

**QUESTION 7 CONTINUES ON THE NEXT PAGE**

**Turn over** ►

- (c) Ethiopia is an economically less-developed country where the population is growing quickly and where many people are often short of food and fuel.

The use of wood and animal manure as fuel adds to the problem of food shortage in Ethiopia.

Explain **one** reason why using **each** of these resources as fuel can add to the problem of food shortage in Ethiopia.

(i) Wood .....

.....

.....

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(2 marks)

(ii) Animal manure (faeces).....

.....

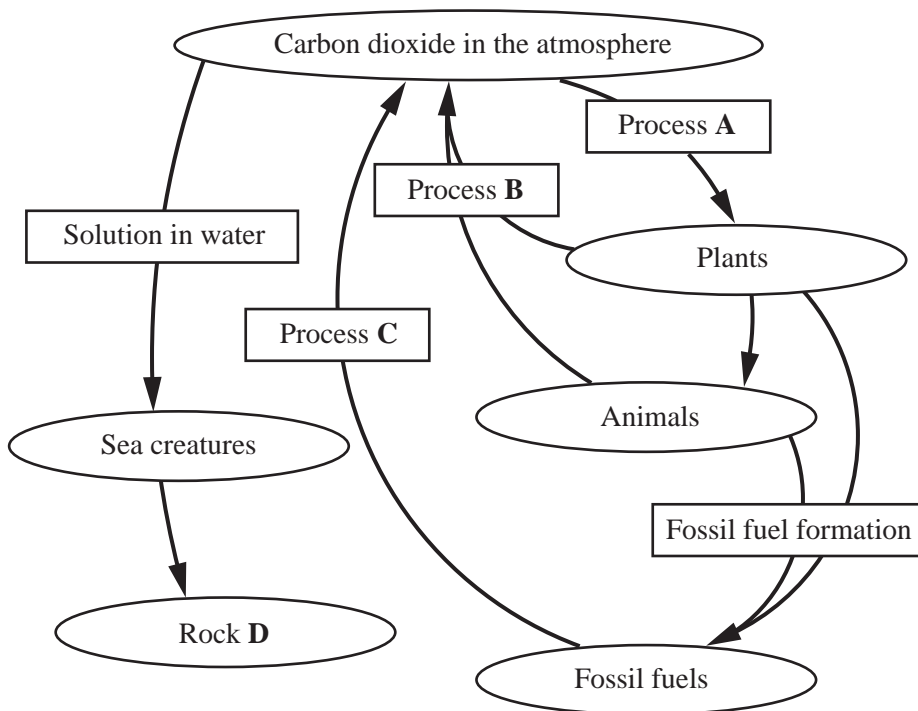
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(2 marks)

11

8 The diagram shows some of the processes involved in the carbon cycle.



(a) (i) Name processes **A**, **B** and **C**.

**A**.....

**B**.....

**C**.....

(3 marks)

(ii) Name rock **D**.....

(1 mark)

(b) (i) Name a combination of **two** processes which could allow carbon dioxide to be taken out of the atmosphere and returned to it within a few days.

..... and .....

(1 mark)

(ii) Name a combination of **two** processes which could lead to carbon being taken out of circulation for millions of years.

..... and .....

(1 mark)

(iii) Describe how animals obtain the carbon which they need.

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(2 marks)

8

**TURN OVER FOR THE NEXT QUESTION**

**Turn over** ►

- 9 (a) The diagrams below show two samples of soil with different textures, one with a large proportion of clay and the other with a large proportion of sand.

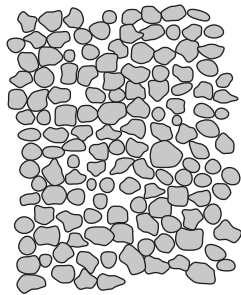


Diagram A

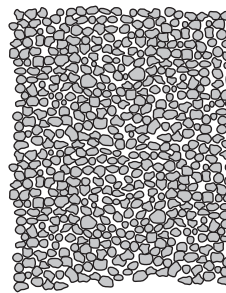


Diagram B

- (i) State which diagram shows the sandy soil and give **one** reason for your choice.

Diagram .....

Reason for choice.....

.....  
(1 mark)

- (ii) Which **one** of the following statements gives the most accurate description of the nutrient content of sandy and clay soils? Tick the correct box.

Sandy soils usually contain more nutrients than clay soils.

There is no difference in the nutrient content of sandy and clay soils.

Clay soils usually contain more nutrients than sandy soils. (1 mark)

- (iii) Soils often need to be cultivated by ploughing or digging. Explain why sandy soils are easier to cultivate than clay soils.

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.....  
.....  
.....

(2 marks)

- (b) Some students were planning to compare the nitrate content of clay and sandy soils. They had been told to use an accurate test kit to measure the nitrate content of their samples.

The extract shows the students' first plan for this investigation and their teacher's comments.

<p><b><u>Method</u></b></p> <ul style="list-style-type: none"> <li>• We will collect a sample of sandy soil from a garden and a sample of clay soil from a field on a farm.</li> <li>• We will use the nitrate test kit from school to measure the nitrate content in each sample.</li> </ul> <p><b><u>Teacher's comments</u></b></p> <p><b>Positive comment</b></p> <ul style="list-style-type: none"> <li>• The test kit will give you accurate measurements.</li> </ul> <p><b>Negative comments</b></p> <ul style="list-style-type: none"> <li>• You need to include more details about your sampling method.</li> <li>• There are at least two reasons why your plan will not provide you with reliable results.</li> </ul>
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- (i) State and give a reason for **one** extra detail which the students should provide about their method of obtaining the soil samples.

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(2 marks)

- (ii) State and explain **two** reasons why the students' plan will not provide reliable results.

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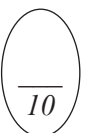
2.....

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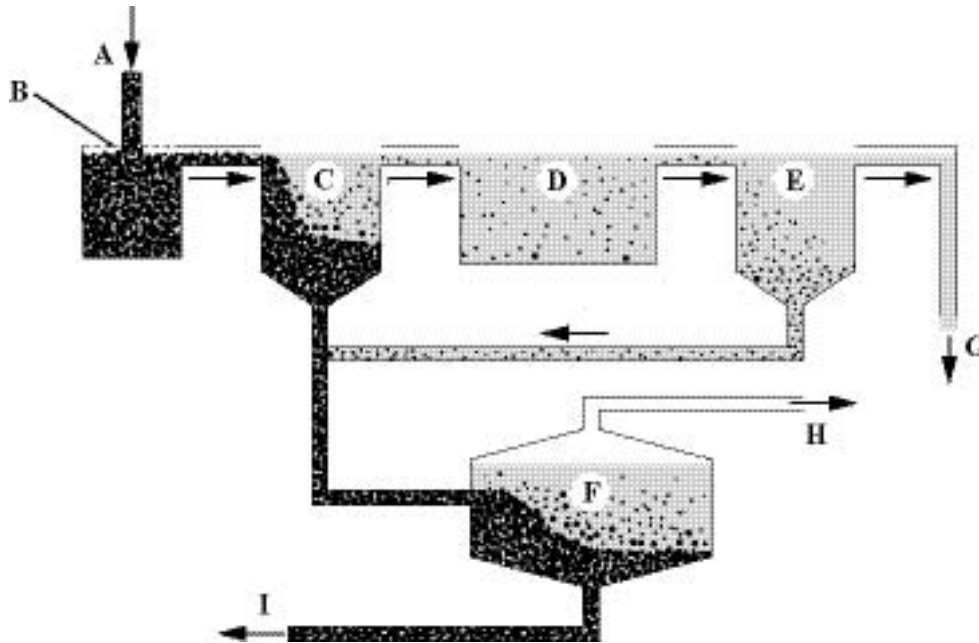
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(4 marks)



Turn over ►

- 10 (a) The diagram shows the processes involved in the treatment of sewage. Untreated sewage enters the treatment works at point **A** and treated sewage is discharged into a river at **G**.



- (i) When the sewage arrives at the treatment works it passes through a moving grid (**B** on the diagram) which removes large objects. Name this process.

..... (1 mark)

- (ii) Tanks **C** and **E** are settlement (or sedimentation) tanks. Describe what happens in these tanks.

.....  
 .....  
 .....  
 .....  
 .....  
 ..... (3 marks)

- (iii) Biological processing of the sewage takes place in tanks **D** and **F**. Explain what is meant by *biological processing*.

.....  
 .....  
 .....  
 .....  
 .....  
 ..... (3 marks)



(iv) Conditions in tank **D** are aerobic, but in tank **F** they are anaerobic. State the difference between aerobic and anaerobic conditions.

.....

..... (1 mark)

(v) The gas produced in tank **F** can be used to produce heat for the sewage works. Name this gas.

..... (1 mark)

(b) Untreated sewage sometimes enters lakes and rivers. Even if the sewage does not contain any toxic substances it can kill fish and other water life. Explain how this can happen.

*To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.*

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(5 marks)

**END OF QUESTIONS**

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