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0680/11

May/June 2016

1 hour 30 minutes

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

You may lose marks if you do not show your working or if you do not use appropriate units.

The number of marks is given in brackets [] at the end of each question or part question.

This document consists of **13** printed pages and **3** blank pages.

- 1 Read the following newspaper report about an earthquake in China.

When an earthquake hit Ludian in Yunnan province on 3 August, 400 people died and 1800 were injured. Many houses collapsed.

The earthquake had a magnitude of 6.1. Another 57 200 residents were made homeless. Ludian has a population of 266 000, many living in structures likely to be damaged by earthquake shaking. Southwest China lies where the Eurasian and Indian plates meet (see map) and has many earthquakes.

Key
 plate movement



- (a) (i) Calculate the percentage of the population of Ludian who were killed, injured or made homeless by the earthquake.

Space for working.

..... % [2]

- (ii) Describe what could be done in the future to reduce the number of 'structures likely to be damaged by earthquake shaking'.

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.....[3]

- (iii) Use the newspaper report to explain why southwest China has many earthquakes.

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.....[3]

- (b) Describe **two** advantages to people of living on or near a plate boundary.

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.....[2]

2 Look at the photograph below.



(a) (i) Complete the table below using letters from the photograph.

[2]

land use	letter
crop farming	
grazing land	
natural vegetation	

(ii) In this area, natural vegetation has been cleared for farming.

State **two** other reasons for clearing natural vegetation.

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.....[2]

(iii) Explain how removal of natural vegetation can lead to desertification.

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.....[4]

(b) Explain how agro-forestry can be used to manage forests sustainably.

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.....[2]

- 3 Look at the photograph below of some ants eating aphids on a thistle plant. Ants will also feed on caterpillars, which themselves feed on thistle plants.



- (a) (i) Draw a diagram showing how energy flows between **all** the organisms named above. [3]

- (ii) State the name of the type of diagram drawn in the space above.

.....[1]

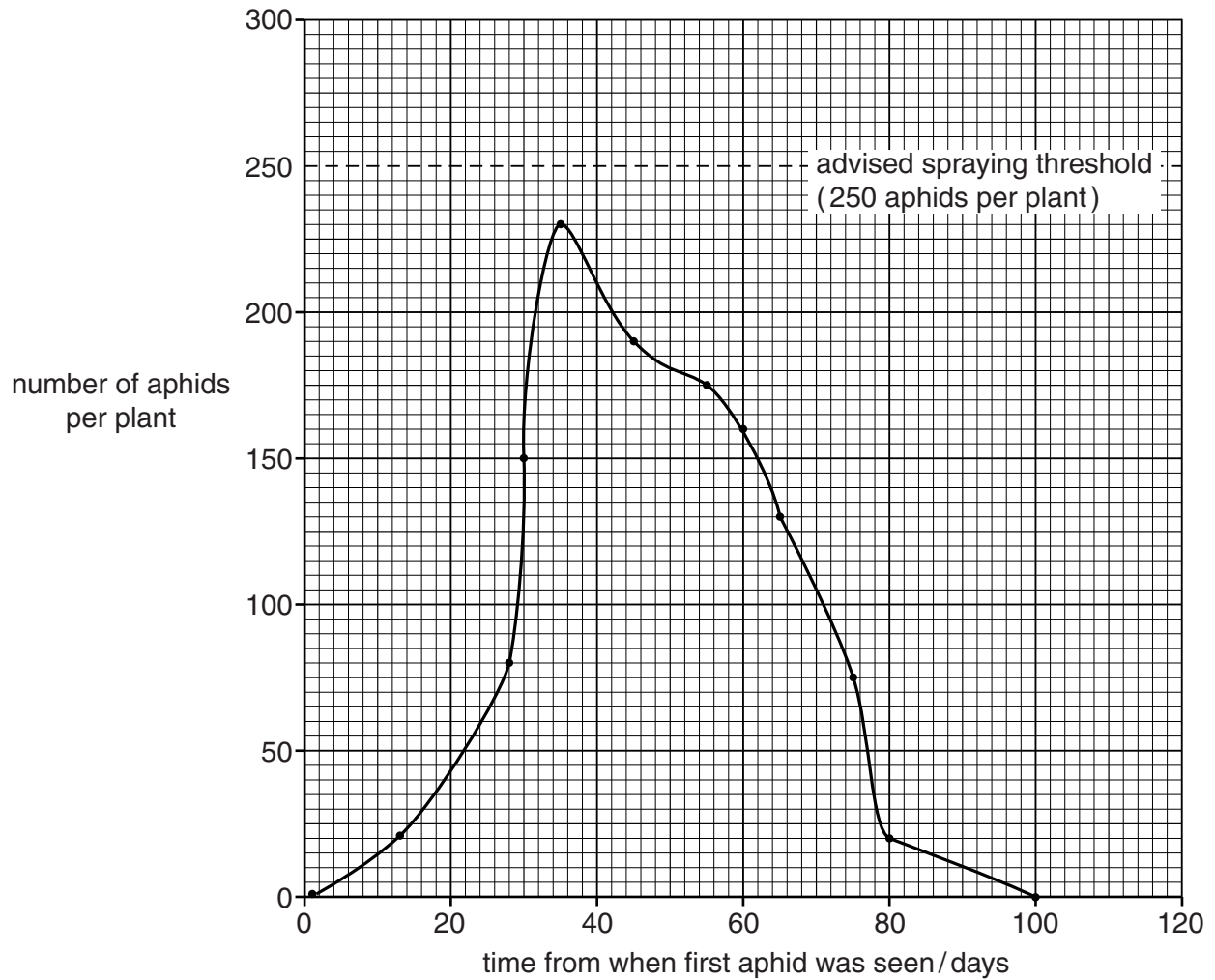
- (b) Aphids are major pests of crops. Their population can be naturally controlled by predators and parasites.

- (i) Explain why some crop farmers may be advised **not** to spray with pesticides when they first see aphids on their crop.

.....

[3]

Look at the graph below, which shows the number of aphids on a soybean crop from the day the first aphid was seen.



- (ii) Describe the changes in aphid population shown on the graph.

.....

[2]

- (iii) Calculate how many aphids per plant fewer than the advised spraying threshold there are 35 days after the first aphid was seen.

Space for working.

..... aphids per plant [1]

4 Only three percent of water on Earth is fresh water.

(a) (i) There are $1\,400\,000\,000\text{ km}^3$ of water on Earth. Calculate how much of this is fresh water.

Space for working.

..... km^3 [1]

(ii) Look at the table below, which shows how this fresh water is distributed.

fresh water type	percentage of all fresh water
ice and snow	87.2
groundwater	12.0
liquid fresh water on the surface	0.8

Calculate the volume of liquid fresh water on the surface.

Space for working.

..... km^3 [2]

(iii) Most fresh water use by humans is for irrigation. Explain how trickle drip irrigation reduces water use by farmers.

.....

[2]

(iv) Explain how too much irrigation water on the surface of soil can cause salination.

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[3]

(b) Explain why there is more water that is safe to drink in urban areas than in rural areas.

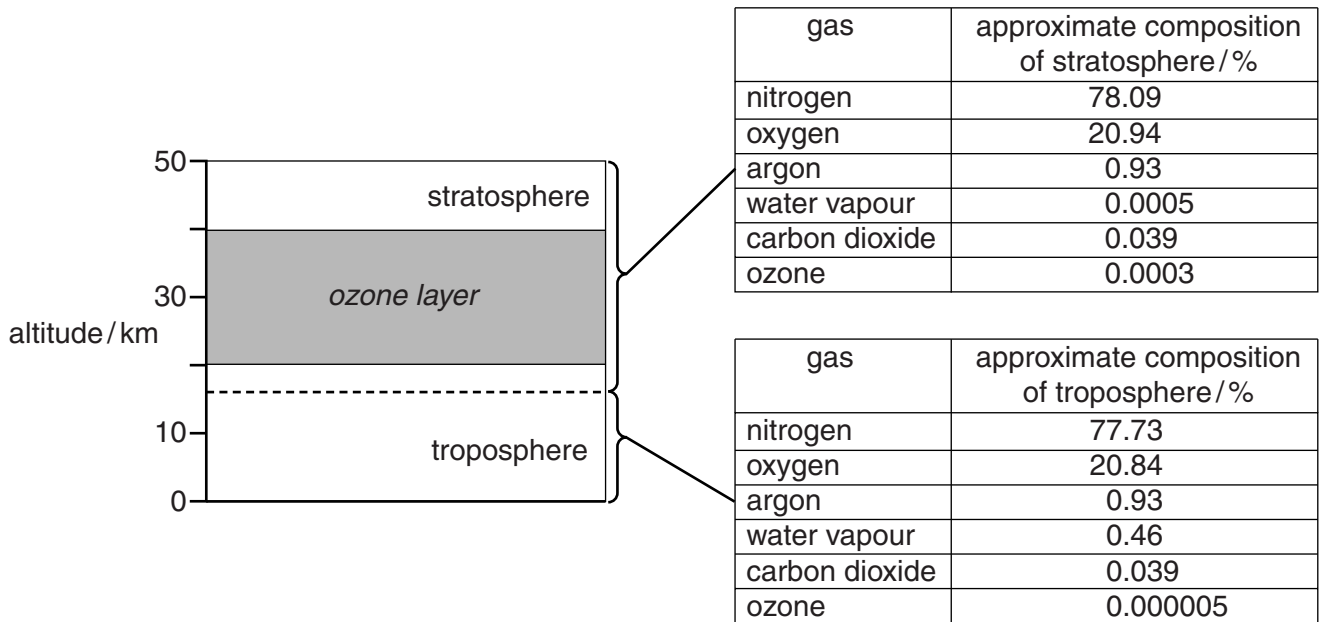
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.....[2]

- 5 The diagram below shows the structure and approximate composition of the Earth's atmosphere up to a height of 50 km.



- (a) (i) State **two** major differences shown in the diagram above, between the composition of the troposphere and the stratosphere.

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.....[2]

- (ii) Explain the importance of ozone to life on Earth.

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.....[2]

- (iii) Deforestation and the use of CFCs affect different layers of the atmosphere.

State the name of the layer affected by deforestation.

Describe the effect of deforestation on the composition of this layer of the atmosphere.

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State the layer affected by the use of CFCs.

Describe the effect of the use of CFCs on the composition of this layer of the atmosphere.

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.....[3]

- (b) Would you be in favour of building more nuclear power stations to reduce the carbon dioxide emissions from burning fossil fuels? Explain your answer.

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.....[3]

- 6 (a) Soil consists of mineral and organic matter, air and water. Explain how soils are formed.

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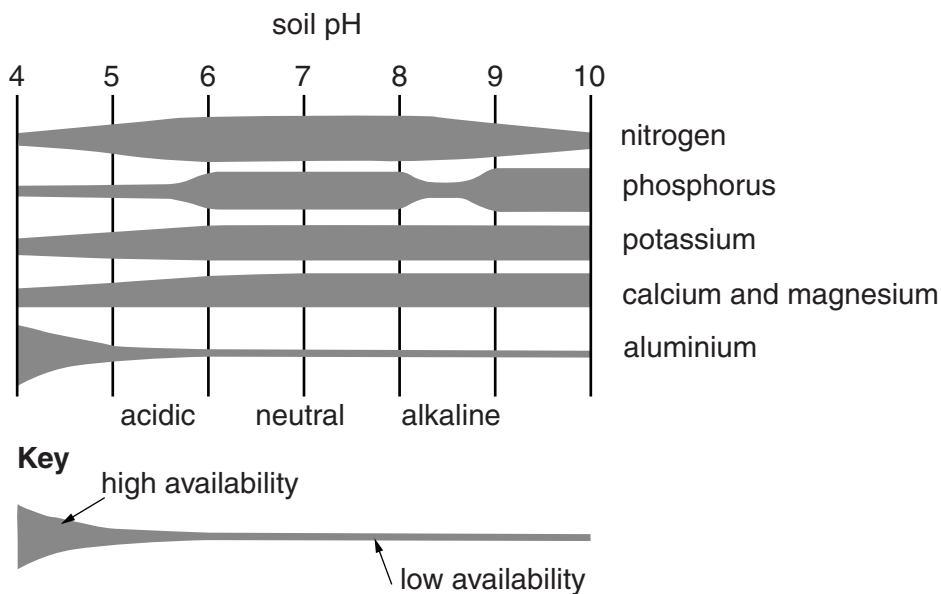
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.....[3]

- (b) Plants get the elements they need from mineral ions in the soil. Look at the chart below, which shows the effect of pH on the availability of elements to a plant.



The plant needs some elements including nitrogen, phosphorus, potassium and magnesium. Aluminium is toxic to the plant.

- (i) Using the information in the chart, circle the range of pH which would be best for the growth of this plant. Explain your answer.

4–6 5–7 6–8 7–9 8–10

explanation

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.....[3]

(ii) Describe **one** problem of acidic soils for crops.

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.....[2]

(c) Explain how human activity can result in an increase in acidic soils.

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.....[2]

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