

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
ENVIRONMENTAL AND LAND-BASED SCIENCE**

B493/02

Management of the Natural Environment
(Higher Tier)

**Wednesday 21 January 2009
Afternoon**

Duration: 45 minutes

Candidates answer on the question paper
A calculator may be used for this paper

OCR Supplied Materials:
None

Other Materials Required:

- Electronic calculator
- Pencil
- Ruler (cm/mm)



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **20** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
		Mark
TOTAL	36	

Answer **all** the questions.

1 Students are going to carry out an investigation into weed killers.

They use the school playing field.



© iStockphoto.com / Stephen Bonk

The students need to work safely.

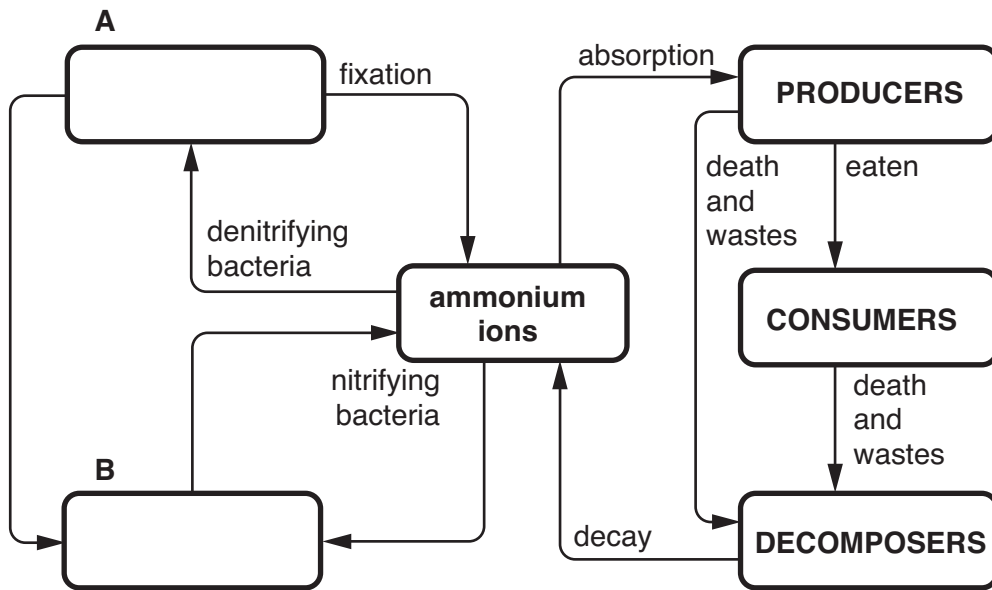
Which **two** of the following instructions should be given to them?

Put ticks (✓) in the boxes next to the correct answers.

- Do not eat while working.
- Do not talk when working.
- Take a pencil to record results.
- Take a watch to tell the time.
- Wash hands before starting work.
- Wash hands after completing work.
- Wear woollen gloves.
- Work in pairs.

[2]

2 The diagram represents the nitrogen cycle.



Complete the boxes **A** and **B** using **two** of the terms below.

carbon dioxide gas

humus

nitrate

nitrogen gas

nodules

protein

[2]

3 A gardener digs over a vegetable plot in the autumn.

Lime is then put on the surface of the soil.

This helps improve the growing conditions.

Complete the following statement using words from the list.

Lime acts to soil acidity and provide for plant growth.

decrease

calcium

increase

potassium

[1]

4 ICT can be used inside glasshouses to continuously monitor the internal environmental conditions.



© Francoise Sauze / Science Photo Library

Which condition is **not** usually monitored in this way?

- A humidity
- B light intensity
- C oxygen
- D temperature

Answer **A, B, C** or **D** [1]

5 The photograph shows a modern tractor.



© iStockphoto.com / Patrick Laverdant

What is the likely effect on the **soil environment** of using large, heavy machinery?

- A increases carbon dioxide levels
- B reduces surface temperatures
- C increases water drainage
- D reduces oxygen levels

Answer **A, B, C** or **D** [1]

6 This table is to compare the features and plants in two woodland ecosystems in the UK.

	features and plants of deciduous woodland	features and plants of coniferous woodland
features		
trees		
shrubs		

Place the **features**, **trees** and **shrubs** from the lists below into the correct woodland.

features

moss and lichens common

grow on clay or loam soil

rich ground flora

grow on poor sandy soils

canopy lets in 20% of light

acidic leaf litter

trees

hazel

oak

pine

spruce

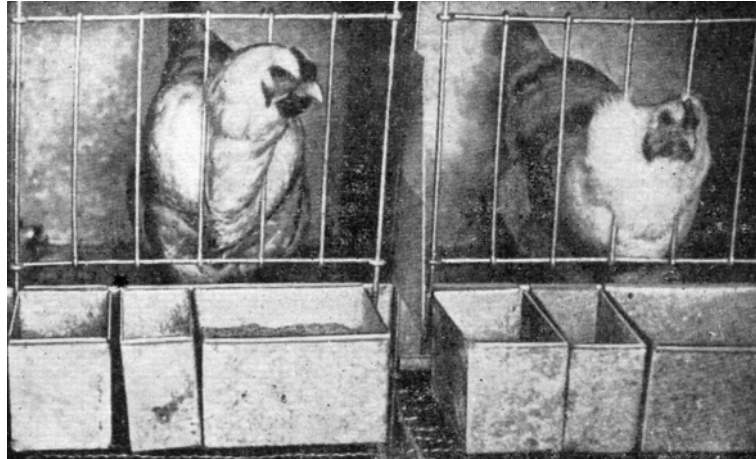
shrubs

blackberry

bilberry

[3]

7 The photograph shows two cages from a battery system used for keeping poultry indoors. The system was designed in the 1930s. It was advertised as providing a warm, disease-free environment. One chicken lived in each cage with plenty of food and water.



© Museum of English Rural Life, University of Reading

(a) State **one** environmental advantage of this system.

.....
..... [1]

(b) This system of poultry keeping was considered an advance 75 years ago.

It is now much criticised and is due to be banned in 2012.

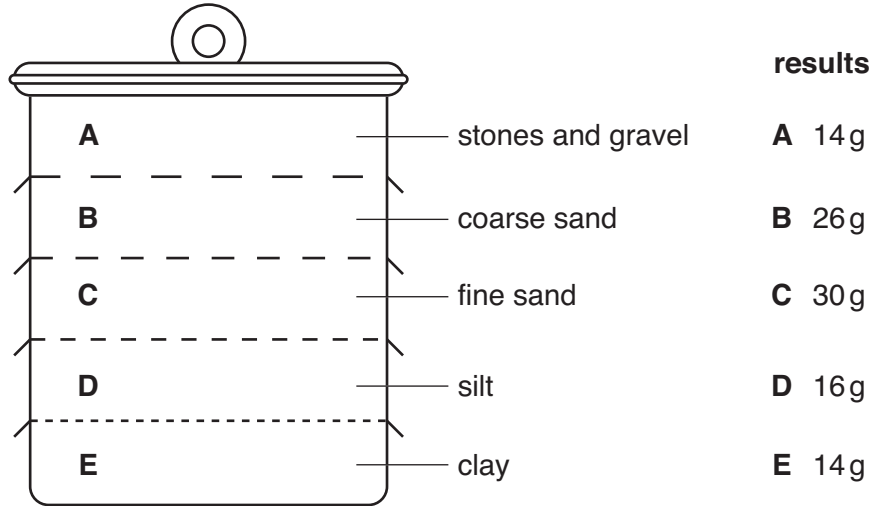
Suggest **one** reason why.

.....
..... [1]

8 Soil sieves are used to separate the parts of a soil sample.

The drawing shows a section through a set of soil sieves.

The results of sieving 100 g of soil sample are given.



(a) Describe the type of soil indicated by this analysis.

..... [1]

(b) State **two** properties of a clay soil.

1

.....

2

..... [2]

9 The photograph shows a sandy habitat.



© Dennis Cox / Alamy

State how a sandy habitat might be affected by strong winds.

.....

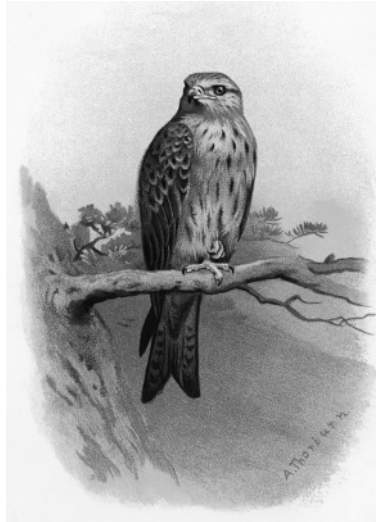
..... [1]

10 Raptors are birds of prey.

Their numbers have increased by over 40% in the last ten years.

This is because

- new laws protect raptors and the environment
- birds like the red kite are being reintroduced.



© Sheila Terry / Science Photo Library

red kite

State how the increase in raptors might affect the pyramid of numbers in the environment.

.....

..... [1]

11 The RSPB has reported a severe drop in numbers of ground nesting birds such as the grey partridge over recent years.

They do not think raptors are to blame for this decrease.

They say global warming, giving warmer winters and spring flooding are more likely causes.



© Dea Picture Library / De Agostini / Getty Images

grey partridge

Use your knowledge of ecosystems to suggest how warmer winters **and** spring flooding might affect the ground nesting birds.

.....

.....

.....

..... [2]

12 The photograph shows some inner city wasteland.

The local council has to make a decision on what to do with the land.

The suggestions are

- allotments
- car park with low cover planted areas
- children's playground
- sports field
- public gardens
- leave it as it is.



© OCR

Which suggestion would produce a landscape with high biodiversity?

Explain the reasons for your choice.

.....

.....

.....

.....

.....

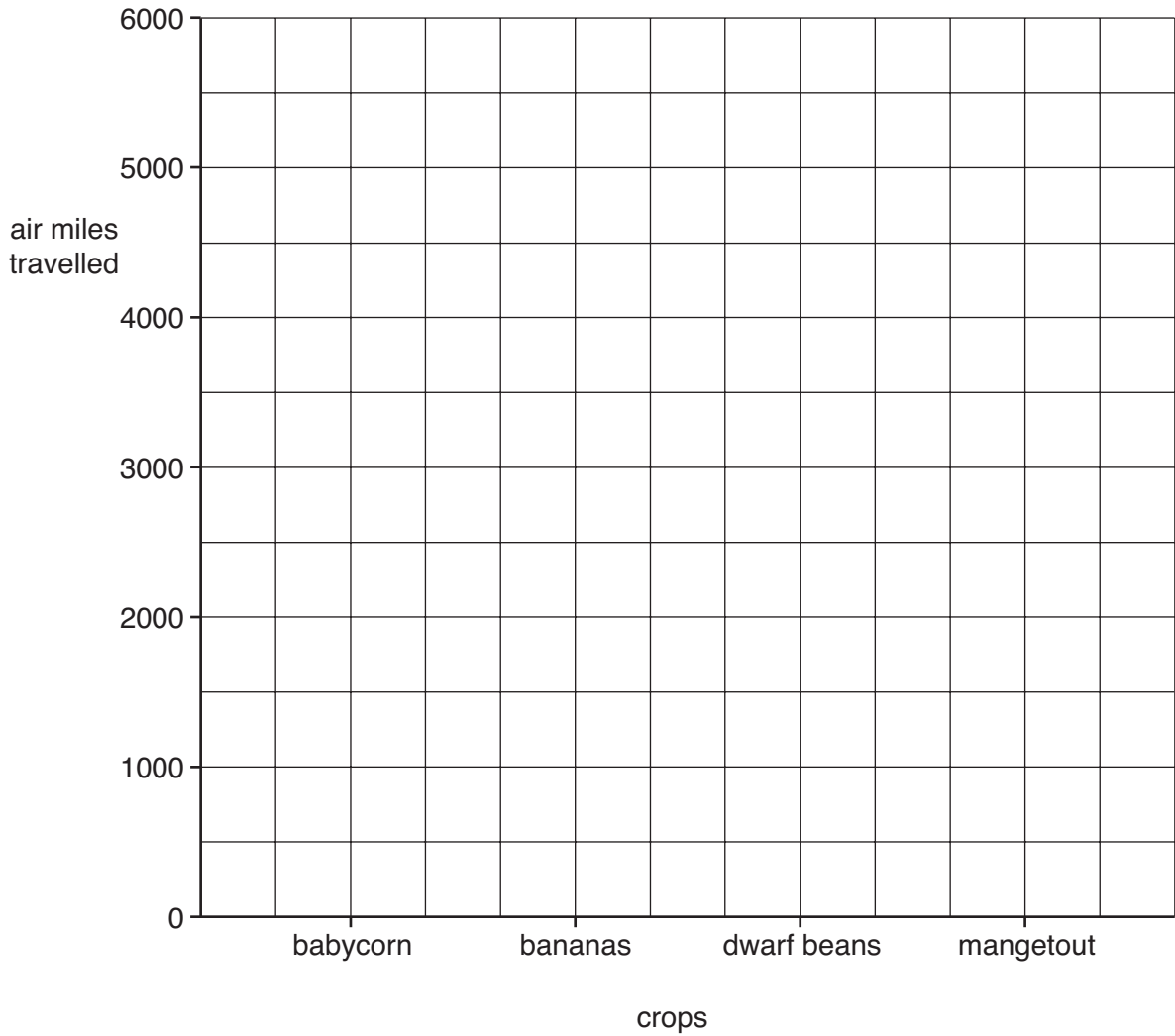
.....

..... [3]

13 The table shows some information about imported organic foods.

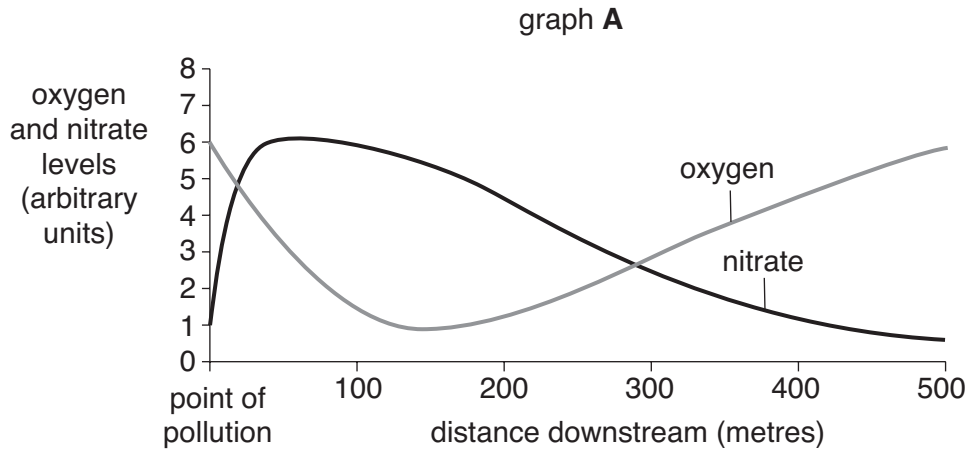
organic food	country of origin	air miles
mangetout	Zambia	4 900
green beans	Egypt	2 200
babycorn	Thailand	5 900
dwarf beans	Kenya	4 000
tomatoes	Spain	1 000
bananas	Jamaica	4 500

Use the information in the table to complete the bar chart.



[2]

14 (a) Graph A shows the effect of nitrate pollution on the oxygen and nitrate levels in a river downstream from the point of pollution.



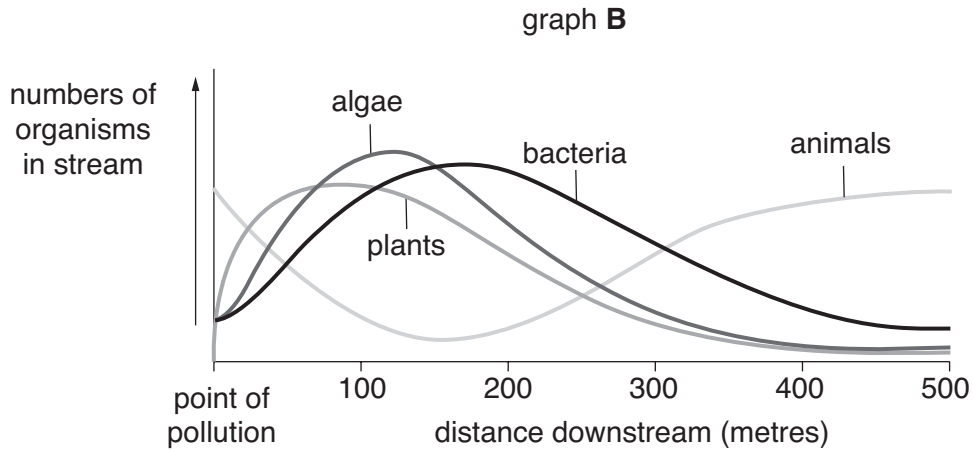
The oxygen concentration changes as the water flows downstream from the point of pollution.

What percentage of the oxygen concentration at the point of pollution exists 50 metres downstream?

- A 10%
- B 30%
- C 50%
- D 60%

Answer **A, B, C** or **D** [1]

- (b) Graph **B** shows the effects of nitrate pollution in a river on the distribution of bacteria, algae, plants and animals downstream from the point of pollution.



Eutrophication is caused by too many nutrients in the river.

At what distance from the point of pollution do eutrophic conditions occur?

between and metres downstream [1]

- (c) The two graphs **A** and **B** show the effects of nitrate pollution in a river.

Graph **A** shows the effect on the oxygen and nitrate levels.

Graph **B** shows the distribution of bacteria, algae, plants and animals downstream from the point of pollution.

- (i) Using the two graphs **A** and **B** describe the relationship between the numbers of plants and the levels of nitrate downstream from the point of pollution.

.....
 [1]

- (ii) Using the two graphs **A** and **B** describe the relationship between the numbers of bacteria and the levels of oxygen downstream from the point of pollution.

.....
 [1]

15 Explain why pollution levels would decrease more rapidly in a fast flowing stream than in a slow flowing stream.

.....
.....
.....
..... [2]

16 85% of Britain’s organic produce is licensed by the Soil Association.



Should organically grown produce that is flown long distances be licensed by the Soil Association?

Give reasons **for** and **against**.

for

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

against

.....
.....
..... [3]

18
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19
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Q16	Soil Association, www.soilassociation.org

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