

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

**B493/02**

Management of the Natural Environment (Higher Tier)

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

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Pencil
- Ruler (cm/mm)

**Monday 25 January 2010  
Afternoon**

**Duration: 45 minutes**



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 **24** pages. Any blank pages are indicated.

Answer **all** the questions.

- 1 The table compares a clay soil with a sandy soil.

	<b>clay soil</b>	<b>sandy soil</b>
<b>cultivation</b>	difficult	easy
<b>drainage</b>		
<b>temperature</b>	warms and cools slowly	warms and cools quickly
<b>water holding</b>		

Complete the table by writing in the terms **good** or **poor** in the correct boxes.

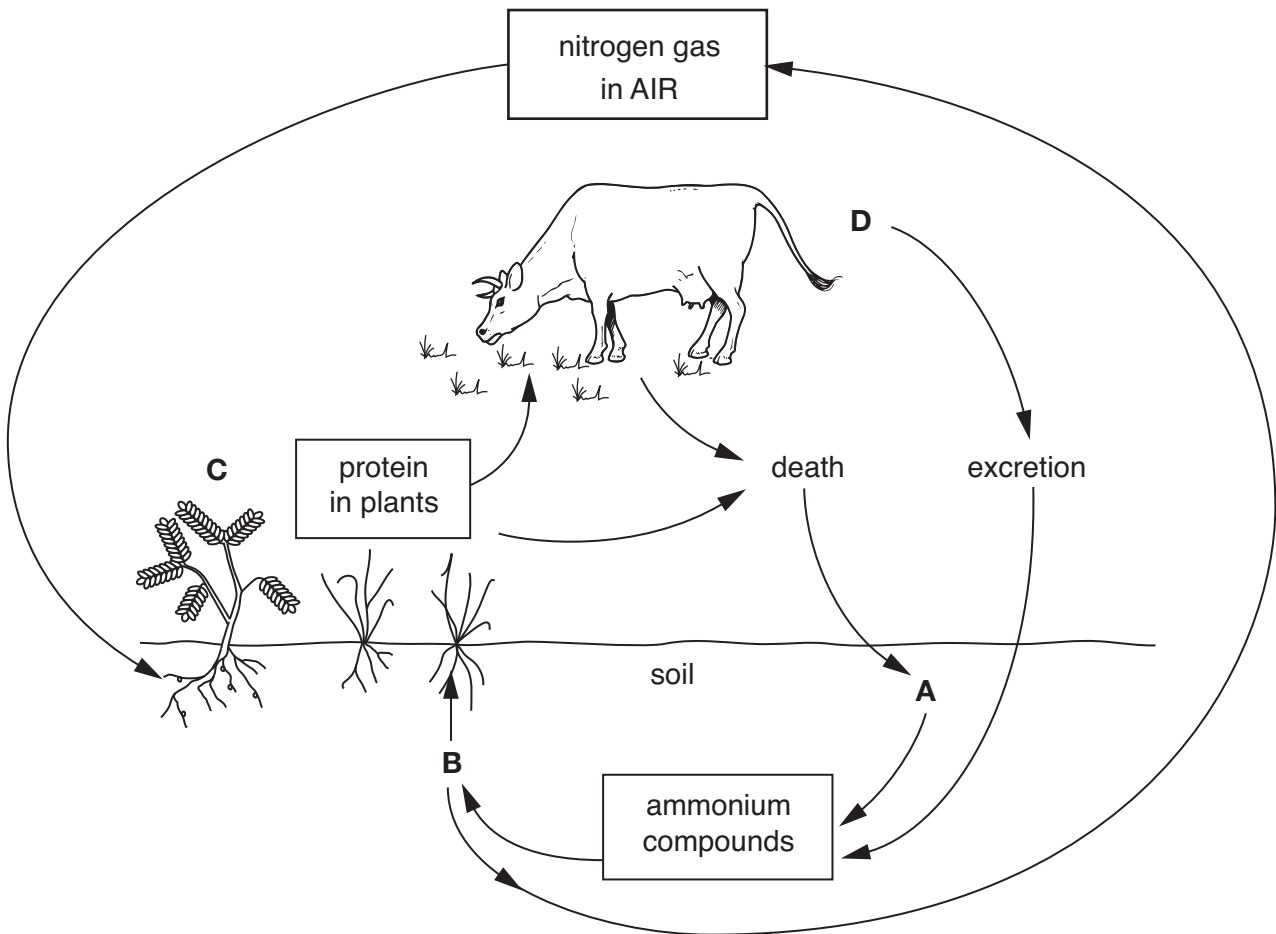
[2]

2 Which one of the following methods of generating useful energy causes the greatest **visual** pollution?

- A crops grown for biofuel
- B roof solar panels
- C tidal booms on the sea
- D wind farm turbines

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

3 The diagram shows part of the nitrogen cycle.

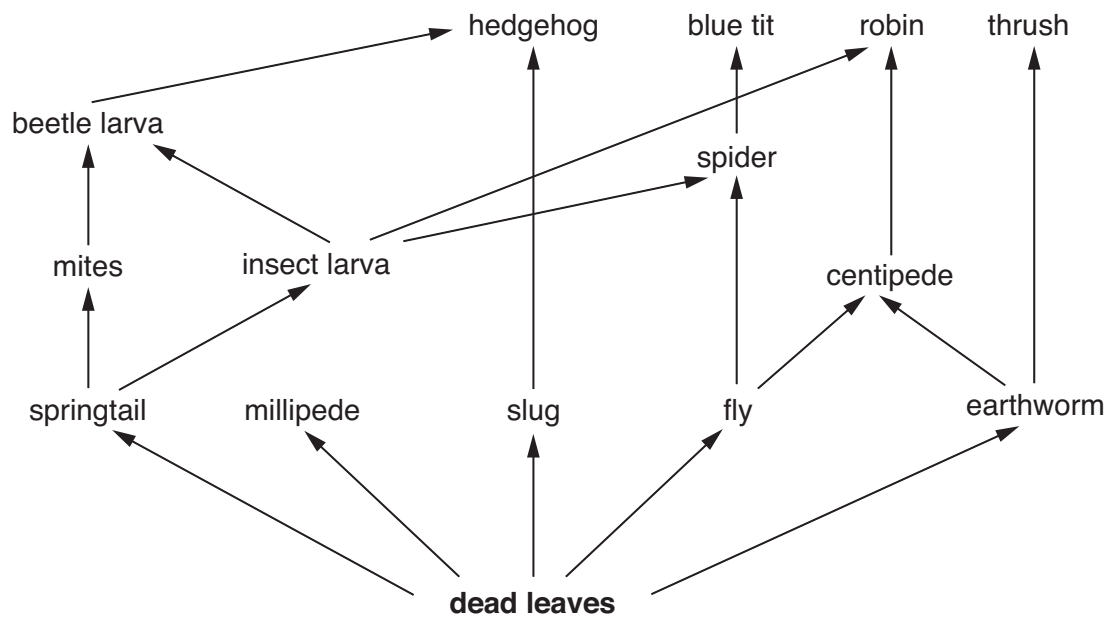


(a) Which letter **A**, **B**, **C** or **D** represents nitrates?

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

(b) Put an **X** onto the diagram of the nitrogen cycle to show where decay takes place. Ensure the **X** can be clearly seen. [1]

4 The feeding relationships of organisms in a garden are shown below.



How many trophic levels are shown in this food web?

- A 2
- B 3
- C 4
- D 5

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

5 Choose the correct word from the list below to complete the following sentence.

The process by which the environment is managed to maintain its natural balances is called

.....

- A conservation
- B cultivation
- C diversification
- D preservation

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

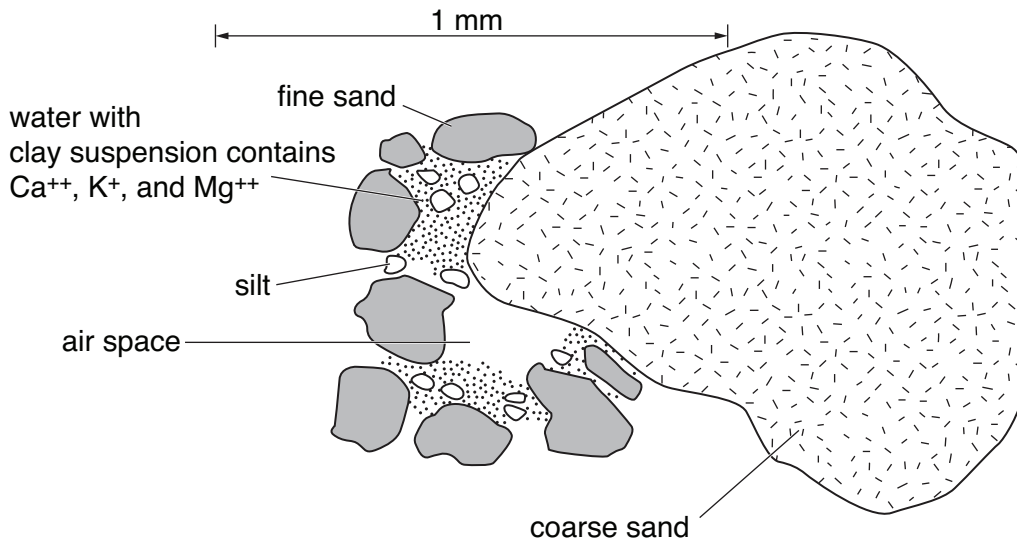
6 The pictures show four types of tractor tyre.



Put a ring around the tyre that would be **most** suitable for fitting to a tractor used for towing a mower on a grass playing field.

[1]

7 The diagram shows a loam soil crumb, as seen under a microscope.



(a) Which part of soil is missing from this diagram?

- A inorganic particles
- B ion particles
- C mineral particles
- D organic particles

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

(b) The maximum size of the fine sand particle labelled on the diagram is 0.20 mm.

How could you check this using the diagram?

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

(c) Suggest how the soil crumb in the diagram might differ if the soil was acidic **or** lime deficient.

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



8 The picture shows a garden slug.



Explain **one** way the slug is adapted to living and feeding on the soil surface.

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

- 9 The picture shows a ghost slug.  
This is a new species to this country.  
It lives in the soil.



The ghost slug is carnivorous and feeds mainly on earthworms.

Suggest two effects on **soil structure** that would result if the ghost slug becomes widespread.

- 1 .....
- .....
- 2 .....
- ..... [2]

10 The photograph shows a flame weed killer.

This is a method of organic weed control.

The hot flame passing over the weeds damages the leaves.

This causes the weeds to dehydrate and die.



Suggest **one** way this method of weed control might harm the ecosystem.

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

11 Japanese knotweed was introduced into Britain in the 19th century.

It is now a widespread weed.

Pulling it up by hand usually leaves parts of the underground stem in the soil. These parts then grow into new plants.

It is currently controlled with chemicals.

The chemicals used must **not** harm the environment.



(a) State **two** properties of the chemicals needed to ensure safe use.

1 .....

.....

2 .....

..... [2]

(b) An organic method is proposed for the control of knotweed.

This method uses Japanese jumping plant lice.

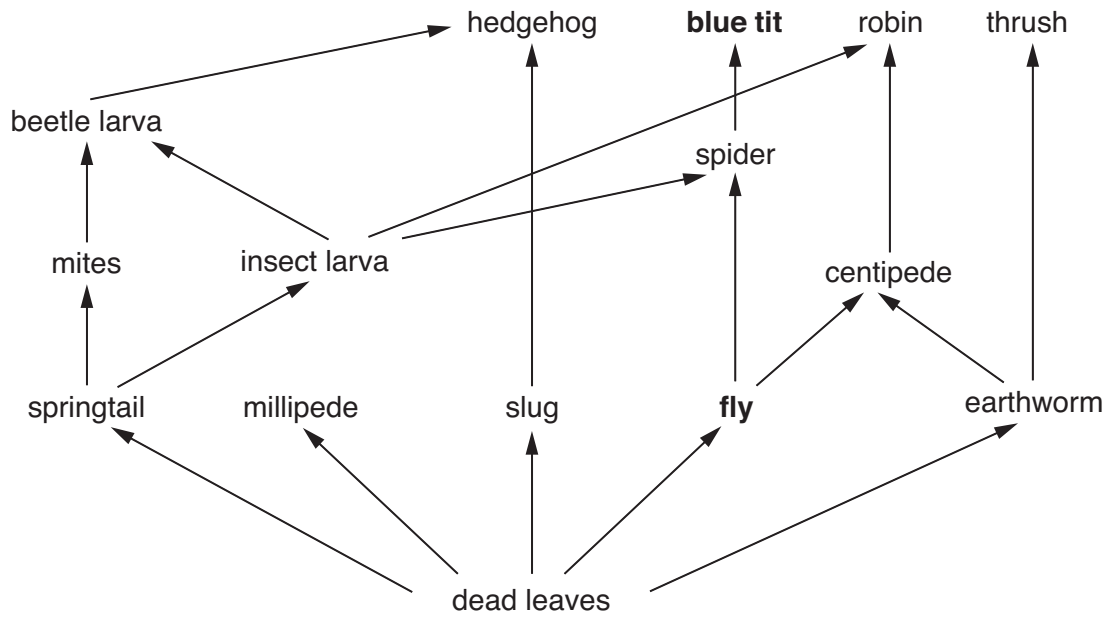
The lice feed on the knotweed.

Suggest **one** possible disadvantage of this method of weed control.

.....

..... [1]

12 The feeding relationships of some organisms in a garden are shown below.



State two reasons why **all** of the energy available in the fly does not reach the blue tit.

- 1 .....
- .....
- 2 .....
- ..... [2]

13 The photograph shows one type of wetland in the UK.



Other types of wetland are ponds, ditches, dykes, canals, reservoirs, and bogs.

Many are being destroyed.

Name **two** threatened species living in a wetland and explain why they need the wetland to survive.

1 .....

2 ..... [2]



Each year the RSPB has a 'Big Birdwatch' weekend.

The RSPB average the numbers of birds seen in each garden.

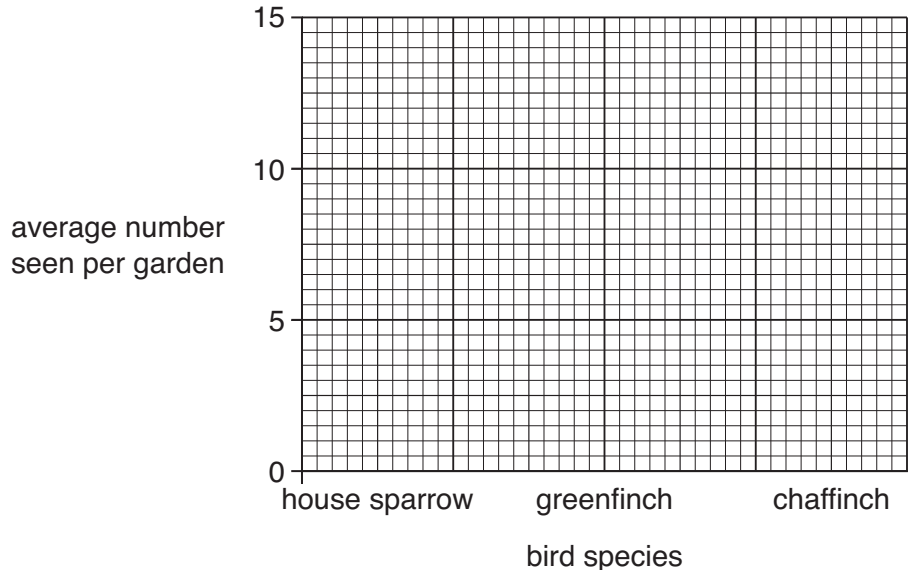
(a) The table shows the results for the Western Isles.

The birds are put in order – the most seen at the top.

Western Isles	
top ten bird species	average number seen per garden
starling	21.00
house sparrow	10.50
blackbird	3.34
greenfinch	3.00
collared dove	2.79
chaffinch	2.32
feral pigeon	1.09
robin	0.89
hooded crow	0.89
great tit	0.66

The bar chart is for three of the birds in the table.

Complete the bar chart for the three birds.



[2]



(b) The table shows the results for the urban areas, Greater London and the West Midlands.

The birds are put in order – the most seen at the top.

Greater London		West Midlands	
five common bird species	average number seen per garden	five common bird species	average number seen per garden
starling	3.14	house sparrow	3.62
house sparrow	2.63	starling	2.86
woodpigeon	2.38	blackbird	2.51
blue tit	2.09	woodpigeon	2.34
blackbird	1.72	blue tit	2.31

Look at these results.

A similar number of gardens are involved from each of the urban areas.

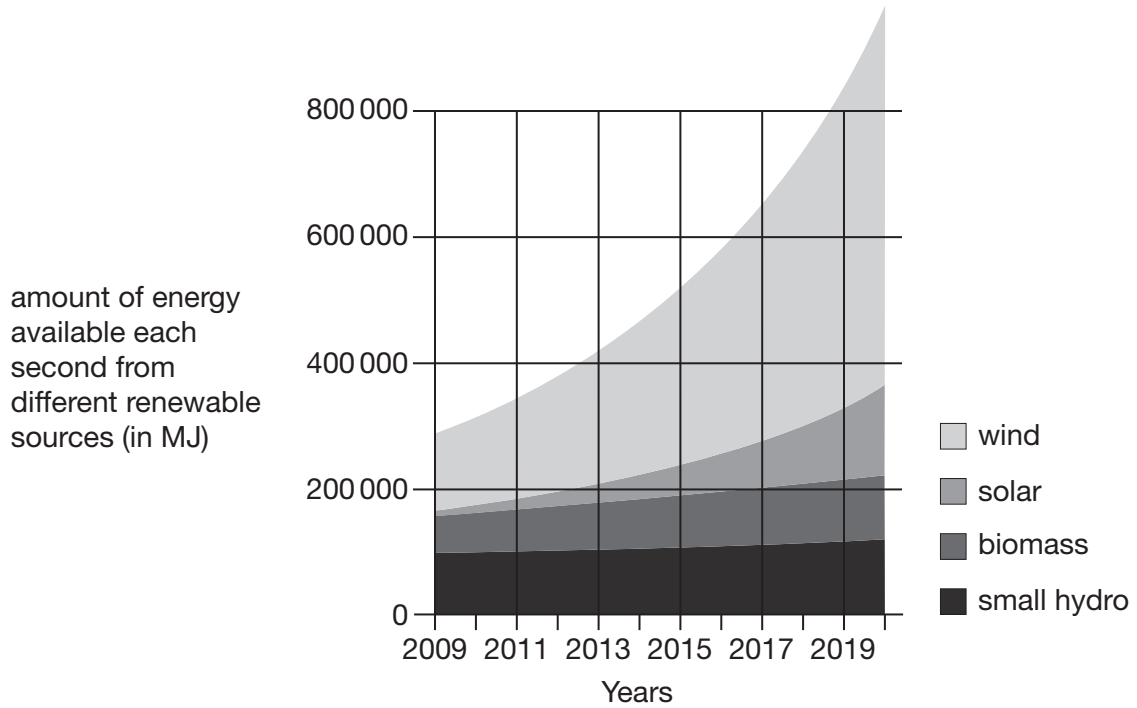
For each bird species calculate the **sum** of the average number seen per garden in Greater London and in the West Midlands.

- (i) Record your answers in the **sum of averages** column in the table below.
- (ii) Use these answers to put the birds in the **correct order**, the most seen at the top, the least seen at the bottom.

bird species	sum of averages	correct order
blackbird	4.23	
blue tit		
house sparrow		
starling		
woodpigeon		

[2]

15 The graph shows the projected amount of energy to be obtained by different renewable sources over ten years.



Which renewable source is projected to make the most % **(percentage) increase** in the ten years from 2009?

Explain the reason for your choice.

.....

.....

.....

..... [2]

16 The Government is planning a coastal path all round Britain's coastline.

Access is to be free to all.

The picture shows the sign that was put up on a Devon coastal path beauty spot. The path runs alongside a steep cliff next to the sea.



Suggest **three** possible risks to the public using this coastal path, other than the tides.

Describe how these other risks may be pointed out to the public without using unsightly signs.

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..... [3]

17 The picture shows farm slurry being spread on to farmland.

EU legislation prevents the spreading of farm slurry (animal waste) during autumn and winter.

This is in order to reduce nitrate pollution.



Explain the stages of nitrate pollution in water courses.

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[3]

- 18** In order to improve the successful artificial incubation of pheasant eggs, a greater understanding of natural incubation is needed.

A project is to be carried out to determine the environmental conditions existing in a pheasant's nest during natural incubation.

Describe how ICT might be used to collect the information in this project.

.....

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..... [2]

**END OF QUESTION PAPER**

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