

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

Management of the Natural Environment (Higher Tier)

WEDNESDAY 21 MAY 2008

Afternoon
 Time: 45 minutes

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
 Electronic Calculator
 Pencil
 Ruler (cm/mm)



Candidate Forename

Candidate Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

INFORMATION FOR CANDIDATES

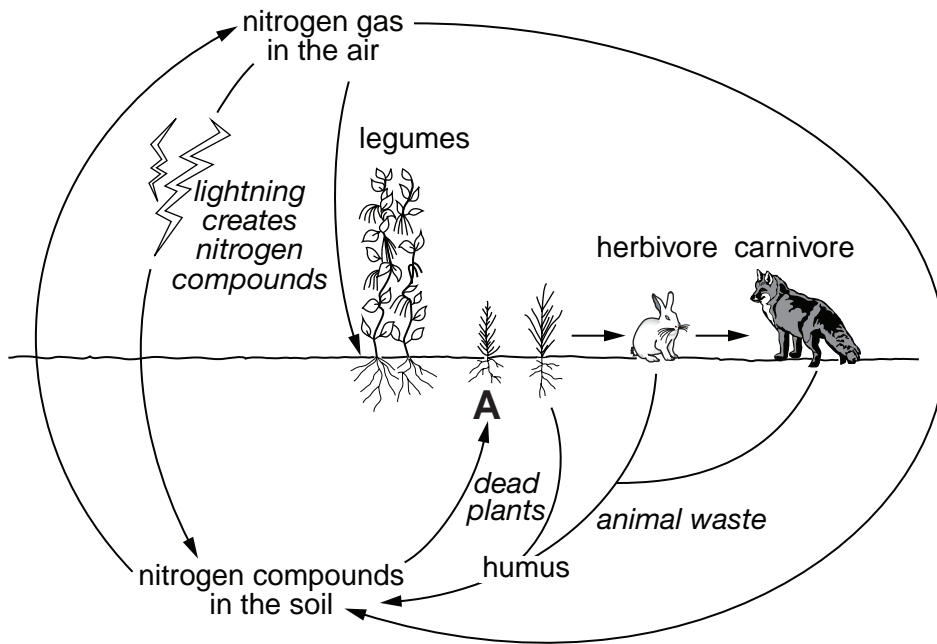
- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.

FOR EXAMINER'S USE		
		Mark
TOTAL	36	

This document consists of **20** printed pages.

Answer **all** the questions.

1 The diagram shows the nitrogen cycle.



Which nitrogen compound does the letter **A** represent?

..... [1]

2 The table compares the qualities of four samples of soil **A**, **B**, **C** and **D**.

	samples			
qualities	A	B	C	D
water holding	fair	good	very good	poor
pH	7.0	6.5	5.0	7.0
% organic material	4.5	8.0	7.5	2.0
drainage	good	fair	poor	very good
% air	30	25	15	40

Which sample is from a **sandy** soil?

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

3 The photograph is of a moorland stream.

A school party is going to do field work and take samples from the stream.



© D Ratcliffe

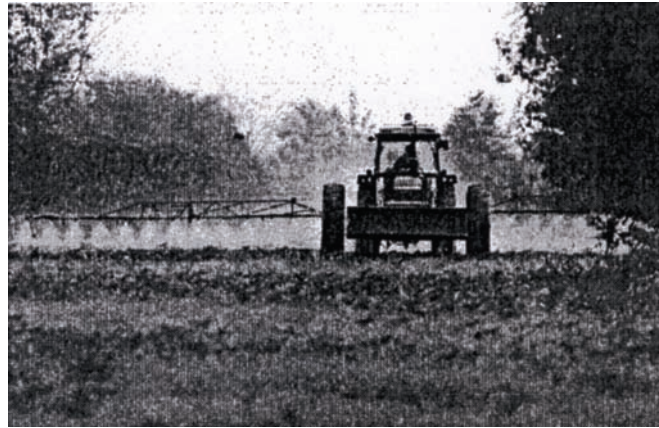
The teacher has to produce a list of instructions for the pupils.

Select **two** appropriate instructions for this field work.

- A bring a whistle and watch
- B carry a knife and rope
- C you do not need to bring water to drink because there is a stream
- D watch out for eels and pike that bite
- E wear light weight trainers
- F wear waterproof clothing

Choose **two** answers from **A, B, C, D, E** and **F** [2]

4 The photograph shows a field being sprayed with herbicide to kill all the plants.



iStock: © iStockphoto.com / Arrad Benedek

How will the food web in the field be affected by the herbicide?

Complete the following sentences using the words below

decrease

increase

stay constant

The number of carnivores will

The number of decomposers will

The number of herbivores will

The number of plants will

[2]

5 The photograph shows intensive egg production in a poultry house.



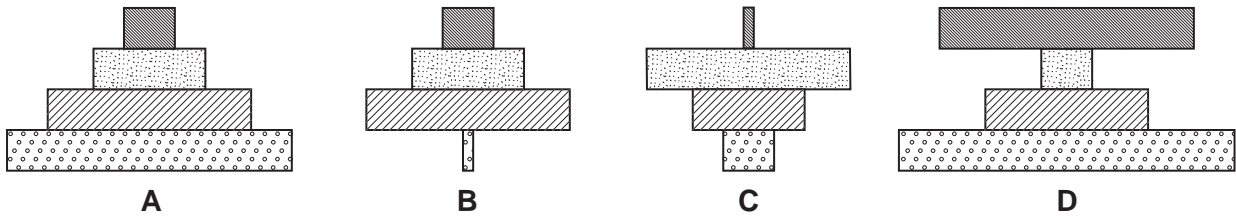
© Ministry of Agriculture, Fisheries and Foods

How does the environment benefit from intensive poultry production?





- A less labour intensive
- B less visual pollution occurs
- C natural ecosystems are left undisturbed
- D there are fewer inputs to global warming

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

6 The diagrams show pyramids of number.



key

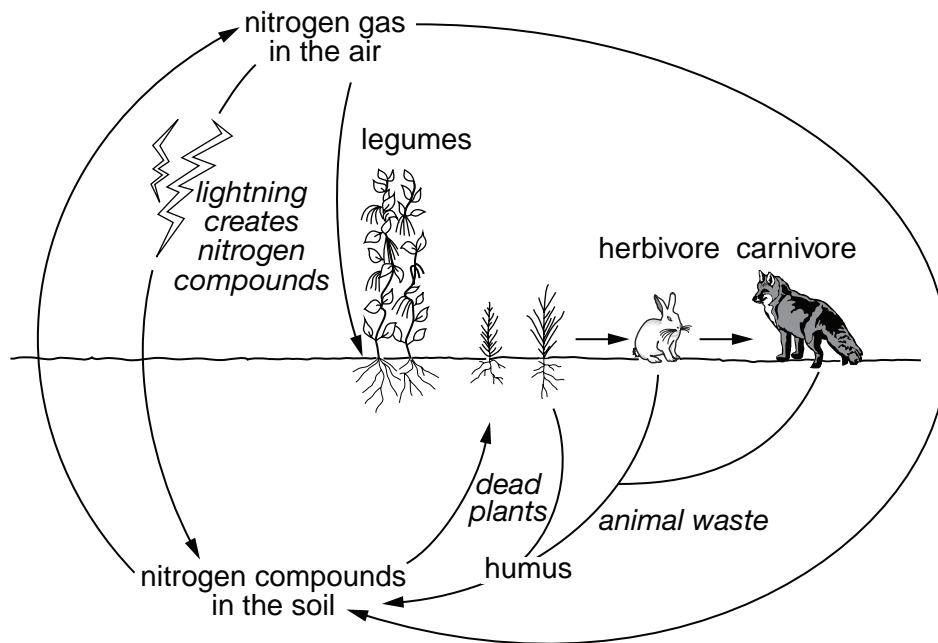
	tertiary consumer		primary consumer
	secondary consumer		producer

Which pyramid represents the following food chain?

oak tree → caterpillars → blue tits → sparrowhawks

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

7 The diagram shows the nitrogen cycle.



Nitrogen fixation takes place at several places in the cycle.

Label **two** places where this occurs using the letter **F**.

[2]

8 Look at these two photographs.



© Countryside Agency

an intensive farm landscape
in England



© Countryside Agency

an extensive farm
landscape in Poland

State **two** ways that farming using intensive monoculture can affect the environment.

- 1
-
- 2
- [2]

9 This headline appeared in a newspaper.

The organic food that is not as green as we think

Producing organic milk requires 80% more land than conventional milk.
Producing organic milk creates 20% more carbon dioxide.

The use of manure to fertilise the land can lead to the
acidification of the soil and the
pollution of water courses.

Select **one** of the environmental effects which are underlined.

Explain how it causes harm to the environment.

effect chosen

how it causes harm

.....

.....

..... [2]

10 The picture shows birds of prey.



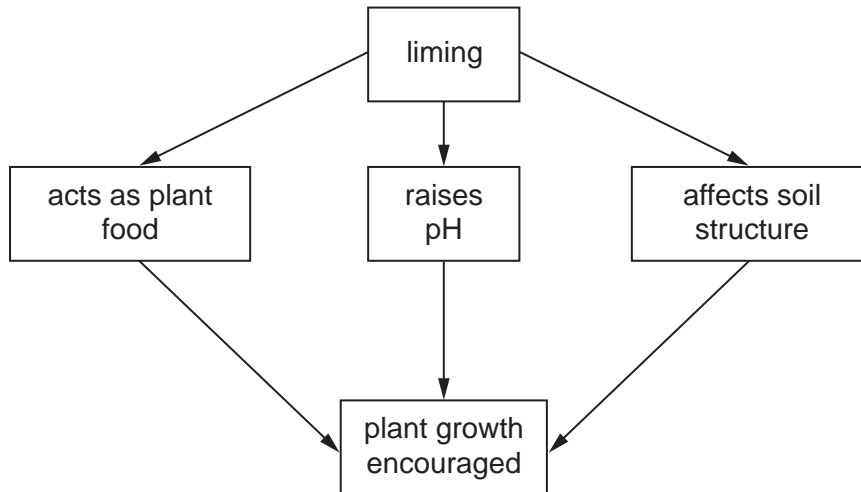
© George Rainbird Ltd

Explain **one** adaptation these birds show for catching their prey.

.....

..... [1]

11 The diagram shows the effect of adding lime to a soil.



(a) What is meant by **raises pH**?

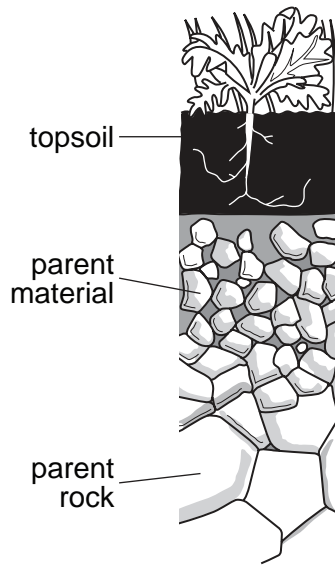
.....
..... [1]

(b) Adding lime raises pH.

Describe and explain **one other** effect the addition of lime would have on a clay soil.

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

12 The diagram shows a soil profile.



Living organisms help to form the top soil.

Name **two** soil organisms.

State how each helps in the formation of **top soil**.

organism

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

organism

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

13 The photograph shows a roundabout in the new town of Bracknell.

The local council encourages planting on larger roundabouts, rather than leaving them as mown grass.



© Institute of Biology

(a) Suggest **one** advantage of planting on roundabouts.

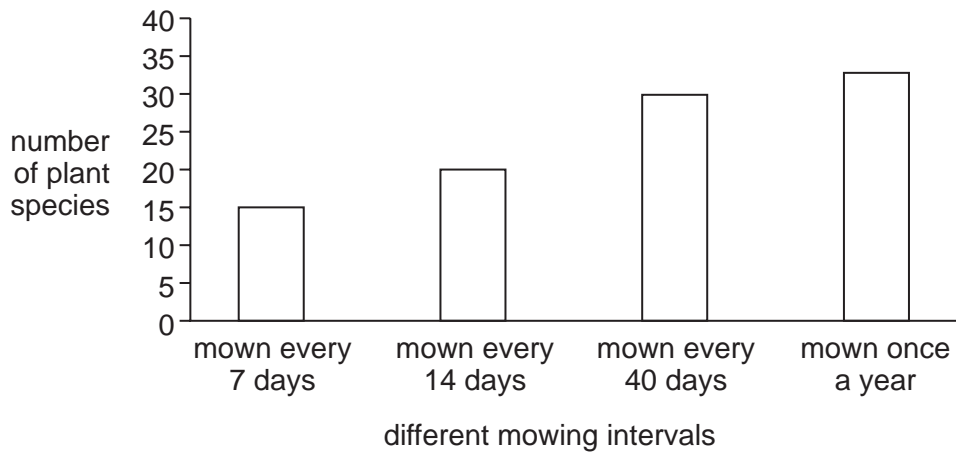
.....
..... [1]

(b) Suggest **one** disadvantage of planting on roundabouts.

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

(c) Roundabouts covered in grass were mown at different intervals of time.

The bar chart compares the numbers of plant species found on roundabouts with different mowing intervals.



Mowing at different intervals has an effect on the number of species.

State **two** general conclusions that can be made from the bar chart.

Use ideas about the relationship between mowing intervals and number of plant species.

- 1
-
- 2
- [2]

- 14 A theory in ecology states that the species diversity (number of different species found) is greater in many small areas than in one large area of the same total size.

The table compares the number of insect species found in two large nature reserves with the number of species found on the many roundabouts in a new town.

site	area in m ²	insect species on trees	insect species on grass	total insect species
Millpond Park nature reserve	68 681	32	13	45
Bill Hill nature reserve	43 574	28	10	39
small roundabouts	51 504	67	38	101

Does the data in the table support the theory?

Give reasons for your answer.

.....

.....

.....

.....

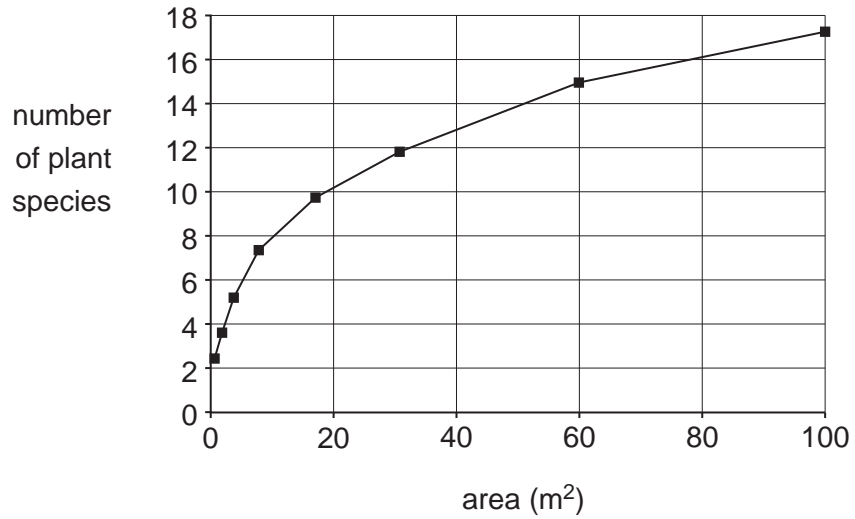
.....

.....

..... [3]

- 15 Plant species in a meadow were sampled by the random placing of 1 m² quadrats. The number of species seen in each quadrat was counted.

The graph shows the relationship between the number of plant species seen and the total number of quadrats used.



If you were repeating this survey, how many quadrats would you use?

Give reasons for your answer.

.....

.....

.....

..... [2]

16 Farmers can now receive additional funding for growing 'energy crops'.

Describe how crops can be used to produce electrical energy.

.....

.....

.....

.....

.....

..... [3]

17 The photograph shows a glasshouse which is used for intensively growing crops all year round.



© Hobsons Publishing

Explain **two** advantages of using ICT to monitor and control the environment in the glasshouse.

- 1
-
- 2
- [2]

18 Government support for different energy sources changed during the 20th Century.

The favoured energy sources at different times are shown in the table below.

Year	2000	alternative energy sources
Year	1970	natural gas
Year	1950	nuclear
Year	1900	coal

Suggest why Government policy on energy sources changed during the 20th Century.

.....

.....

.....

..... [2]

END OF QUESTION PAPER

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- Q. 8. Photograph of *Extensive Farm Landscape* in Poland, from *Eat the View*, Aug 2002. © Countryside Agency. www.countryside.gov.uk
- Q. 10. J Fisher. Photograph of *White Tailed Eagle and Osprey*, *Thorburn's Birds*, Plate 25. Ebury Press 1967. © George Rainbird Ltd.
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