

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE
B681/02
ENVIRONMENTAL AND LAND-BASED
SCIENCE**

**Management of the Natural
Environment (Higher Tier)
FRIDAY 16 JUNE 2017: Morning
DURATION: 1 hour
plus your additional time allowance
MODIFIED ENLARGED 24pt**

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Pencil

Ruler (cm/mm)

Calculator

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION FOR CANDIDATES

The quality of written communication is assessed in questions marked with a pencil ().

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 50.

Answer ALL the questions.

- 1 The land based industries are considered to have an important part to play in providing the country with sources of alternative energy.**

Energy crops can be grown as a source of alternative energy.

Which of the following is the most likely reason why a land owner might choose to invest in energy crops?

- A Energy crops do not cause visual pollution.**
- B Predicted profits for energy crops are higher than other crops.**
- C Energy crops are ‘carbon neutral’.**
- D Energy production by energy crops is reliable.**

Choose A, B, C or D _____ [1]

[TOTAL: 1]

2 An understanding of the nitrogen cycle is important for farmers if they are to maximise yield.

Describe TWO ways in which the farmer could INCREASE the amount of nitrogen which is available to plants.

1 _____

2 _____

[2]

[TOTAL: 2]

3 (a) A commercial orchard is an example of an artificial ecosystem.

The biodiversity in this ecosystem will be different from a natural ecosystem.

Give TWO reasons for this difference

1 _____

2 _____

[2]

(b) A commercial orchard is a form of intensive production.

Give THREE environmental disadvantages of this intensive production.

1 _____

2 _____

3 _____

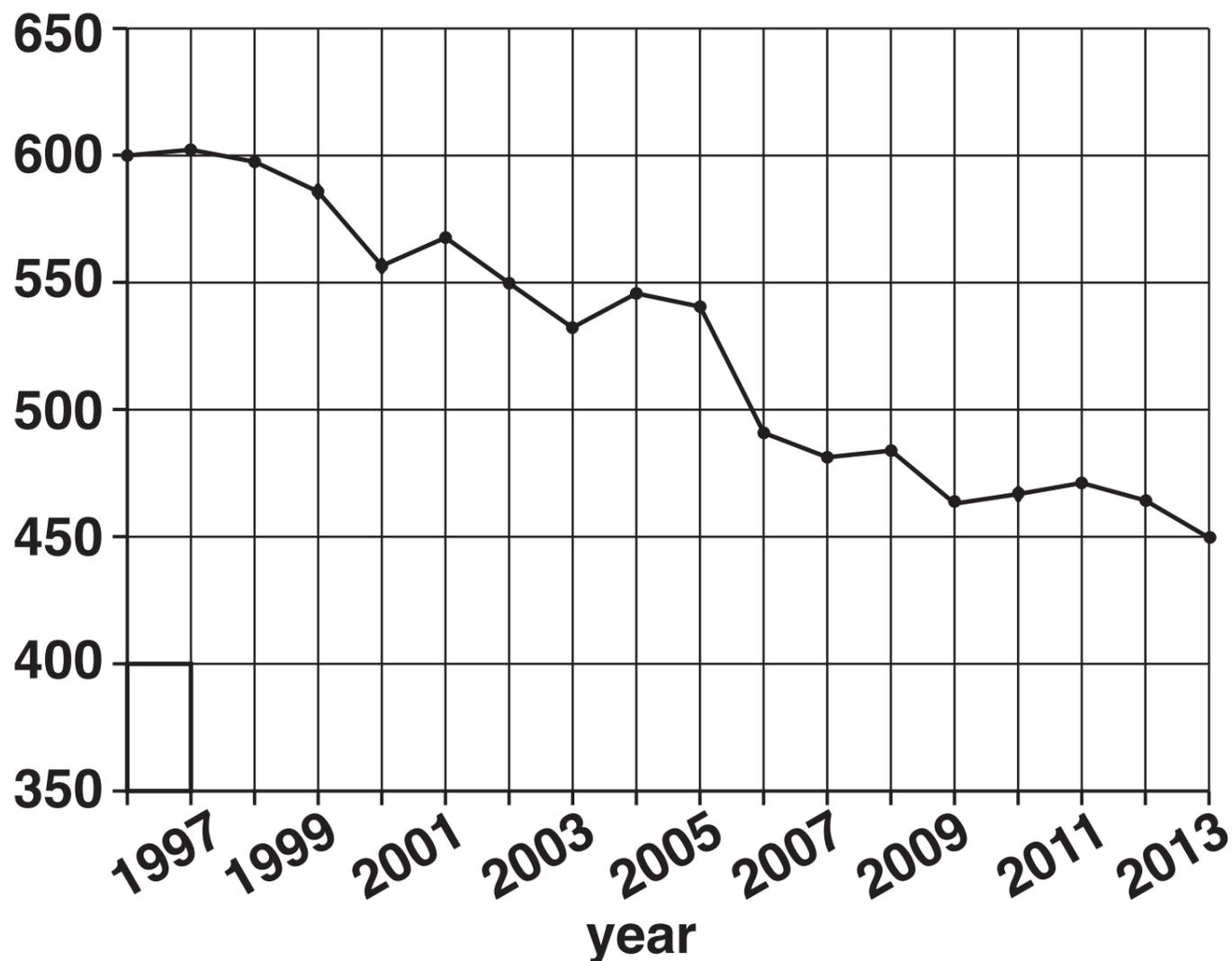
[3]

[TOTAL: 5]

- 4 The graph shows the total number of people employed on farms in the UK between 1996 and 2013.

TOTAL FARM EMPLOYMENT 1996–2013

total number
employed (thousands)



- (a) Calculate the percentage change in the number of people employed in farming between 1996 and 2013.

Show your working.

percentage change = _____ % [2]

(c) How might the changes in employment numbers affect the character of the countryside?

[3]

[TOTAL: 11]

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- 5 A local conservation group keeps records on the number of water birds using its nature reserve.

They use the information to monitor the changes in population in the short term and long term.

Here are results for 2014.

Species	Sample size	% Change 2013–2014	% Change 1995–2013
Mute swan	255	–6	28
Greylag goose	215	34	215
Canada goose	492	25	66
Shelduck	147	9	–9
Gadwall duck	39	–26	99
Mallard duck	1329	–1	14
Tufted duck	157	–22	32
Goosander duck	41	–20	–19

- (a) Which species showed the greatest increase in numbers between 2013 and 2014?

_____ [1]

(b) Give TWO reasons why the conservation body might NOT be concerned about the change in Mallard duck numbers.

1 _____

2 _____

[2]

(c) Which bird species should the conservation body be MOST concerned about?

Using the data from the table, give reasons for your answer.

_____ **[3]**

[TOTAL: 6]

7 Adding lime to a clay soil will change its pH, but it will also cause flocculation of the soil.

What is flocculation AND how does it occur?

[2]

[TOTAL: 2]

8 Which of the following are required by ALL soil organisms:

- A light and humus**
- B light and water**
- C oxygen and humus**
- D oxygen and water**

Choose A, B, C or D _____ [1]

[TOTAL: 1]

(b) Extreme weather conditions have also resulted in a number of communities experiencing flooding.

Give THREE ways in which the management or use of the land may help to prevent these problems from occurring.

1 _____

2 _____

3 _____

[3]

[TOTAL: 9]

10 Scientists are trialling a range of genetically modified (GM) crops.

A gene for herbicide tolerance has been introduced into crop plants.

This has been shown to increase yield by an average of 21%.

Some scientists think that they would get a similar increase in yield in this country if this characteristic was given to wheat.

(a) The current average wheat yield in the UK is 8.5 tonnes per hectare.

Calculate the yield for the new GM wheat.

Show your working.

yield = _____ tonnes per hectare [2]

(b) Describe how the ‘herbicide tolerance’ characteristic could be added to wheat.

[3]

(c) Other than herbicide tolerance, give ONE advantage and ONE disadvantage of growing a genetically modified (GM) crop.

advantage – _____

disadvantage – _____

[2]

[TOTAL: 7]

END OF QUESTION PAPER

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