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**Thursday 12 June 2014 – Morning**
**GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE**
**B681/02** 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)

**Duration:** 1 hour


Candidate forename		Candidate surname	
Centre number		Candidate number	

**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. 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. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

**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**.
- This document consists of **16** pages. Any blank pages are indicated.

2

Answer **all** the questions.

- 1 Timber production in the UK often takes place in managed forest plantations.



Which **one** of the following is a reason for using this production system?

- A adaptable – can be used anywhere in the country
- B efficient – maximises land use
- C environmental – maximises the biodiversity in an area
- D predictable – tree growth can be timed

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

[Total: 1]

3

- 2 This farm is collecting run-off water from irrigation.

The farmer can then re-use the water for future irrigation.

Which **one** of the following might be the **greatest** risk from re-using this water for irrigation?

- A collected water may contain nutrients
- B run-off water may contain herbicides
- C the water may contain silt and clay
- D water will evaporate before collection

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

[Total: 1]

Question 3 begins on page 4.

4

**3** Many land-based activities are hazardous.

A risk assessment is needed before starting work.

The following are stages in producing a risk assessment. They are not in the right order.

- Identify the potential hazards involved.
- Identify methods to reduce the risk.
- Consider the task to be done.
- Consider the level of risk.
- Record your findings.

Put the stages for a risk assessment in the correct order.

One has been done for you.

consider the task to be done

**[1]****[Total: 1]**

5

- 4 Genetic modification (GM) may be used to speed up the selective breeding process in farm animals.

Suggest how using GM techniques allow faster development of new characteristics.

.....

.....

..... [2]

[Total: 2]

- 5 Adding lime to soil changes:

- the pH value
- the availability of nutrients.

Lime also causes clay soils to change in a process called 'flocculation'.

What is flocculation?

.....

..... [1]

[Total: 1]

6

- 6 Sea eagles are large birds of prey that became extinct in the UK in 1916.

Conservationists have worked on plans for many years to reintroduce sea eagles to Scotland.



When sea eagles are reintroduced, what effects might this have on the local ecosystem?

.....

.....

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..... [3]

[Total: 3]

- 7 Landscape fabric is a black plastic sheet with small holes.

It can be used to suppress weeds around plants.

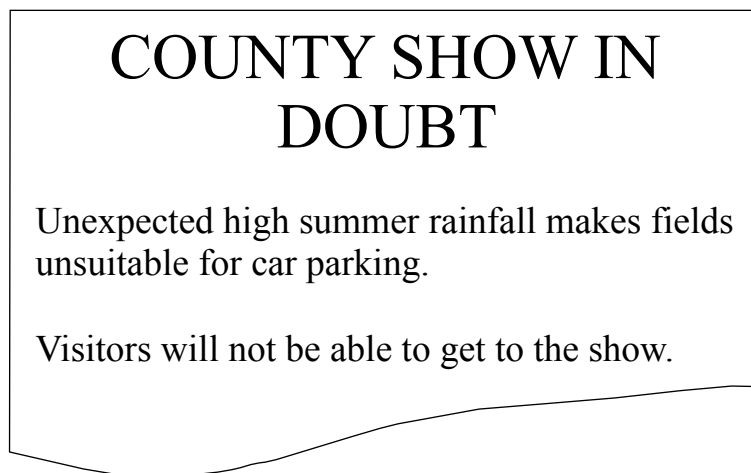
In addition to weed control, suggest **one** other advantage of using this material.

.....

..... [1]

[Total: 1]

- 8 A headline from a local newspaper is shown below:



The show site is on a clay loam soil.

If the show goes ahead:

- (a) Describe the effect large numbers of vehicles could have on the soil properties.

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

- (b) What should be done to restore the soil to its previous condition?

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

- (c) If the field is not restored to its original condition, explain why the fertility of the field will be reduced.

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

[Total: 5]

**9** Researchers have compiled statistics on farm owners in the UK.

The data below show the percentage of farm owners in each age group.

	Percentage (%) of farm owners							
	1997	2000	2003	2005	2007	2009	2011	2013
Under 35 years	5	5	3	3	3	3	2	2
35–44 years	18	18	15	14	12	11	10	9
45–54 years	28	26	24	23	23	23	22	
55–64 years	27	26	29	29	29	29	30	30
65+ years	22	25	29	31	33	34	36	37

**(a)** Complete the table. [1]

**(b)** Describe the trend in the age of the farm owners.

..... [1]

**(c)** Suggest a reason for this trend.

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

**(d)** If these trends continue, there will be implications for the way the land is managed.

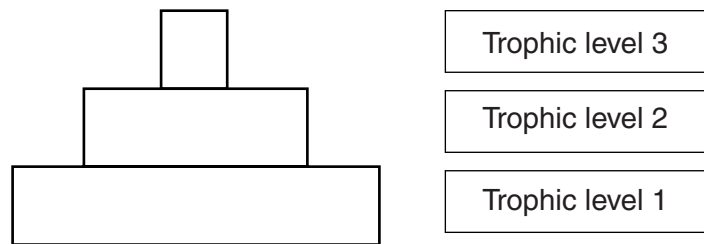
Using the data, suggest how the management of the land might be affected by these changes.

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

**[Total: 5]**

9

- 10 The diagram shows a pyramid of energy for an extensive production system on a farm.



Energy is lost in the transfer from one trophic level to another.

Explain why this happens.

.....

.....

..... [2]

[Total: 2]

Question 11 begins on page 10.

10

- 11 Fossil fuels will become more scarce in the future.

The land-based industries will have a major role to play in meeting future energy needs.

Biogas is seen to have great potential.

Explain how farmers might develop the production of **biogas** on their farms so that it helps to meet the national energy needs.



*The quality of written communication will be assessed in your answer.*

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..... [6]

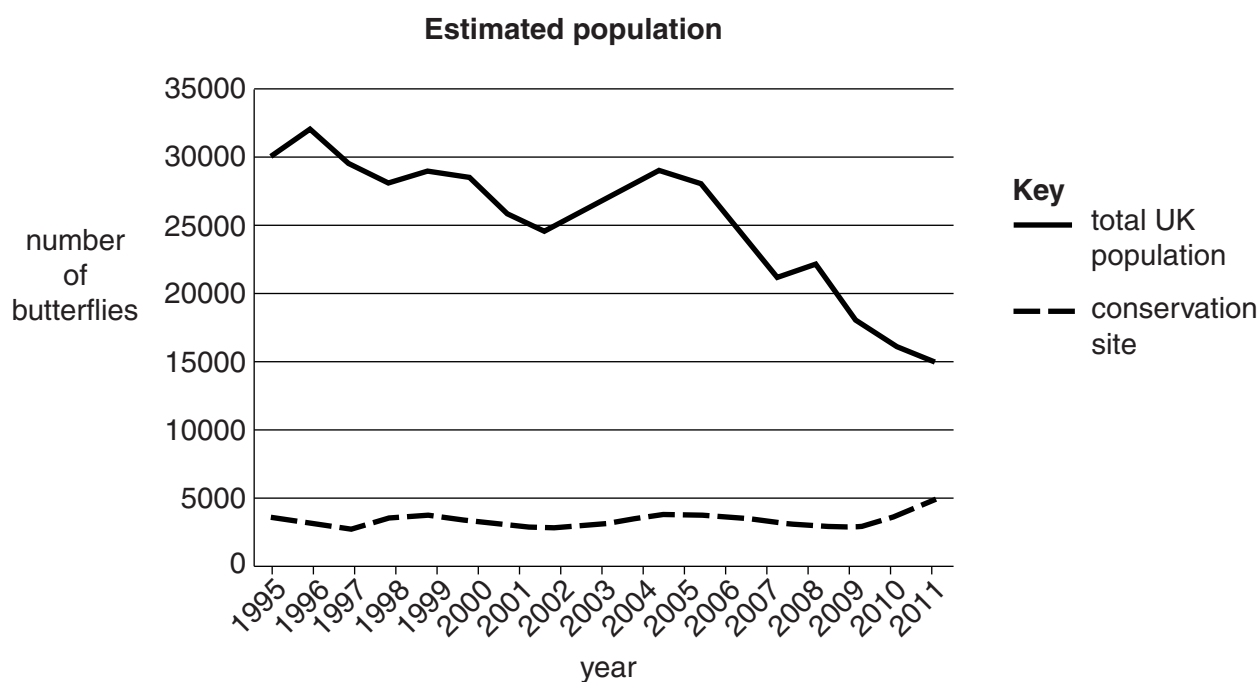
[Total: 6]



**14** Some species of butterfly are endangered.

For one butterfly species the graph shows:

- the total UK population
- the numbers at one conservation site.



**(a)** Suggest reasons for the trends shown on the graph.

.....

.....

..... [2]

**(b) (i)** In 2011, what percentage of the UK population of the species was located at this conservation site?

Answer ..... % [1]

**(ii)** Why might this be a problem?

.....

..... [1]

13

- (c) A butterfly charity wants to save this species from extinction.

Use the data to suggest how the charity could spend money to do this.

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

- (d) The data show how the numbers of this butterfly species have changed.

Suggest how sampling methods might have produced errors in the data.

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

[Total: 7]

Question 15 begins on page 14.

14

15 A local farmer wants to build a large intensive dairy unit for 40 000 cows.

This will involve major construction and building of new roads to meet the needs of increased traffic.

The farm is located alongside a Site of Special Scientific Interest (SSSI).

The local environmental groups are worried that the new dairy unit will:

- increase air pollution due to traffic
- increase water pollution due to run-off
- affect local wildlife
- cause massive visual impact.

The local government will need to give planning permission.

The dairy unit needs to be designed to minimise environmental impact.

Suggest what conditions the local government should insist on to protect the environment.



*The quality of written communication will be assessed in your answer.*

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..... [6]

[Total: 6]

**END OF QUESTION PAPER**

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