

Friday 12 June 2015 – Afternoon

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B681/01 Management of the Natural Environment (Foundation Tier)

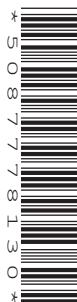
Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)
- Calculator

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 **20** pages. Any blank pages are indicated.

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3

Answer **all** the questions.

- 1 Farmers can use their land in different ways.

One way is to install solar panels to generate electricity.

As well as saving on electricity bills, there could be other advantages of using land for solar panels.



Which **one** of the following is the **best** advantage of using land for solar panels other than to generate electricity?

- A Animals will have somewhere to shelter when it rains.
- B Land can be used that would not be suitable for growing crops.
- C Fewer weeds will grow.
- D There will be less space for planting crops.

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

[Total: 1]

4

2 The ring-necked parakeet is a tropical bird from Asia and Africa.

These birds have been kept as pets in the UK.

Some ring-necked parakeets escaped into the UK countryside.



(a) Suggest **two** reasons why these birds are now breeding successfully in the UK countryside.

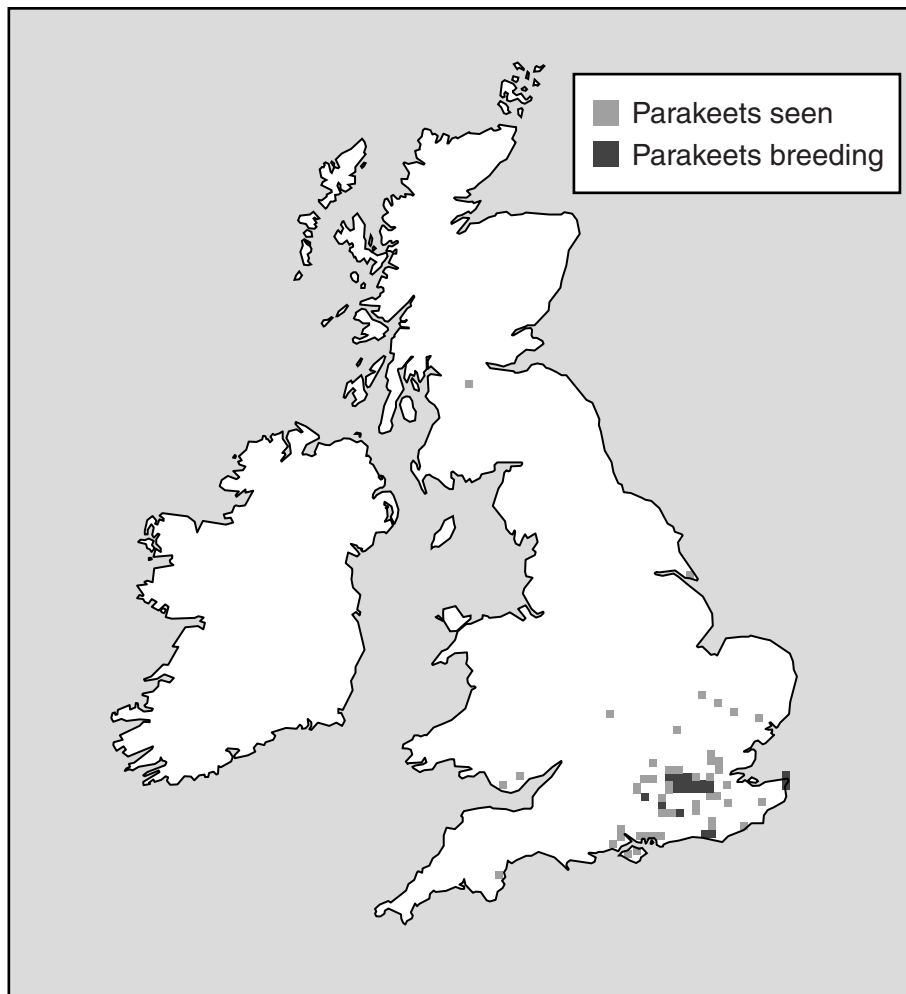
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5

(b) The map shows where ring-necked parakeets have been seen and are breeding in the UK.



Suggest reasons for this distribution.

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6

- (c) Scientists have sampled the population of ring-necked parakeets living in the wild.

They estimate there are now 60 000 ring-necked parakeets in the wild.

The number of these birds is rising at a rate of 20% per year.

- (i) Calculate the expected number of ring-necked parakeets in one year's time.

Answer [1]

- (ii) There has been a rapid increase in the population of ring-necked parakeets.

Suggest **two** effects this increase might have on the local ecosystem.

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..... [2]

[Total: 7]

3 The picture shows a UK woodland.



Describe **three** different environmental factors that could affect this habitat.

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..... [3]

[Total: 3]

- 4 Students studied the numbers of animals feeding on **one** oak tree.

The table shows their results.

Animal	Number	Food which each animal eats
Moth larvae	96	leaves from the oak tree
Wren	5	moth larvae
Vole	3	fruits from the oak tree
Hawk	1	blue tits and wrens
Blue tit	4	moth larvae
Ground beetle	5	moth larvae

- (a) Use the students' results to complete the table below.

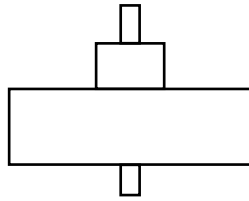
Trophic level	Name(s) of organism(s)	Total number of organism(s)	Biomass (arbitrary units)
Tertiary consumers			15
Secondary consumers			132
Primary consumers			651
Producer		1	30254

[4]

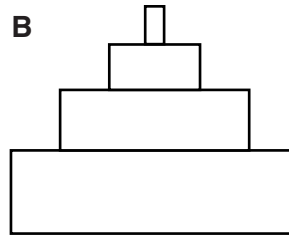
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(b) Which of the following best represents the shape of the pyramid of biomass?

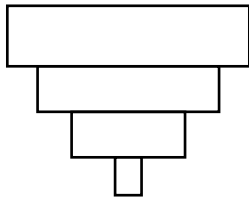
A



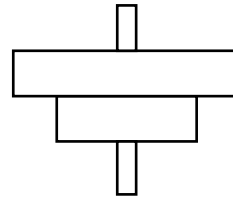
B



C



D



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

(c) The students noticed that the blue tits were nesting.

How might the balance in this ecosystem be affected when their chicks leave the nest?

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..... [2]

[Total: 7]

Question 5 begins on page 10.

10

- 5 Large farming machinery is expensive to buy and takes up a lot of storage space.



Suggest reasons why a farmer may be willing to buy another large machine.

Use ideas about efficiency, environmental impact and health and safety in your answer.



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

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[Total: 6]

- 6 Some students are counting orchids at a nature reserve.

They use quadrats to sample the orchids in the nature reserve.

The quadrats measure $1\text{ m} \times 1\text{ m}$ (1 m^2).

The quadrats are placed randomly across the nature reserve.

Twenty results are shown below.

Number of orchids in each quadrat				
3	2	1	0	1
0	0	0	3	0
2	0	0	1	1
0	0	2	0	2

- (a) (i) What is the mean number of orchids in a quadrat?

Answer [1]

- (ii) The nature reserve measures $100\text{ m} \times 100\text{ m}$.

What would be the predicted number of orchids in this nature reserve?

Answer [1]

(b) An Information Sheet for the nature reserve is shown below.

Pathlands Nature Reserve

This is a traditionally grazed sloping pasture with a shallow topsoil and a chalky subsoil.

The land is part of an organic farm.

The reserve contains a wide collection of wild orchids which flower in the spring. The site is then grazed in the late summer.

Visitors are welcome but they must not disturb the plants and animals.



Use the Information Sheet to answer the following questions.

(i) The soil pH is most likely to be:

3 ☐

5 ☐

7 ☐

9 ☐

Tick (✓) one box only.

[1]

(ii) The soil is most likely to be:

peaty ☐

sticky ☐

well drained ☐

wet ☐

Tick (✓) one box only.

[1]

13

(iii) The organisation most likely to be involved with the management of these orchids is:

- A** Natural England
- B** National Trust
- C** RBST
- D** RSPB

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

(c) The orchid population in the nature reserve is increasing.

Use the Information Sheet to suggest **three** reasons why the number of orchids is increasing.

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[Total: 8]

A black and white photograph of a field of tall grasses and wildflowers, likely a meadow or pasture, with a dense line of trees in the background. The field is filled with tall, thin grasses and numerous small, light-colored flowers, possibly daisies, scattered throughout. The background is a dark, dense line of trees and shrubs. The overall scene is a natural, open landscape.



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16

8 A sample of soil contains only sand, silt and clay.

(a) Students have identified that this sample of soil contains:

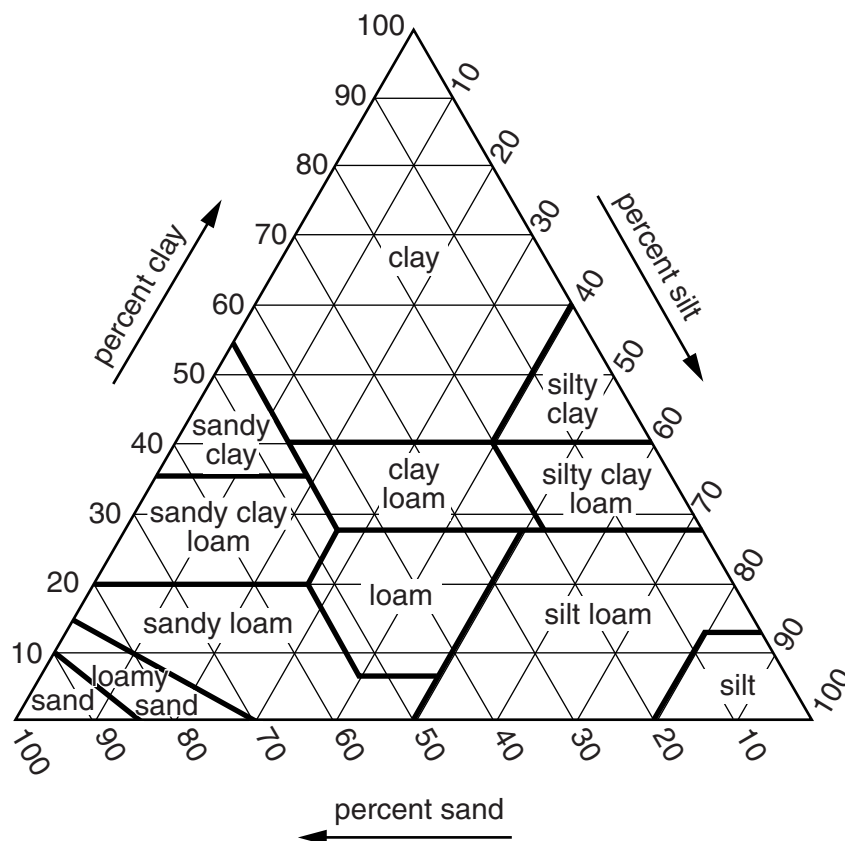
35% sand

40% silt

What is the percentage of **clay** in this sample of soil?

Answer% [1]

(b) A soil triangle can be used to identify the soil type in the sample.



Use the soil triangle to identify the soil type.

Answer [1]

17

(c) Use the soil triangle to complete the table for a **loamy sand** soil.

Soil component	%
Sand	
Silt	
Clay	

[2]

(d) Describe **two** ways a loamy sand soil can be improved so that it holds more water.

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..... [2]

[Total: 6]

18

- 9 A farmer in an area of outstanding natural beauty plans to use some of the farm for a caravan site.



Describe the responsibilities of the farmer to conserve the natural environment if the plan goes ahead.



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

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[Total: 6]

END OF QUESTION PAPER

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