

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE
B681/01
ENVIRONMENTAL AND LAND-BASED
SCIENCE**

**Management of the Natural
Environment (Foundation Tier)
FRIDAY 12 JUNE 2015: Afternoon
DURATION: 1 hour
plus your additional time allowance
MODIFIED ENLARGED 24pt**

Candidate forename						Candidate surname				
Centre number						Candidate number				

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. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).

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.

Any blank pages are indicated.

BLANK PAGE

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]

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

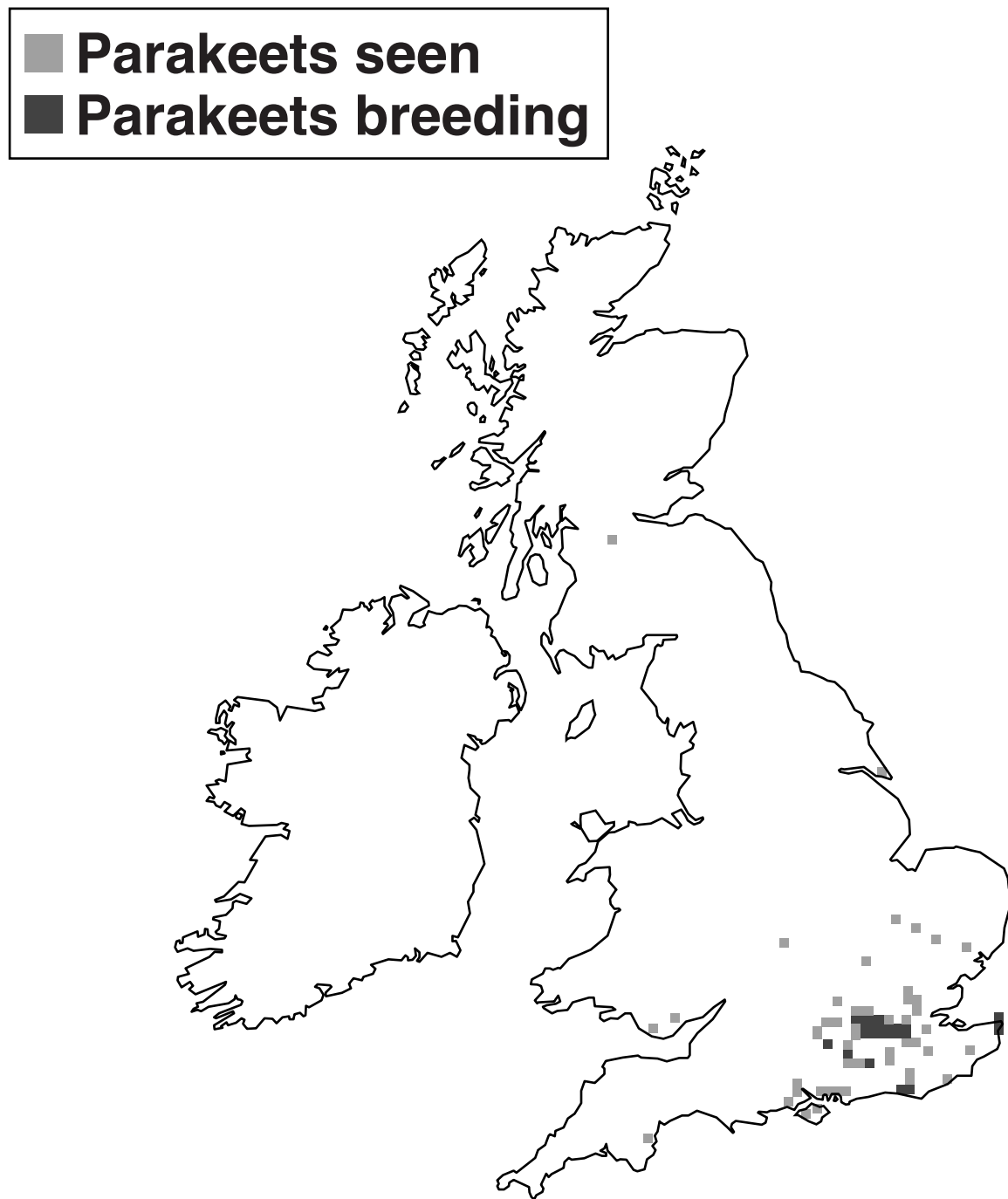
These birds have been kept as pets in the UK.

Some ring-necked parakeets escaped into the UK countryside.

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

[2]

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



Suggest reasons for this distribution.

[2]

(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.

_____ [2]

[TOTAL: 7]

3 The picture shows a UK woodland.



Describe THREE different environmental factors that could affect this habitat.

[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

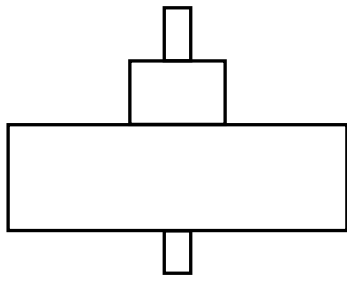
(a) Use the students’ results to complete the table below.

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	30 254

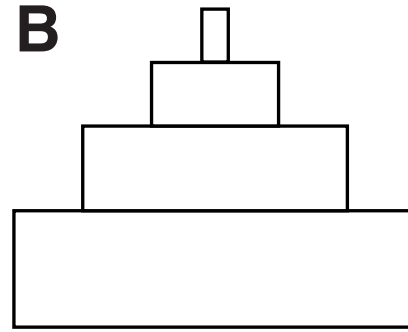
[4]

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

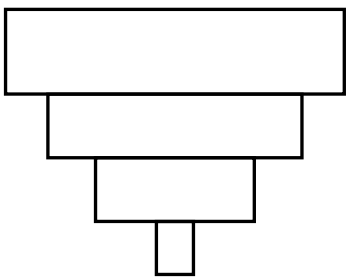
A



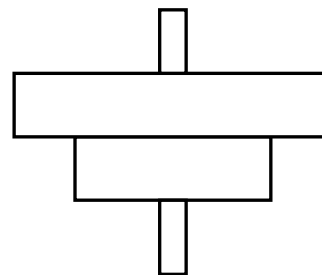
B



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?

[2]

[TOTAL: 7]

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.

[6]

[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]

(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.

[3]

[TOTAL: 8]

7 A land owner gets a grant to plant more hedges on some land.

Explain how the planting of more hedges may affect the MICROCLIMATE of the area.



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

[6]

[6]

[TOTAL: 6]

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

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

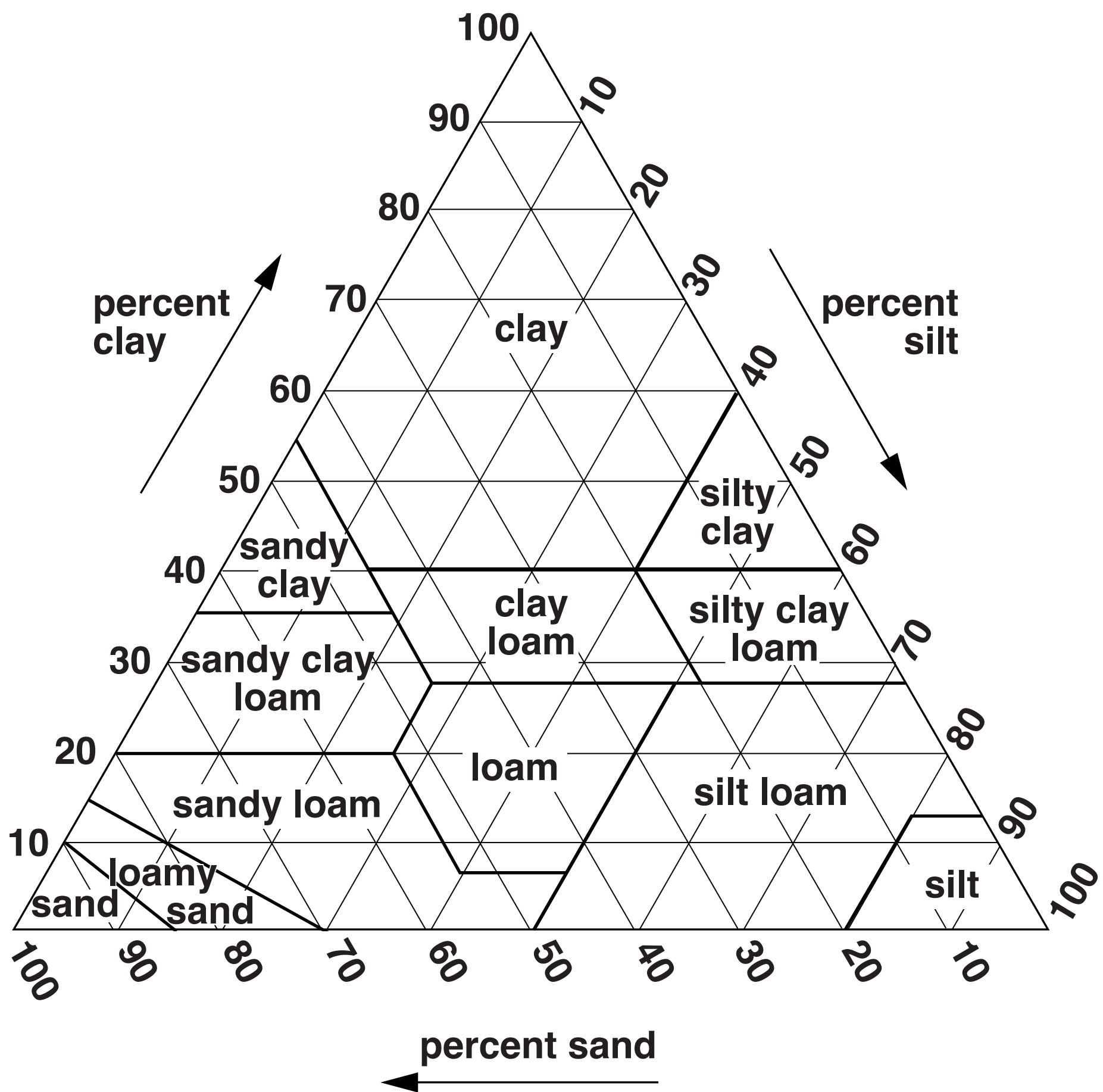
35% sand

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]

(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.

[2]

[TOTAL: 6]

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