

Wednesday 5 June 2013 – Afternoon

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.

Duration: 1 hour

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)



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

- Your 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.

Answer **all** the questions.

1 Earthworms are an important part of the soil ecosystem.



Which **two** of the following soil components do earthworms need?

Put ticks (✓) in the boxes next to the two correct components.

- carbon dioxide
- oxygen
- loam
- sand
- water

[2]

[Total: 2]

2 Students wanted to find out the population of dormice in a local area.

They sampled the area over a two-day period and estimated the population.

Their method was checked by the teacher.

The students found that their estimates varied a lot.

Which **one** of the following is the most likely cause of the variation in their estimates?

- A Food supply increased over the two days.
- B Dormice are not equally spread across the area.
- C The animals had hibernated during the sampling period so were not visible.
- D There was a large natural population increase between the different sampling times.

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

[Total: 1]

3 Some farmers collect and store rainwater on their farms.

This is called rainwater harvesting.

Choose the **best** reason for using rainwater harvesting.

- A It costs nothing to collect and use this water.
- B There is less dependence on other sources of water.
- C The taste of the water will be better.
- D The water will always be of better quality.

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

[Total: 1]

4 Field beans are an important crop in the UK and are often used as part of a crop rotation.



Choose the **best** reason for using field beans in a crop rotation.

- A They add nitrogen to the soil.
- B They improve soil structure.
- C They reduce water loss.
- D They repel soil pests.

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

[Total: 1]

5 The advert below appeared in a local newspaper.

PUBLIC AUCTION AGRICULTURAL LAND	
Lot 1	Area: 70 ha of level, open land Soil: sandy loam
Lot 2	Area: 20 ha of level, open land Soil: clay
Lot 3	Area: 50 ha of steeply sloping land Soil: humus rich/peaty

(a) (i) The soil in **Lot 1** is most likely to be...

- A ...alkaline.
- B ...free draining.
- C ...high in potassium.
- D ...waterlogged.

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

(ii) The soil in **Lot 2** is most likely to...

- A ...be high in bacteria.
- B ...blow away.
- C ...be free from disease.
- D ...be sticky.

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

(b) A farmer buys **Lot 3** and adds some lime to the soil.

Why was the lime added?

- A to increase the calcium available to the plants
- B to improve the drainage
- C to make the soil more acidic
- D to reduce the air content in the soil

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

(c) A holiday company wants to buy some land for a caravan park.

Which one of the lots should they bid for?

Give your reasons.

.....

.....

..... [2]

[Total: 5]

6 These wild ponies graze freely in a deciduous woodland.



Which **one** of the following is likely to happen because the ponies are part of this ecosystem?

- A increased population of deer
- B increased risk of flooding
- C reduced number of squirrels
- D reduced survival of tree seedlings

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

[Total: 1]

7 Animal production systems can be intensive or extensive.

Give the **environmental** advantages and disadvantages of using intensive housing systems for animal production.

.....

.....

.....

.....

..... [3]

[Total: 3]

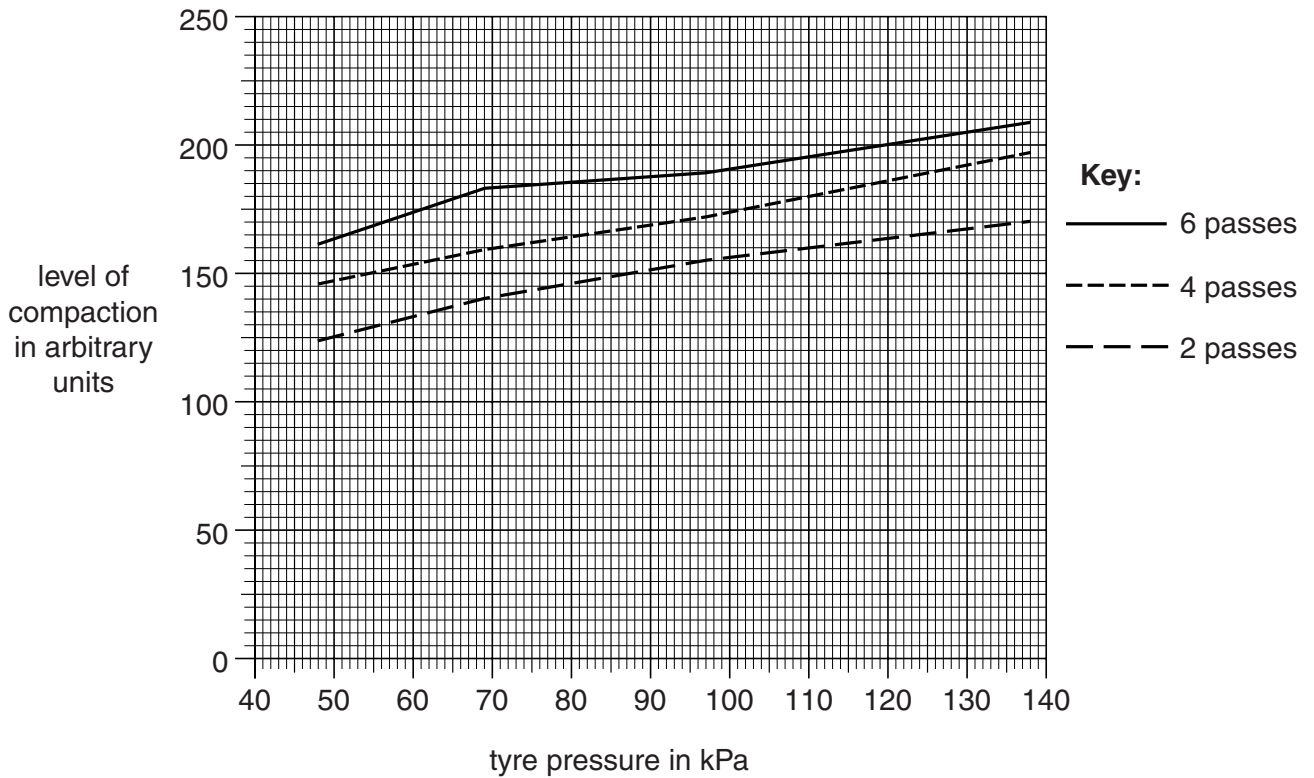
8 Researchers tested the effects of tyre pressure on soil compaction.

They used:

- the same tractor
- the same tyres
- different tyre pressures.

The researchers varied the number of times the tractor went over the soil (the number of passes).

The results are shown below.



(a) Describe the trends in the graph.

.....

.....

..... [2]

(b) A tractor with a tyre pressure of 97 kPa passes over the soil 8 times.

Predict the level of soil compaction.

Answer [1]

(c) A larger tractor has been designed which needs a tyre pressure of 138 kPa.

Why might a grower think that this tractor is a better option?

Refer to the data in your answer.

.....

.....

..... [2]

[Total: 5]

9 Scientists are developing a new herbicide.

They need to find out if it harms earthworms.

The herbicide was tested at different dilutions in four different soils.

The table shows the earthworm populations six months after the herbicide was added.

Application rate of herbicide	Soil 1		Soil 2		Soil 3		Soil 4	
	Number of worms	Total mass of worms (g)	Number of worms	Total mass of worms (g)	Number of worms	Total mass of worms (g)	Number of worms	Total mass of worms (g)
Zero	50	320	34	295	42	252	51	325
1 g per litre	47	300	35	301	40	242	50	315
5 g per litre	31	205	21	185	27	180	28	182
20g per litre	12	105	7	69	12	102	13	109

(a) Look at the results when zero herbicide was used.

In which soil is the **mean** mass of individual worms the greatest?

Suggest an explanation for the variation in the mean mass of the worms in the four soils.

.....

.....

.....

..... [3]

(b) Describe **two** effects of the application rate of herbicide on the **numbers** of earthworms in the four soils.

.....

.....

.....

..... [2]

(c) If this herbicide went into commercial use at 20g per litre, describe **three** possible effects its use might have on a pasture **ecosystem**.

.....

.....

.....

..... [3]

[Total: 8]

10 Weeds can be controlled by chemical or cultural methods.

One cultural method is to cover the soil with black polythene sheets.

Describe one **advantage** and one **disadvantage** of controlling weeds using black polythene sheets instead of using chemicals.

.....

.....

..... [2]

[Total: 2]

11 Briefly outline the work of a **named** conservation organisation.

Name of organisation

.....
.....
.....
..... [3]

[Total: 3]

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.