

Monday 11 June 2018 – Morning

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. 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.
- Do **not** write in the barcodes.

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 A farmer wants to build a dry stone wall on a farm.



Put ticks (✓) in the boxes next to the **two** best reasons for building a dry stone wall.

Cheaper than a barbed wire fence.

☐

Makes use of natural resources.

☐

Can be built quickly.

☐

Will last a long time.

☐

Requires no skill to build.

☐

[2]

[Total: 2]

3

2 Legumes are plants that have roots with swellings called nodules.

These nodules contain bacteria.

The bacteria turn nitrogen in the air into a nutrient that plants can use.

This process is known as:

- A** decay
- B** eutrophication
- C** fixation
- D** neutralisation

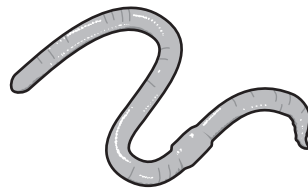
Answer **A, B, C** or **D** [1]

[Total: 1]

4

- 3 Earthworms are organisms that live in the soil.

Earthworms get nutrients from the soil.



Which **two** of the following do earthworms also need?

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

Light	<input type="checkbox"/>
Loam	<input type="checkbox"/>
Moisture	<input type="checkbox"/>
Oxygen	<input type="checkbox"/>
Tunnels	<input type="checkbox"/>

[2]

[Total: 2]

- 4 The pH of the soil will affect how well plants grow.

State **one** way a farmer can change the pH of the soil.

..... [1]

[Total: 1]

6

- 6 Students are working on a project to save water on the school farm.

They investigate how much water could be collected from the roof of each farm building.

All the buildings have a flat roof.

They measure the size of each roof.

Look at the table below.

Name of farm building	Dimensions in metres
Animal house	109 × 30
Milking parlour	48 × 22
Shed	18 × 90

- (a) Calculate the **total** roof area of the farm buildings.

Show your working.

Answer m² [2]

7

- (b) A new barn is built with a roof area of 2000 m^2 .

The annual rainfall on the farm is 0.75 m .

What is the volume of water that could be collected from this roof each year?

Put a ring around the correct answer.

750 m^3

1500 m^3

2667 m^3

7500 m^3

[1]

- (c) The students calculate that they could collect 6000 m^3 of rainwater each year from all the farm buildings.

The water could be stored in a reservoir on the farm.

It would cost £4800 to build a reservoir.

With a reservoir, they would not have to buy 6000 m^3 of water from the water company.

The water company charges the school farm 80p per m^3 for water it supplies.

How long would it take to save the cost of building a reservoir?

Show your working.

..... [2]

- (d) The school decides to build a reservoir to collect and store rainwater.

Suggest **four** things this water could be used for without needing extra treatment.

.....

.....

.....

..... [2]

[Total: 7]

- 7 The Rare Breeds Survival Trust (RBST) surveys the numbers of rare breeds each year.

The trust classifies the status of rare breeds.

Some of the categories are shown below:

Category	Cattle	Goats	Pigs	Sheep
1. Critical	Less than 150	Less than 100	Less than 100	Less than 300
2. Endangered	150–250	100–200	100–200	300–500
3. Vulnerable	250–450	200–300	200–300	500–900
4. At Risk	450–750	300–500	300–500	900–1500
5. Minority	750–1500	500–1000	500–1000	1500–3000

- (a) What is the minimum number of pigs for a breed to be considered as 'Endangered'?

..... [1]

- (b) A breed of goat is estimated to have 140 animals.

The breeders want to increase the numbers of this breed by 200%.

What category will the breed be placed in if they are successful?

..... [1]

- (c) Suggest **four** ways that the breeders could increase the numbers of this breed of goat.

.....

.....

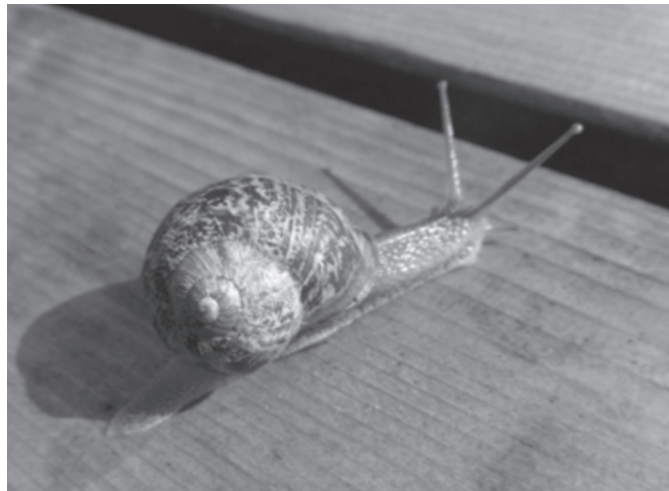
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.....

..... [4]

[Total: 6]

- 8 Snails are common pests of crops.



State **two** adaptations of the snail.

Explain how each adaptation makes the snail a successful crop pest.

Adaptation 1

Explanation

.....

Adaptation 2.....

Explanation

..... [4]

[Total: 4]

10

- 9 Scientists evaluated the effect of four different pesticides that are used to kill snails on crops.

The results are shown below:

Pesticide	Percentages of snails killed by pesticide in each crop				
	Peas	Corn	Cabbages	Grapes	Carrots
Aluminium sulfate	72	68	65	86	74
Iron phosphate	86	97	90	83	88
Metaldehyde	60	85	68	93	53
Methiocarb	65	75	65	84	79

- (a) Which pesticide was the most effective?

..... [1]

- (b) What is the mean percentage of snails killed in the carrot crop?

Answer [2]

- (c) Many people think that iron phosphate is the most 'environmentally friendly' of the four pesticides but it is not always the one used.

Suggest **two** reasons why another of the pesticides might be used instead.

.....

 [2]

[Total: 5]

10 Pesticides must be stored securely.

Suggest **three** different hazards if pesticides are **not** stored securely.

.....

.....

.....

..... [3]

[Total: 3]

- 11** The land-based industries can use a range of alternative energy sources to help meet their energy needs.

Describe the different ways they can do this.



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

..... [6]

[Total: 6]

13

12 What is the main purpose of the Environmental Stewardship scheme?

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<http://publications.naturalengland.org.uk/publication/2798159>

Put a tick (✓) in the box next to the correct statement.

To fund farmers to manage the land in certain ways.

☐

To promote recycling of old farm machinery.

☐

To reduce the amount of CO₂ emitted by vehicles.

☐

To stop the development of new houses on green belt land.

☐

[1]

[Total: 1]

14

13 Farmers spend a lot of time controlling weeds in their crops.



Weeds can reduce both the growth and the value of food crops.

Explain how weeds reduce growth and value, and how farmers can control weeds.



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

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.....

.....

..... [6]

[Total: 6]

END OF QUESTION PAPER

This image shows a blank sheet of white paper designed for writing. It features a series of evenly spaced horizontal blue lines across its entire width. A single vertical red line runs down the left side, creating a narrow margin. The paper is otherwise completely empty, with no text or markings.

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