

Monday 14 January 2013 – Morning

GCSE ENVIRONMENTAL AND LAND-BASED SCIENCE

B681/01 Management of the Natural Environment (Foundation 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	
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Centre number						Candidate number				
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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 live in the soil.



Choose **three** ways in which earthworms help to improve the soil.

- A eat stones in the soil
- B help to mix the soil layers
- C help to compact the soil
- D improve drainage
- E increase activity of soil microbes
- F reduce the number of moles

Answer **A, B, C, D, E** or **F** [3]

2 Different soils contain different particles.

Often, growers will describe a loam as being the best soil type for most crops.

Loam is a balanced mixture of:

- A clay, gravel, sand
- B clay, gravel, silt
- C clay, sand, silt
- D gravel, sand, silt.

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

3 A farm shop has this advert:

Pampered Pigs Farm Shop
Sausages and pork products from our own
outdoor reared pigs

Pigs fed on all natural ingredients, no
artificial additives

We know everything there is to know about
pigs - it's all we do, we produce
nothing else!

Look at the advert.

Explain why this farm may be described as both **organic** and a **monoculture**.

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..... [2]

4 Farmers, growers and gardeners all spend a lot of time and money controlling weeds.

Put ticks (✓) in the boxes next to the **two** best reasons for controlling weeds.

to decrease the numbers of bees

to increase the abundance of pests

to increase the amount of light getting to the crop

to increase biodiversity

to reduce competition for nutrients and water

[2]

5 The RSPB is a wildlife charity.

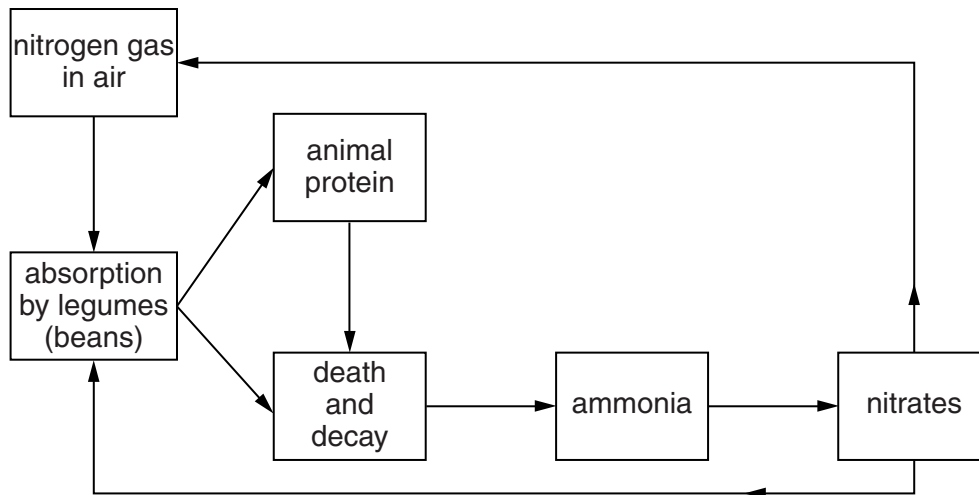


The **main** work of the RSPB is:

- A conservation
- B education
- C legislation
- D relocation.

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

6 The diagram below shows part of the nitrogen cycle.



Write the letter **N** on the arrow where nitrification occurs.

Write the letter **F** on the arrow where nitrogen fixation occurs.

[2]

7 Large machines are often used by farmers.

These machines can compact the soil.



Suggest **two** ways that compaction may damage the **soil**.

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..... [2]

8 A lorry carrying chemicals is involved in an accident.

The chemical spill damages a local beauty spot.

The chemical kills a lot of insects in the area.

This loss of **insects** may affect other animals and plants in the beauty spot.

Describe **two** of these effects.

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..... [2]

9 This piece of apparatus is being used to monitor the temperature of the glasshouse.

The results are recorded on a computer.

The apparatus also sends a message to adjust the ventilation system of the glasshouse.



(a) Give **two** reasons why monitoring and recording the temperature in a glasshouse is important.

1

2

[2]

(b) What is the name of the sensor that monitors the temperature and sends the message to adjust the ventilation?

..... [1]

11 The owners of Sunnybank golf course are looking to reduce costs.

They collect and use rainwater from the buildings.

This reduces the amount of water they use from the mains supply.

(a) Which is likely to be the largest use of water on a golf course?

- A cleaning the patio at the clubhouse
- B washing down the lawn mowers
- C watering the grass on the course
- D watering the hanging baskets

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

(b) Scientists calculate that in summer a golf course can use 40 m^3 of water per hectare per day.

Sunnybank golf course irrigates 60 hectares of land.

How much water will be used on a summer's day?

- A 24 m^3
- B 240 m^3
- C 2400 m^3
- D $24\,000\text{ m}^3$

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

(c) The owners of Sunnybank golf course have built a reservoir which holds $70\,000\text{ m}^3$ of water.

If there is a period of no rain during the summer, how many days would this supply of water last the golf course?

Answer [1]

(d) The owners of Sunnybank golf course already collect and use rainwater from the buildings.

Suggest **three** other ways that the golf course could reduce its water consumption without affecting the look of the course.

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2.....

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3.....

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[3]

12 Egg production in the UK is a mixture of different production systems.

Production system	Percentage of egg-laying hens (%)	Costs of production in pence per dozen	Stocking density in hens per m ²
Caged	50	62.3	13.3
Barn	5	69.9	9.0
Free Range	45	84.7	0.25

(a) Which system produces the eggs at the lowest production cost?

Answer [1]

(b) Which production system is the least crowded?

Answer [1]

(c) It is estimated that there are currently 36 million egg-laying hens in the UK.

How many of these are in intensive production?

Answer [1]

Sales data from last year shows:

Total value of all eggs sold: £868 million

Total number of eggs sold: 933 million dozen.

(d) What is the average selling price for a dozen eggs?

Answer [1]

(e) How much profit per dozen will a farmer using the caged bird system achieve at this average price?

Answer [1]

(f) Imagine that the government decided that all production of eggs would be 'free range'.

What effect would this have on the economics of egg production in the UK?

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..... [3]

13 The picture shows a living windbreak at the edge of an apple orchard.

Apple growers will often include a windbreak in their planting plan.



Describe the **advantages** and **disadvantages** of including windbreaks in the plan for an orchard.

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

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[6]

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