

Candidate forename						Candidate surname					
Centre number						Candidate number					

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**GCSE**

**B493/03**

**ENVIRONMENTAL AND  
LAND-BASED SCIENCE**

**Management of the Natural Environment  
(Foundation Tier)**

**MONDAY 21 MAY 2012: Morning**

**DURATION: 45 minutes  
plus your additional time allowance**

**MODIFIED ENLARGED**

**Candidates answer on the Question Paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Electronic calculator**

**Pencil**

**Ruler (cm/mm)**

**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 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 36.**

**BLANK PAGE**

**Answer ALL the questions.**

- 1 There are three large radio masts at the corner of a farm field.**

**What type of pollution is caused by these masts?**

**A air**

**B noise**

**C smell**

**D visual**

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

**2 Which ONE of these activities is most likely to cause AIR pollution?**

- A burning rubbish on a bonfire**
- B cutting grass with an electric mower**
- C spraying a lawn with weed killer**
- D spreading manure on a garden**

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

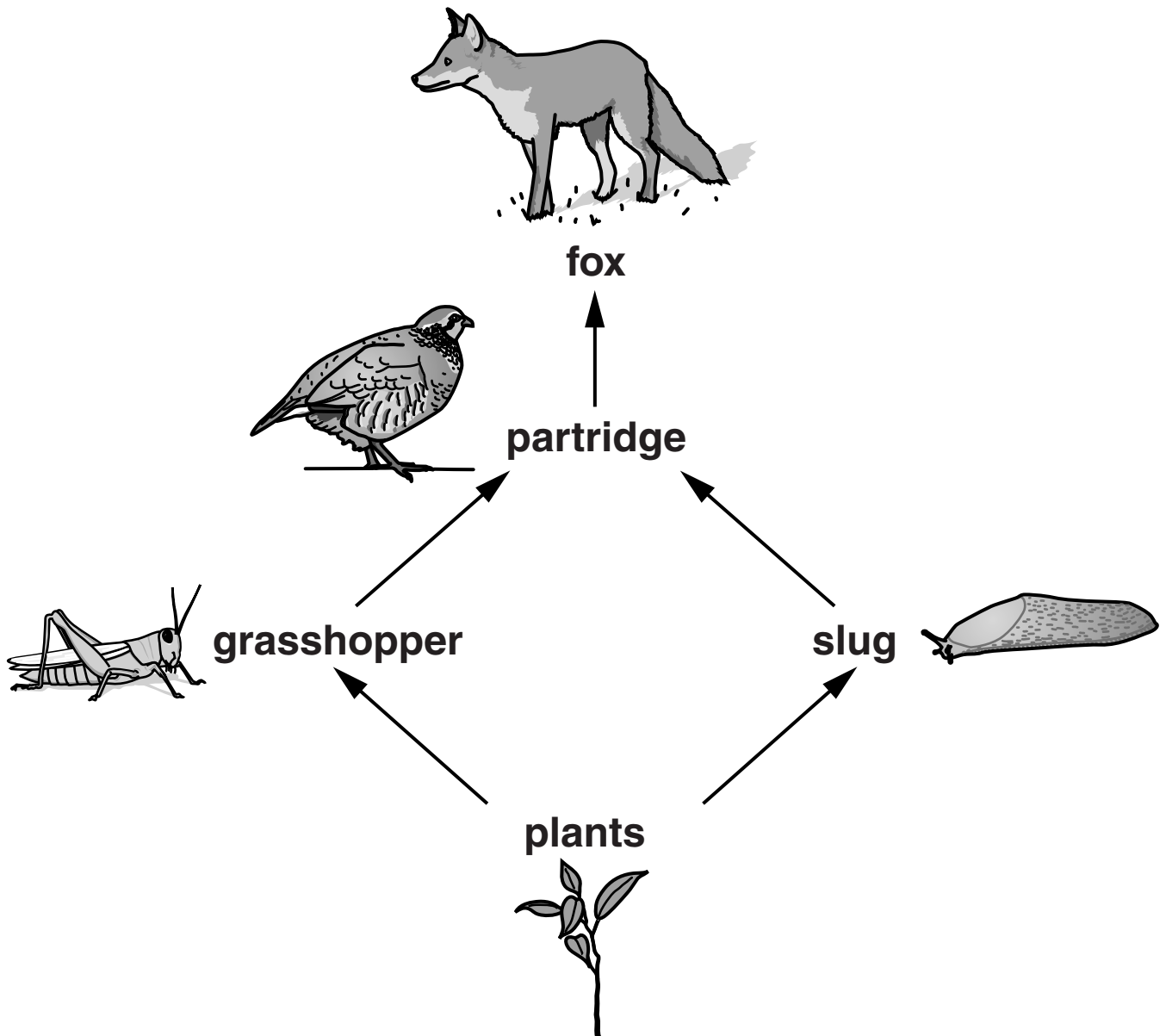
**3 Machines used on farms can be very big and powerful.**

**What is an ADVANTAGE of using larger and more powerful machines?**

- A gateways need to be wider**
- B more fuel is used up**
- C soil is compacted so it drains well**
- D work can be done more quickly**

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

**4 The diagram shows part of a farmland food web.**



**Look at the food web.**

**Draw a straight line to show ONE predator–prey relationship.**

**PREDATOR**

**fox**

**grasshopper**

**partridge**

**slug**

**PREY**

**fox**

**grasshopper**

**partridge**

**slug**

**[2]**

- 5 The amount of energy used in the UK is increasing year by year.**

**There may be an energy shortage because of this.**

**Which would be the most likely reason for this shortage?**

- A Energy being produced in new ways.**
- B People using more electrical equipment.**
- C Power stations becoming more efficient.**
- D Wind turbines being used to make electricity.**

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



- 6 A gardener will grow different plants each year on his allotment.**

**The plants grown each year are shown in the table.**

<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>YEAR 4</b>
<b>sweet corn potatoes</b>	<b>peas beans</b>	<b>cabbages broccoli</b>	<b>parsnips carrots</b>

- (a) In which year are legumes planted?**

**Answer \_\_\_\_\_ [1]**

- (b) Why do gardeners grow legumes?**

- A to add nutrients**
- B to decrease soil pH**
- C to improve drainage**
- D to remove toxins**

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

- 7 Some chemicals are used by farmers to improve the yield of their crops.**

**If these chemicals are not used carefully they can cause harm.**

**Draw THREE lines to connect each CHEMICAL to the HARM IT CAN CAUSE.**

<b>CHEMICAL</b>	<b>HARM IT CAN CAUSE</b>
<div>fertiliser</div>	<div>builds up in food chains, so damaging predators</div>
<div>herbicide</div>	<div>causes excessive plant growth in streams and rivers, so reducing light levels</div>
<div>pesticide</div>	<div>kills some plants needed by animals, so reducing biodiversity</div>
	<div>prevents sunlight reaching leaves, so reducing photosynthesis</div>

**[2]**

**8 Chickens can be farmed intensively.**

**One advantage of intensive farming is that it needs less land than extensive farming.**

**Give TWO OTHER advantages of INTENSIVE farming.**

**1** \_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_ **[2]**

**9 The diagram shows a barn owl.**



**Barn owls feed on small animals such as mice and voles.**

**Give TWO ways the barn owl is adapted for catching mice and voles.**

**1** \_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

\_\_\_\_\_ **[2]**

**10 Farmers can grow crops as MONOCULTURE or MIXED CULTIVATION.**

**(a) What is meant by MIXED CULTIVATION?**

\_\_\_\_\_  
\_\_\_\_\_ [1]

**(b) Give ONE advantage of using mixed cultivation rather than monoculture.**

\_\_\_\_\_  
\_\_\_\_\_ [1]

**11 Soil can be blown away by the wind during the preparation of a field for sowing.**

**Suggest TWO ways that the farmer could reduce soil erosion by the wind.**

**1** \_\_\_\_\_  
\_\_\_\_\_

**2** \_\_\_\_\_  
\_\_\_\_\_

**[2]**

**12 Weeds in a field can be controlled by using chemicals or by using cultural methods.**

**Suggest TWO advantages of using a chemical weed killer.**

**1** \_\_\_\_\_  
\_\_\_\_\_

**2** \_\_\_\_\_  
\_\_\_\_\_

**[2]**

**13 Some students are asked to find the mass of water in a sample of soil.**

**They:**

- 1. weigh an evaporating dish**
- 2. put some soil in the evaporating dish and weigh the dish and soil**
- 3. put the evaporating dish and soil into an oven at 60 °C for two hours**
- 4. reweigh the evaporating dish and soil**
- 5. repeat steps 3 and 4 until the mass does not change**
- 6. calculate the mass of water in the soil.**

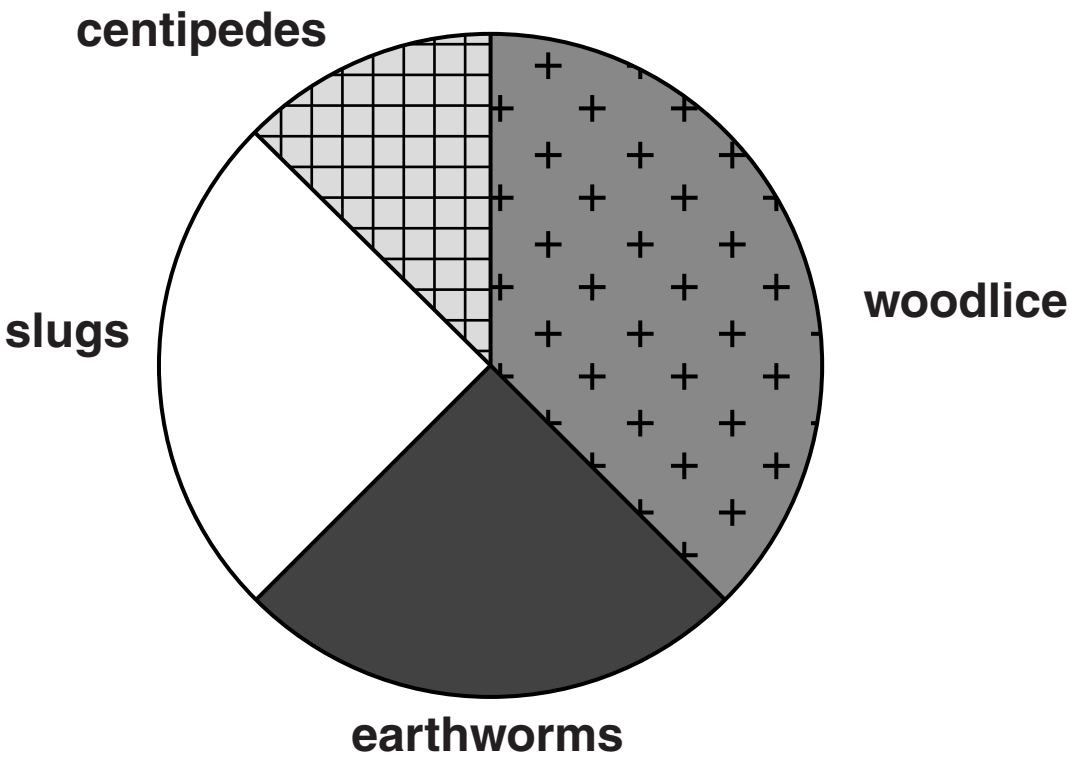
**(a) Explain why step 5 is needed.**

\_\_\_\_\_  
\_\_\_\_\_ [1]

**(b) How can the students calculate the mass of the water in the soil?**

\_\_\_\_\_  
\_\_\_\_\_ [1]

**14 The pie chart shows the relative numbers of some animals in a garden.**



**Use the pie chart to answer the questions.**

**(a) Which animal was found in greatest numbers?**

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

- |            |                          |
|------------|--------------------------|
| centipedes | <input type="checkbox"/> |
| earthworms | <input type="checkbox"/> |
| slugs      | <input type="checkbox"/> |
| woodlice   | <input type="checkbox"/> |

**[1]**



**(b) Which TWO animals were found in equal numbers?**

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

**centipedes**

☐

**earthworms**

☐

**slugs**

☐

**woodlice**

☐

**[1]**

**15 The table shows the total length of managed hedgerows in UK in 1998 and 2007.**

	<b>1998</b>	<b>2007</b>
<b>Length of managed hedgerows</b>	<b>506 584 km</b>	<b>477 000 km</b>

**(a) By how many km had the length of managed hedgerows decreased between 1998 and 2007?**

**Answer** \_\_\_\_\_ **km [1]**

**(b) By what PERCENTAGE had the length of managed hedgerows decreased between 1998 and 2007?**

**A 0.58%**

**B 5.8%**

**C 58%**

**D 94.2%**

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

**16 Acidic soils can be neutralised by putting lime on them.**

**The table shows the recommended amounts of lime (in tonnes per hectare) needed to grow crops in different soils.**

	LIME APPLIED IN TONNES PER HECTARE			
SOIL pH	SANDY LOAM		CLAY LOAM	
	ARABLE	GRASS	ARABLE	GRASS
7.0	0	0	0	0
6.5	3	0	4	0
6.0	6	2	8	3
5.5	9	5	12	6
5.0	12	7	16	7
4.5	15	7	20	7

- (a) A farmer needed to apply 5 tonnes per hectare of lime to grow grass on a field of sandy loam.**

**What was the pH of the soil in this field?**

**Answer** \_\_\_\_\_ **[1]**

- (b) A farmer is growing grass on a clay loam soil of pH 5.5 so needs to apply 6 tonnes per hectare of lime.**

**Describe ONE other situation from the table where the farmer needs to apply 6 tonnes per hectare of lime.**

\_\_\_\_\_  
\_\_\_\_\_ **[1]**

## 17 Fieldwork often needs a lot of equipment.

**A teacher has some equipment she wants to take on a field trip.**



**Suggest THREE hazards she must be aware of when carrying equipment.**

---

---

---

---

**[3]**

**18 Electricity can be generated from different sources.**

**These sources include:**

**WATER**

**WIND**

**CROPS**

**Choose ONE of these sources.**

**SOURCE \_\_\_\_\_**

**Explain how it is used to generate electricity.**

---

---

---

---

**[2]**

**19 A student wants to use ICT to monitor conditions in the school pond.**

**(a) List TWO environmental conditions that could be monitored.**

**1** \_\_\_\_\_

**2** \_\_\_\_\_ **[1]**

**(b) Explain how ICT can be used to monitor environmental conditions.**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ **[2]**

**END OF QUESTION PAPER**

**BLANK 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](http://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.**