



General Certificate of Secondary Education  
2024

Centre Number

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Candidate Number

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# Agriculture and Land Use

Unit 1

Soils, Crops and Habitats



[GAU11]

\*GAU11\*

**THURSDAY 23 MAY, MORNING**

## TIME

1 hour 15 minutes.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page or on blank pages.**

Complete in black ink only. **Do not write with a gel pen.**

Answer **all nine** questions.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 75.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Questions **7** and **9**.



1 The photographs show four priority species in Northern Ireland.

(a) Draw a **line** to match the photograph of each priority species to its name.



Source: © Getty Images



Source: © Getty Images



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**Yellowhammer**

**Barn owl**

**Lapwing**

**Buzzard**

**Curlew**

[4]



DAERA is an agency which is involved in maintaining the rural environment and protecting priority species.

(b) Using your knowledge, complete the sentence below.

**DAERA** stands for the **Department of A** \_\_\_\_\_ ,  
**E** \_\_\_\_\_ and **R** \_\_\_\_\_ **Affairs**. [3]

DAERA often advises farmers on ways to improve biodiversity.

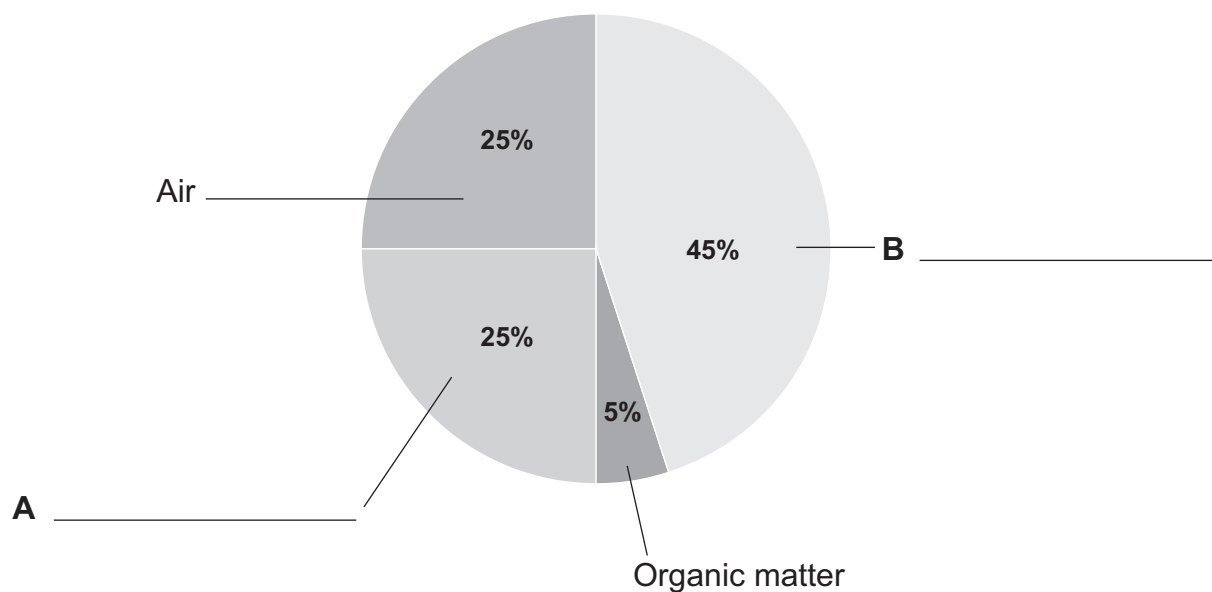
(c) Describe **three** ways farmers can improve biodiversity on their farm.

1. \_\_\_\_\_  
\_\_\_\_\_
  2. \_\_\_\_\_  
\_\_\_\_\_
  3. \_\_\_\_\_  
\_\_\_\_\_
- [3]

[Turn over



2 The pie chart shows the proportions of the main components of a soil.



(a) Label the components **A** and **B** on the pie chart. [2]

(b) The four main types of soil are clay, sandy, peat and loam. Two physical characteristics used to assess soil are drainage and water holding capacity.

(i) Name **one other** physical characteristic of soil.

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

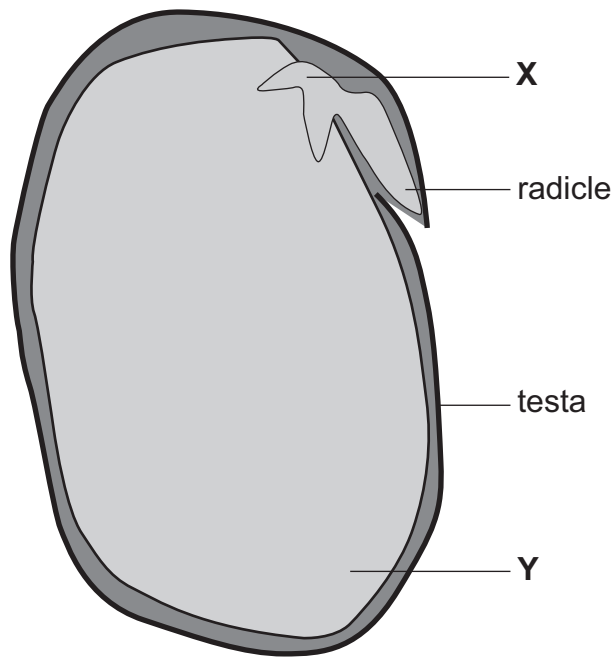
(ii) Which soil type is the **most** desirable to grow crops in?

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





3 The diagram shows the structure of a germinating seed.



Source: Principal Examiner

(a) (i) Name the parts of the seed, **X** and **Y**, labelled in the diagram.

**X** \_\_\_\_\_

**Y** \_\_\_\_\_

[2]

(ii) Describe the function of part **Y**.

\_\_\_\_\_  
\_\_\_\_\_

[1]

(iii) Farmers aim to sow seeds at the correct depth in the soil. Suggest **one** reason why seeds should not be sown too shallow.

\_\_\_\_\_  
\_\_\_\_\_

[1]



After the seed germinates, the plant develops and grows.

**(b)** Describe **one** function of the roots and **two** functions of the stem in a plant.

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

Stem \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]

[Turn over



4 A student investigated photosynthesis in a plant. He destarched the plant and then placed it in sunlight for two days.

(a) Describe how the student destarched the plant.

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

(b) The student removed a leaf from the plant and carried out the starch test.

(i) Name the reagent he used to test the leaf for starch.

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

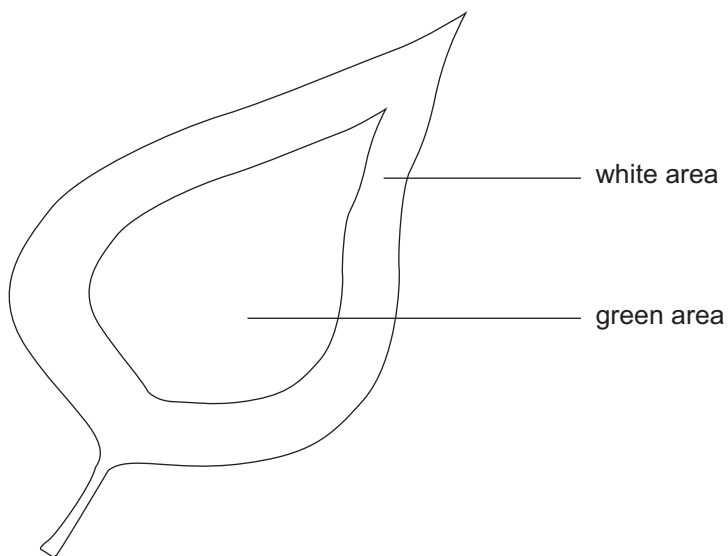
(ii) Give the colour change in the reagent when starch is present.

\_\_\_\_\_ to \_\_\_\_\_ [2]



(c) The student repeated the investigation using a **variegated** plant.

The diagram shows a variegated leaf from this plant.



(i) On the diagram, shade the area of the leaf where starch would be present after the plant was placed in sunlight for two days. [1]

(ii) Explain why starch was present in the area you shaded.

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[2]

[Turn over



5 Grass provides grazing for a wide range of farm animals.

(a) Outline a method to estimate the amount of grass in a field.

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[3]

(b) Weeds, such as dandelions, can reduce the yield of crops such as grass.

State **one other** common weed in Northern Ireland.

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[1]

(c) Complete the following sentence about grass preservation.

Grass can be harvested and preserved as hay or

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[1]

Farmers may reseed fields after several years.

(d) Describe how a farmer would prepare the seedbed before sowing the grass seed.

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[3]





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**[Turn over**



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- 6 (a) Agriculture is an energy intensive industry. A survey of dairy farms was carried out to find the electricity consumption per litre of milk produced.

The results are shown in the table.

Item of energy usage	Electricity consumed /Wh L <sup>-1</sup>
milk cooling	13.2
water heating	9.8
milking	8.4
lighting	1.4
water pumping	2.2
other	7.4
<b>Total</b>	<b>42.4</b>

- (i) Calculate the **percentage** of total electricity consumed in **cooling** one litre of milk.

Give your answer to the **nearest whole number**.

**Show your working.**

\_\_\_\_\_ % [4]



(ii) Use the table to complete the bar chart of **Electricity consumed /Wh L<sup>-1</sup>** against **Item of energy usage**. Choose a suitable scale and label for the y-axis.



[4]

[Turn over



Farmers are actively trying to reduce their carbon footprint.

**(b)** Describe **two** ways farmers can reduce their carbon footprint.

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

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





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**[Turn over**



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8 Soil contains millions of bacteria that are part of the nitrogen cycle.

(a) Using your knowledge of the nitrogen cycle, describe the role of **nitrifying** bacteria.

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[2]

The table shows the numbers of some types of bacteria in samples from three different soils, **A**, **B**, and **C**.

The samples of soil were of equal mass.

Type of bacteria	Number of bacteria /millions		
	Soil A	Soil B	Soil C
denitrifying	700	100	90
nitrogen-fixing	80	500	100



(b) Using the information in the table, select the soil, **A**, **B** or **C**, which a farmer would **not** want to use to grow a successful crop.

Explain your answer.

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

Explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [3]

[Turn over







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<b>For Examiner's use only</b>	
<b>Question Number</b>	<b>Marks</b>
1	
2	
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5	
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7	
8	
9	
<b>Total Marks</b>	

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