



Rewarding Learning

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

MV18

[GAU11]

THURSDAY 23 MAY, MORNING

Time

1 hour 15 minutes, plus your additional time allowance.

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 on blank pages.

Complete in black ink only.

Answer **all nine** questions.

Information for Candidates

The total mark for this paper is 75.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in

Questions **7** and **9**.

An insert has been provided for question 6(a)(ii).

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. [4 marks]



Yellowhammer



Barn owl



Lapwing



Buzzard

Curlew

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

(b) Using your knowledge, complete the sentence below.
[3 marks]

DAERA stands for the **Department** of

A _____ ,

E_____ and

R_____ **Affairs**.

DAERA often advises farmers on ways to improve biodiversity.

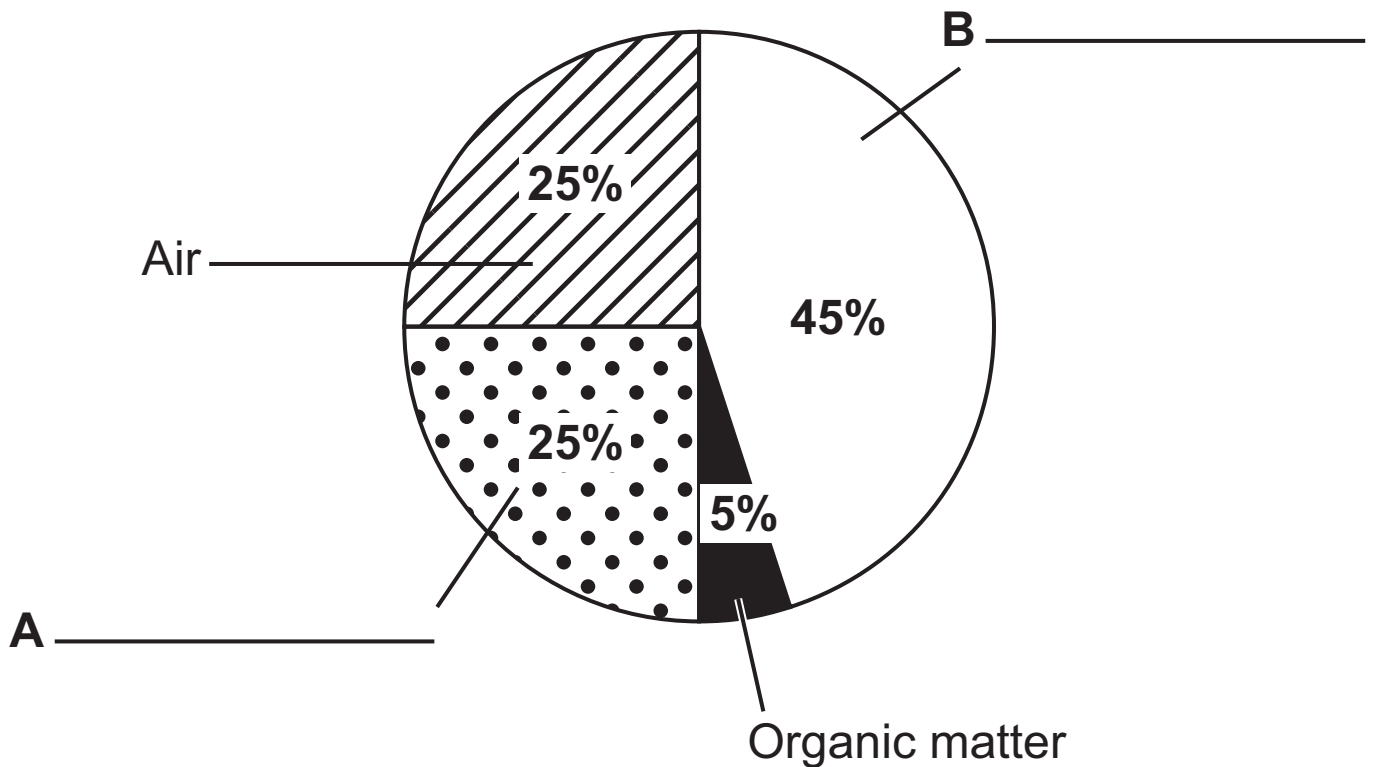
(c) Describe **three** ways farmers can improve biodiversity on their farm. [3 marks]

1. _____

2. _____

3. _____

- 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 marks]

- (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.

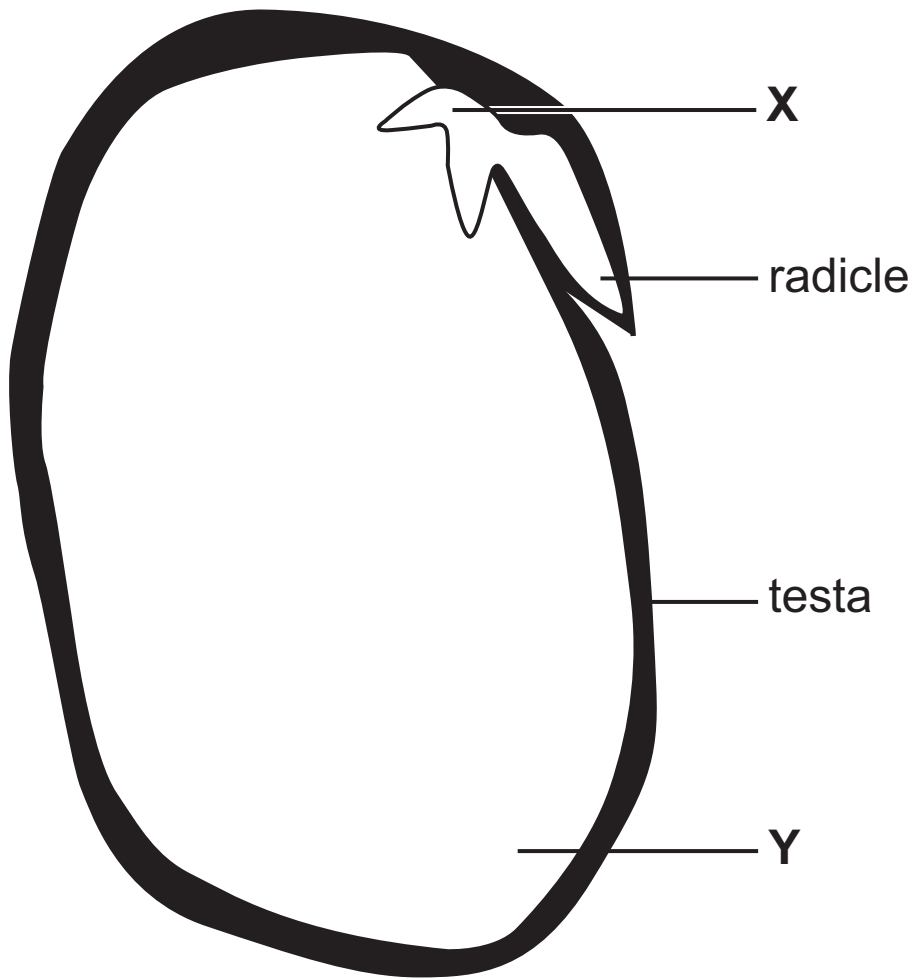
- (i) Name **one other** physical characteristic of soil.
[1 mark]
-

(ii) Which soil type is the **most** desirable to grow crops in? [1 mark]

The organic matter content of soil is often used by farmers to assess soil quality.

(c) Describe an experiment to measure the **organic matter** content of a **dry** soil sample. [4 marks]

3 The diagram shows the structure of a germinating seed.



(a) (i) Name the parts of the seed, **X** and **Y**, labelled in the diagram. [2 marks]

X _____

Y _____

(ii) Describe the function of part **Y**. [1 mark]

(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 mark]

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.

[1 mark for roots and 2 marks for stem]

Roots _____

Stem _____

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 marks]

(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.

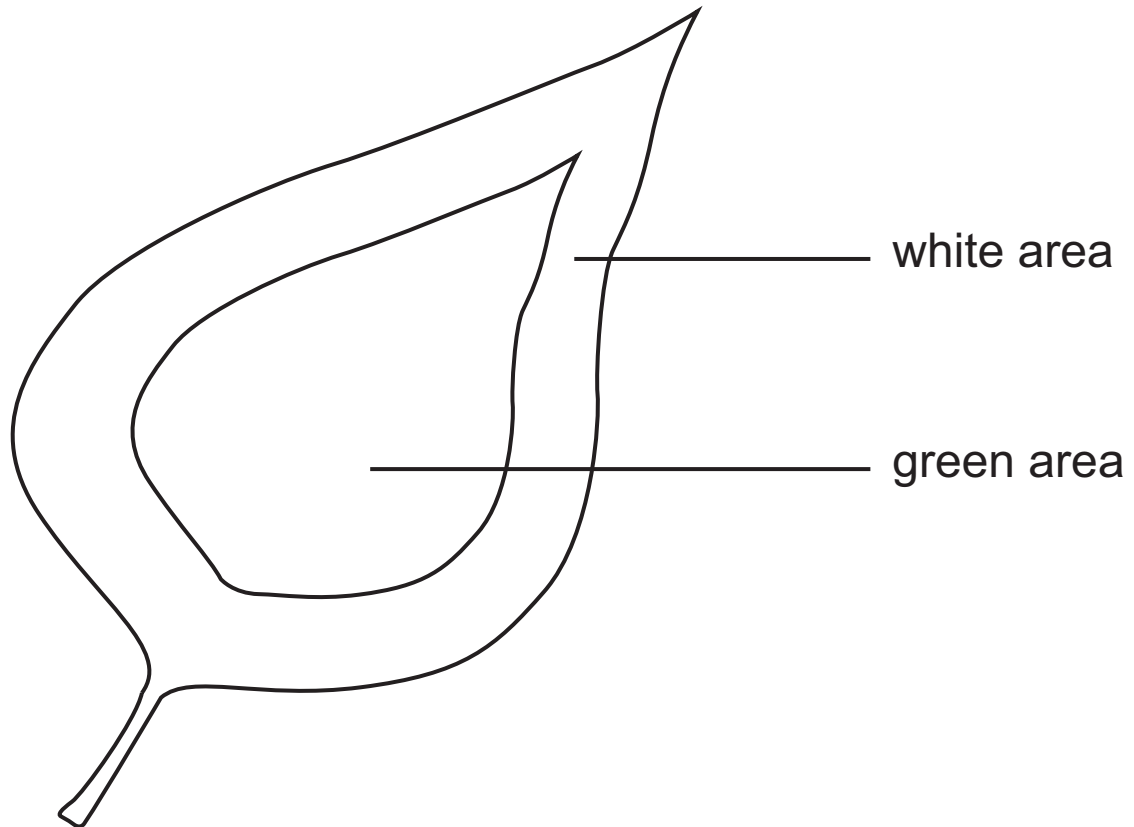
[1 mark]

(ii) Give the colour change in the reagent when starch is present. [2 marks]

_____ to _____

(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 mark]

(ii) Explain why starch was present in the area you shaded. [2 marks]

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

(a) Outline a method to estimate the amount of grass in a field. [3 marks]

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

State **one other** common weed in Northern Ireland.
[1 mark]

(c) Complete the following sentence about grass preservation. [1 mark]

Grass can be harvested and preserved as hay or

Farmers may reseed fields after several years.

(d) Describe how a farmer would prepare the seedbed before sowing the grass seed. [3 marks]

- 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 ⁻¹
milk cooling	13.2
water heating	9.8
milking	8.4
lighting	1.4
water pumping	2.2
other	7.4
Total	42.4

- (i) Calculate the **percentage** of total electricity consumed in **cooling** one litre of milk. [4 marks]

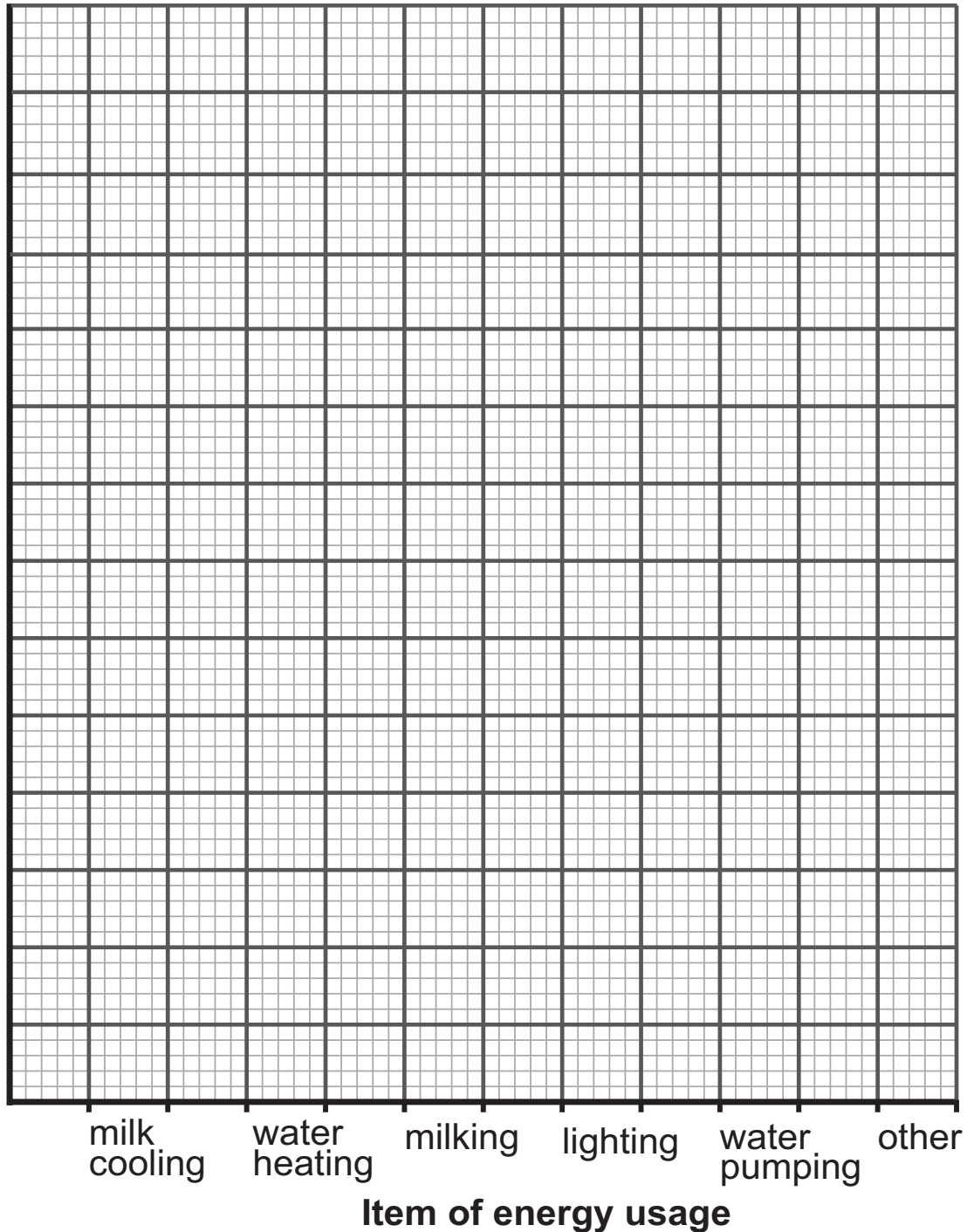
Give your answer to the **nearest whole number**.

Show your working.

_____ %

- (ii) Use the table to complete the bar chart of **Electricity consumed /Wh L⁻¹** against **Item of energy usage**. Choose a suitable scale and label for the y-axis. [4 marks]

An insert of the graph below has been provided for clarity.



Farmers are actively trying to reduce their carbon footprint.

(b) Describe **two** ways farmers can reduce their carbon footprint. [2 marks]

1. _____

2. _____

Blank Page

(Questions continue overleaf)

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. [2 marks]

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. [1 mark]

Explain your answer. [3 marks]

Soil _____

Explanation _____

This is the end of the question paper

SOURCES

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Q3 © *Principal Examiner*

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Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

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Insert to use with question 6(a)(ii)

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- (ii) Use the table on page 12 to complete the bar chart of **Electricity consumed /Wh L⁻¹** against **Item of energy usage**. Choose a suitable scale and label for the y-axis. [4 marks]

