



General Certificate of Secondary Education  
2023

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 1 JUNE, AFTERNOON**

## 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 **6** and **9**.



1 The photographs below show a selection of common plants in Northern Ireland.

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



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**Nettle**

**Timothy**

**White  
clover**

**Chickweed**

**Cocksfoot**

[4]



(b) Weeds reduce crop productivity by competing with crops for abiotic factors.

(i) Define the term abiotic factor.

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[1]

(ii) State **two** abiotic factors for which weeds and crops compete.

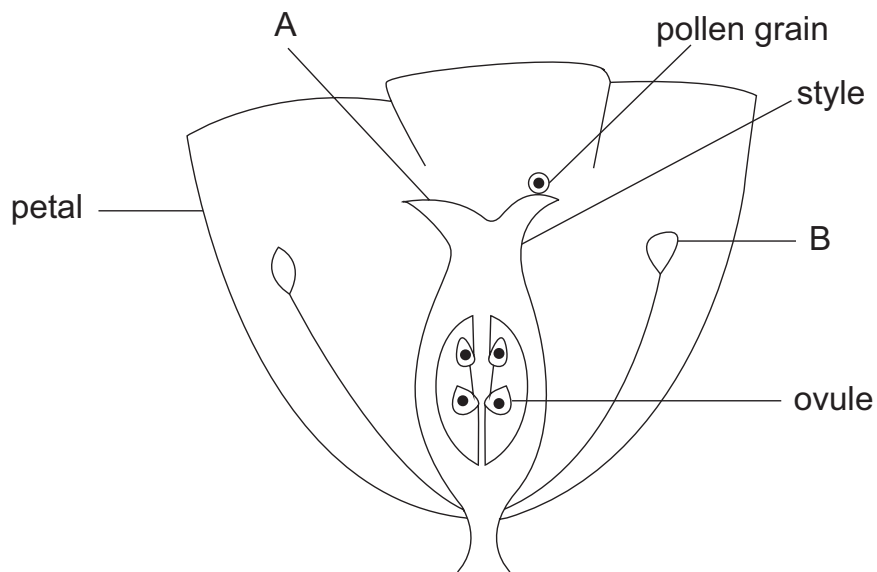
1. \_\_\_\_\_

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

[2]



2 (a) The diagram below shows an insect pollinated flower.



Source: Chief Examiner

(i) Name the parts of the flower, labelled A and B, in the diagram above.

A \_\_\_\_\_

B \_\_\_\_\_

[2]

(ii) Describe the function of the petals.

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

[1]



(b) State **three** ways in which wind pollinated flowers differ from insect pollinated flowers.

Make clear which type of flowers you are referring to in your answer.

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

\_\_\_\_\_

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

\_\_\_\_\_

3. \_\_\_\_\_

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

(c) After pollination, fertilisation occurs in the flower.

Complete the following paragraph to describe the process of fertilisation.

Choose from the words in the box.

nucleus	cytoplasm	ovary	bud
seed	male gamete	pollen tube	filament

A pollen grain is transferred to the flower. A \_\_\_\_\_

\_\_\_\_\_ grows down the style and the \_\_\_\_\_ of

the pollen grain passes into the \_\_\_\_\_. Here the ovule

becomes fertilised to form a \_\_\_\_\_.

[4]

[Turn over



- (d) Bees are important insects for the pollination of flowers. In recent years an effort has been made to increase the bee population.

In 2016, an estimated **223,000** beehives were recorded in the UK and this increased to **247,000** in 2017.

- (i) Calculate the **percentage increase**, to one decimal place, in the number of beehives from 2016 to 2017.

**Show your working.**

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

- (ii) Apart from more beehives, suggest **one** way in which farmers can help increase the bee population.

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





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**3** Maize is grown as a forage crop in Northern Ireland.

Fertilisers are added to increase the nutrients available to maize.

The photograph below is part of a label from a fertiliser bag.



**(a)** What do the numbers on the fertiliser bag represent?

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

A farmer notices that the maize grown on his farm has slow growth and yellow leaves.

**(b)** In which essential nutrient is the maize deficient?

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

**(c)** What is the job title of a person who advises farmers on fertiliser use?

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



(d) The addition of fertiliser can cause the pH of the soil to become acidic.

(i) Suggest the pH value of a slightly acidic soil.

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

(ii) What can farmers add to the soil to reduce acidity?

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

(e) Aeration is important in maintaining soil fertility and increasing crop growth.

(i) Using your knowledge of the **nitrogen cycle**, explain how aeration of the soil results in increased crop growth.

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

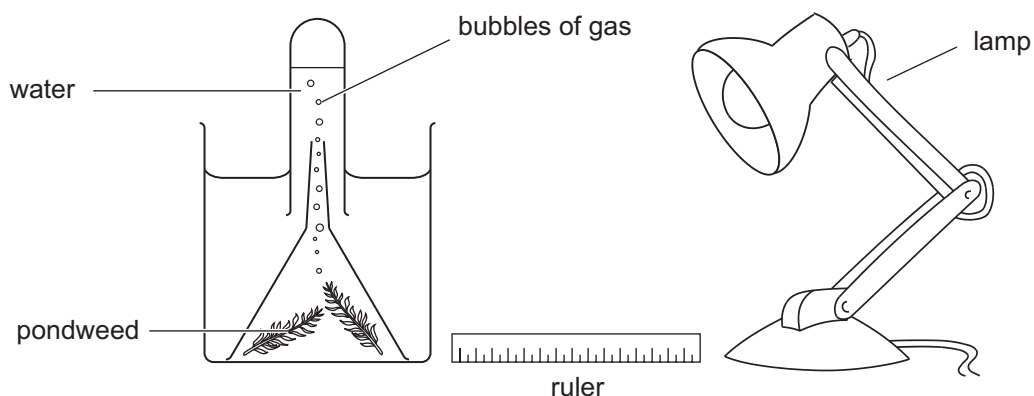
(ii) Suggest how a farmer could increase the aeration of the soil.

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

[Turn over



4 The diagram below shows apparatus used in a photosynthesis experiment.



Source: Principal Examiner

The lamp was placed at different distances from the pondweed and the number of bubbles of gas per minute was counted.

(a) Name the gas produced by photosynthesis.

\_\_\_\_\_

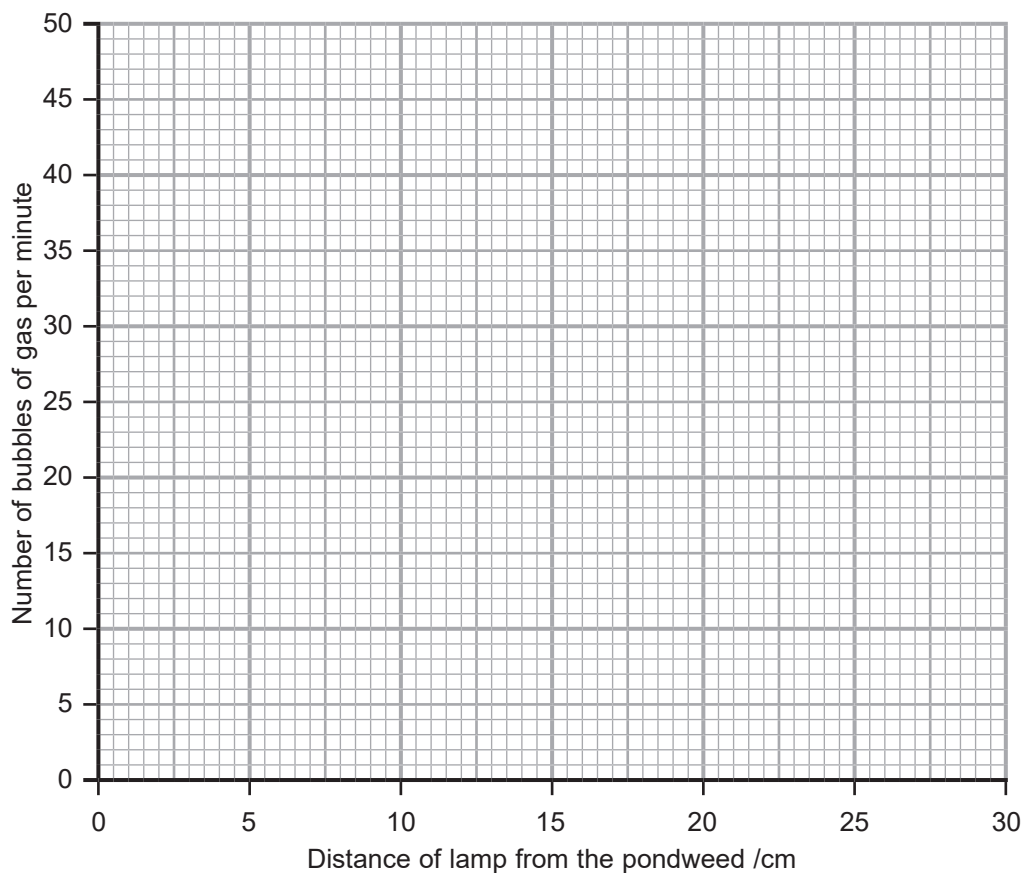
[1]

(b) The results of the experiment are shown below.

Distance of the lamp from the pondweed /cm	Number of bubbles of gas per minute
5	45
10	36
15	20
20	8
25	8



(i) On the grid below, complete a line graph by plotting the results given in the table.



[3]

(ii) Describe and explain the results of this experiment.

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[2]

[Turn over

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- 5 (a) The photograph below shows pak choi grown commercially in a **polytunnel** in Northern Ireland. It is commonly used in salads and stir-fries.



Source: Principal Examiner

The pak choi is grown in a nutrient solution **without** soil.

- (i) Name the technique used to grow plants **without** soil.

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

- (ii) Which one of the following crops would be most suitable to be grown **without** soil? Circle the correct answer.

lettuce

apple

melon

[1]

- (b) A polytunnel is a type of protected cultivation.

- (i) Name **another** type of protected cultivation.

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



(ii) Using the photograph and your knowledge, give **two** advantages and **two** disadvantages of growing crops using protected cultivation.

Advantages

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_ [2]

Disadvantages

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_ [2]

[Turn over

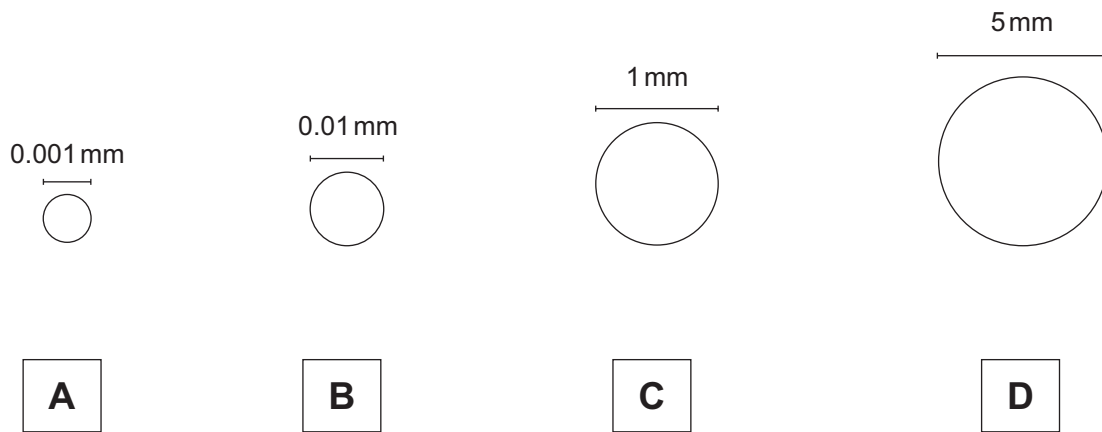








The diagram below shows the sizes of different particles that make up soils.



(c) Suggest which particle size, **A**, **B**, **C** or **D**, has the highest percentage in clay soil.

\_\_\_\_\_

[1]

[Turn over



- 8 The Marsh Fritillary butterfly is a priority species in Northern Ireland and is shown in the photograph.



© Getty Images

- (a) What is a priority species?

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

- (b) Name **one** other priority species in Northern Ireland.

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

- (c) Name the common habitat for a Marsh Fritillary butterfly.

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



An Area of Special Scientific Interest (ASSI) is an area established to conserve nature.

**(d)** Describe how being in an ASSI affects priority species.

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[2]







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<b>For Examiner's use only</b>	
<b>Question Number</b>	<b>Marks</b>
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2	
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5	
6	
7	
8	
9	
<b>Total Marks</b>	

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