



Rewarding Learning

General Certificate of Secondary Education
2017

Centre Number

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Candidate Number

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Agriculture and Land Use

Unit 1
Soils, Crops and Habitats



GAL11

[GAL11]

FRIDAY 26 MAY, 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.

Write your answers in the spaces provided in this question paper.

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.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	

Total Marks	
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1 (a) Look at the photographs below of common plants used in hedging in Northern Ireland. Identify the plants shown in each photograph.

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



© CCEA

Hawthorn



© CCEA

Holly



© CCEA

Oak



Source: Chief Examiner

Hazel

Dog Rose

Examiner Only	
Marks	Remark

[4]

(b) Suggest **one** benefit to livestock of having hedges.

[1]

Examiner Only	
Marks	Remark

2 (a) Apples are an important perennial crop grown in County Armagh.

Explain what is meant by a **perennial** plant.

[1]

(b) Apple trees like all crops are affected by biotic factors.



© Matauw / iStock / Thinkstock

(i) Define the term **biotic**.

[1]

(ii) Name **two** biotic factors that can affect crops.

1. _____
2. _____

[2]

Examiner Only	
Marks	Remark

- 3 (a) Over 15% of Northern Ireland's agricultural land is used for growing wheat. It can be sown in winter or spring.



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Spring wheat is sown in early spring and harvested approximately 7 months later. Winter wheat is sown in late autumn and harvested approximately 10 months later.

In a study the yields of wheat were recorded over three years. The results from the study are shown in the table below.

	Yield in tonnes/hectare	
	Spring wheat	Winter wheat
Year 1	7.0	11.0
Year 2	6.5	4.5
Year 3	7.5	11.5
Average yield	7.0	

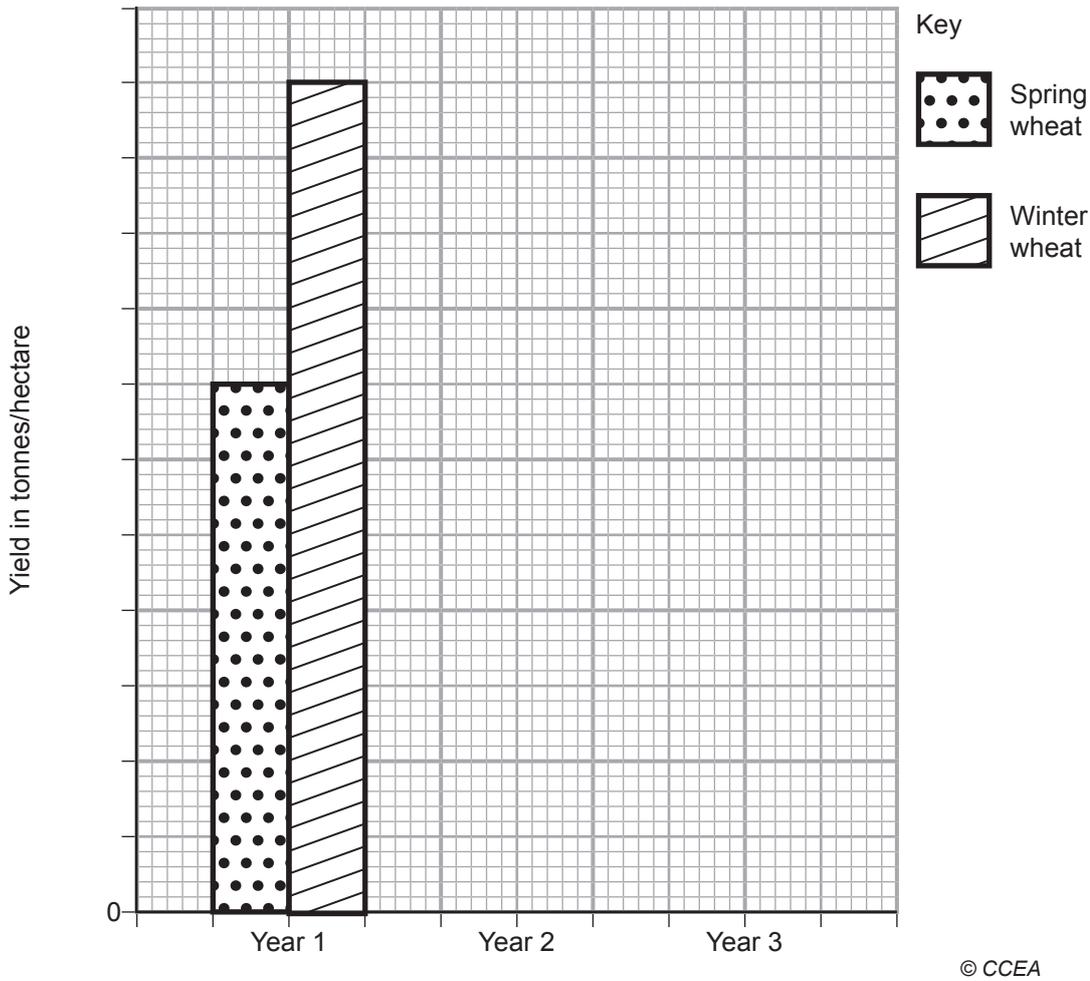
- (i) Complete the table above by calculating the **average** yield in the table for winter wheat.
Show your working.

_____ [1]

- (ii) Calculate the **difference** in the yield of spring wheat and winter wheat for **Year 1**.
Include the **unit**.

_____ [2]

(b) Below is an incomplete bar chart showing the yields of wheat.



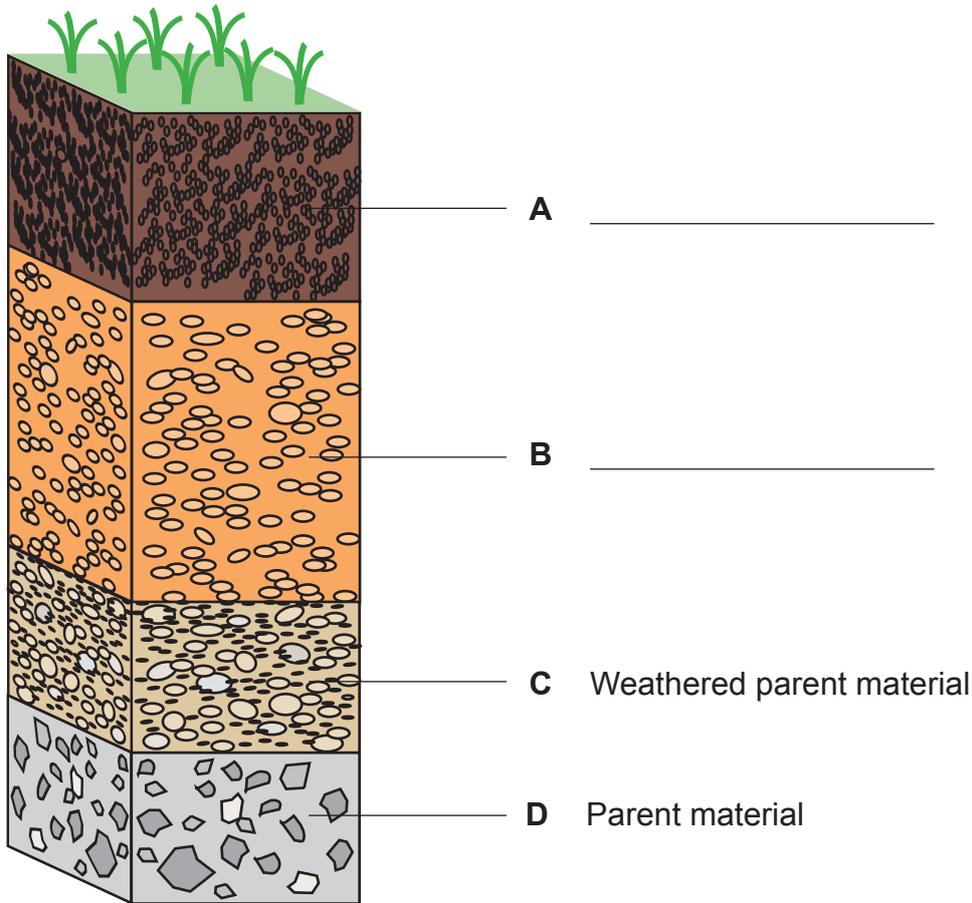
Complete the bar chart using the information in the table on page 6. Include a suitable scale and correct shading. [4]

(c) Using your knowledge and the information above, give **two** reasons why a farmer might decide to grow spring wheat instead of winter wheat.

1. _____
 - _____
 2. _____
 - _____
- [2]

Examiner Only	
Marks	Remark

4 (a) The diagram below shows a soil profile.



© CCEA

(i) Label the horizons **A** and **B** on the diagram above. [2]

(ii) Which horizon **A**, **B**, **C** or **D**, contains the most organic matter?
 _____ [1]

(iii) Roots from some crops can grow as deep as 40 cm into the soil.

List **two** functions of a root.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

- (b) (i) Using heavy machinery is one of the main causes of soil compaction. This reduces the air spaces between soil particles leading to less productive growing conditions.

Suggest **two** ways a farmer can reduce soil compaction when using heavy machinery.

1. _____

2. _____

[2]

- (ii) State **one** way a farmer can improve soil which is already compacted.

_____ [1]

- (c) Most crops prefer a soil with neutral pH.

(i) What pH value is neutral? _____ [1]

(ii) What is added to soil to reduce acidity?

_____ [1]

Examiner Only

Marks

Remark

- 5 (a) Using your knowledge, complete the sentences below.

Choose words from the list.

Sand Lettuce Manure Potatoes Soil Water

Most crops around the world are grown in _____.

Hydroponics involves growing plants in _____.

Hydroponics is commonly used to grow _____ and is rarely used to grow _____.

[4]

- (b) Strawberries can be grown both indoors and outdoors in Northern Ireland. The picture below shows strawberries growing in a glasshouse.



© RuudMorijn / iStock / Thinkstock

- (i) A glasshouse is a form of protected cultivation. Give **one** other method of protected cultivation.

_____ [1]

Examiner Only	
Marks	Remark

- (ii) Give **two** advantages and **two** disadvantages of growing crops under protected cultivation.

Advantages

1. _____

2. _____
 _____ [2]

Disadvantages

1. _____

2. _____
 _____ [2]

- (c) Strawberries require a range of nutrients which can be provided by fertilisers.

A typical strawberry fertiliser contains:

Nitrogen	Phosphorus	
4	5	5

- (i) Complete the table above to show the name of the missing nutrient. [1]

- (ii) State what the numbers on the above table represent.

_____ [1]

Examiner Only

Marks Remark

6 High quality silage is an important winter feed for dairy cows.



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(a) (i) Describe **three** ways you could assess silage quality on the farm **without** specialist equipment.

1. _____

2. _____

3. _____

_____ [3]

(ii) State **one** difference between hay and silage.

_____ [1]

Examiner Only	
Marks	Remark

- (b) (i) The silage could also be tested in the laboratory to determine the Dry Matter content.

The steps carried out are listed below.

- A Record mass of dry sample
- B Calculate % Dry Matter
- C Collect several samples of silage
- D Record mass of fresh sample
- E Place in oven at 105°C and heat until a constant mass.

Place these steps in order. The **first** one has been done for you.

C _____ [2]

- (ii) Why is the sample heated to a constant mass in Step **E**?

 _____ [1]

- (iii) Calculate the % Dry Matter using the following information.
 Show your working.

Mass of fresh sample = 150 g

Mass of dry sample = 54 g

_____ % [2]

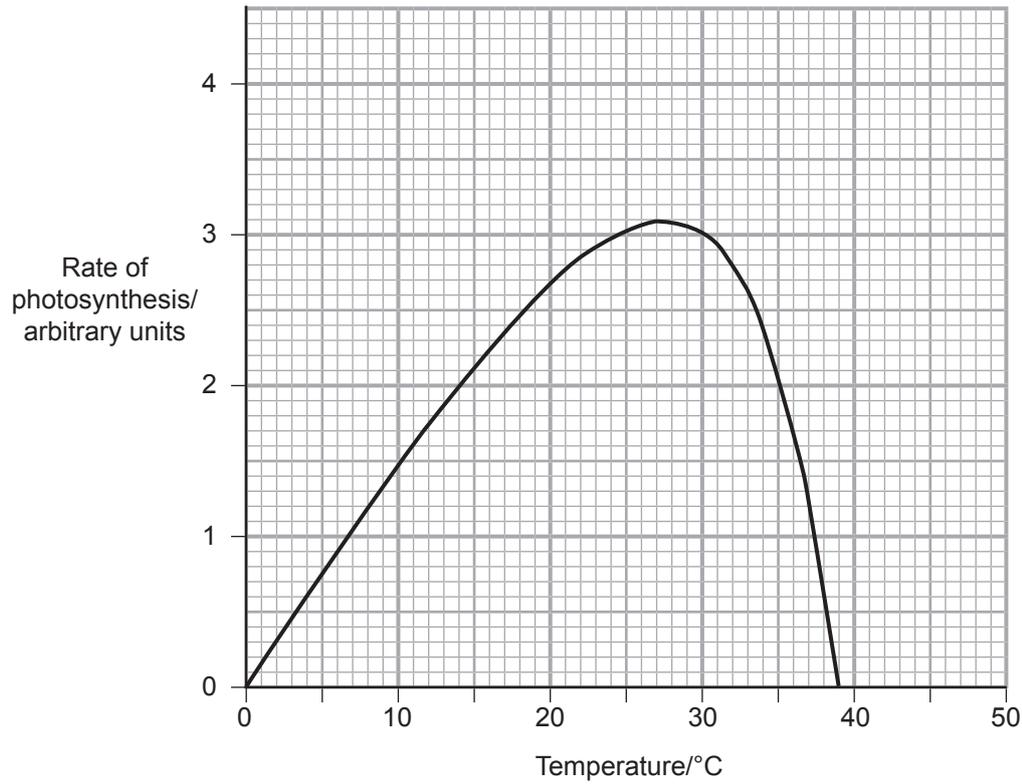
Examiner Only	
Marks	Remark

[9]

Examiner Only	
Marks	Remark

8 Photosynthesis is the process by which a plant makes food.

The graph below shows how the rate of photosynthesis is affected by temperature.



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(a) Using data from the graph describe the trend shown.

[3]

Examiner Only	
Marks	Remark

(b) Name **two** other factors that affect the rate of photosynthesis.

1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

[9]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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