



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**AGRICULTURE**

**0600/11**

Paper 1

**October/November 2013**

**1 hour 45 minutes**

Candidates answer Section A on the Question Paper.

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or graphs.

Do not use staples, paper clips, highlighters, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Electronic calculators may be used.

**Section A**

Answer **all** questions.

Write your answers in the spaces provided on the Question Paper.

You are advised to spend no longer than 1 hour on Section A.

**Section B**

Answer any **two** questions.

Write your answers on the Answer Booklet/Paper provided.

Enter the numbers of the Section B questions you have answered in the grid below.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
<b>Section A</b>	/
1	
2	
3	
4	
5	
6	
7	
8	
9	
<b>Section B</b>	/
<b>Total</b>	

This document consists of **22** printed pages and **2** blank pages.



Section A

Answer all the questions.

1 (a) Fig. 1.1 shows three hand tools used to construct a wooden gate.

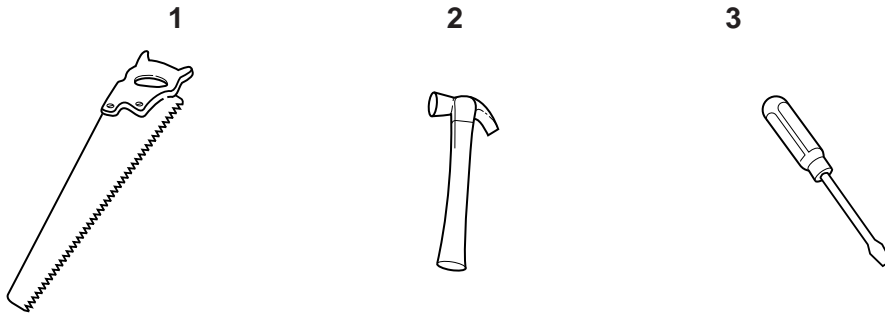


Fig. 1.1

State the use of each tool in making the gate.

tool 1 .....

tool 2 .....

tool 3 ..... [3]

(b) Two farm buildings were constructed using the materials shown in Table 1.1.

Table 1.1

	building A	building B
walls	brick	wood
floor	concrete	earth
roof	iron sheets	thatch

(i) State and explain which building will stay cooler in very hot weather.

building .....

explanation .....

.....

..... [2]

(ii) State and explain which building would be more durable (long-lasting).

building .....

explanation .....

.....

.....

..... [2]

**[Total: 7]**

*For  
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Use*

- 2 (a) Fig. 2.1 shows the tasks that should be carried out when cleaning a livestock house before re-stocking it.

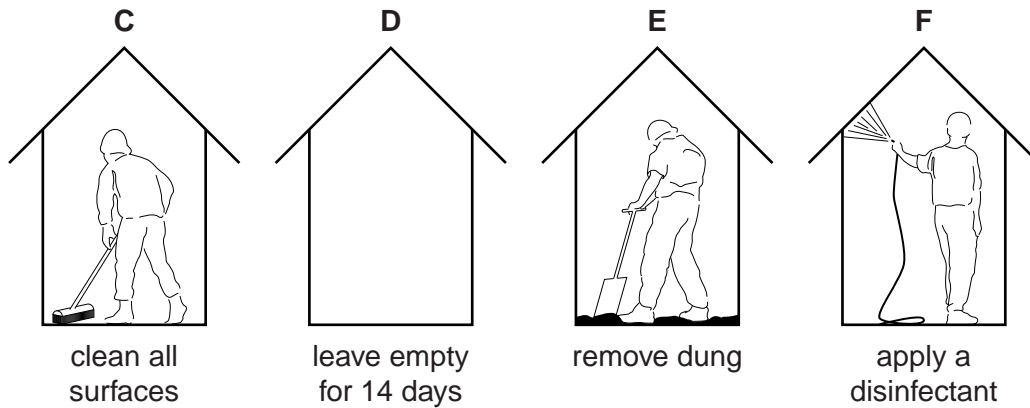


Fig. 2.1

List the letters to show the order in which the tasks should be carried out.

..... [1]

- (b) For a named type of farm livestock, state three signs that show that an animal is in good health.

type of livestock .....

signs of good health

1 .....

2 .....

3 ..... [3]

- (c) State three actions that should be taken when an outbreak of disease is suspected.

1 .....

.....

2 .....

.....

3 .....

..... [3]

[Total: 7]

- 3 (a) Fig. 3.1 shows a series of actions taken to maintain a metal spade after it has been used for digging.

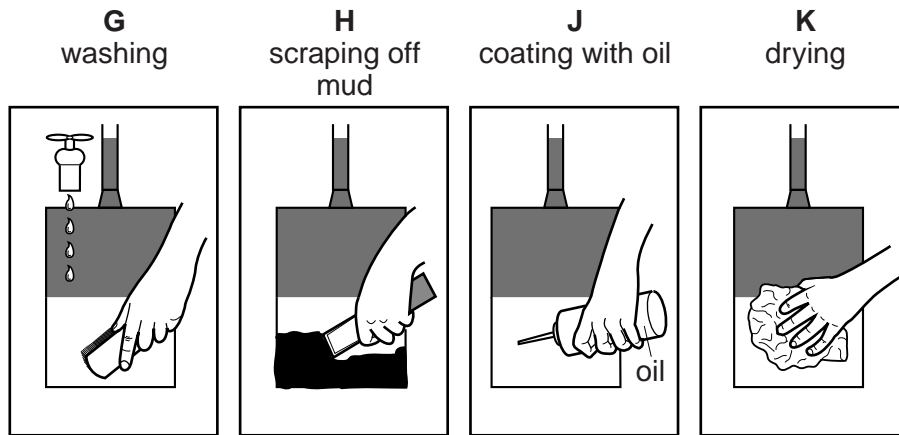


Fig. 3.1

- (i) List the letters to show the order in which the tasks should be carried out.

.....

[1]

- (ii) Explain the reasons for the following actions

scraping off mud, .....

.....  
.....

coating with oil. ....

.....  
..... [3]

- (b) Tools such as spades often have wooden handles.

State two ways in which the handle can be maintained.

1 .....

2 ..... [2]

[Total: 6]

- 4 (a) (i) Fig. 4.1 shows the stomach of a ruminant animal.

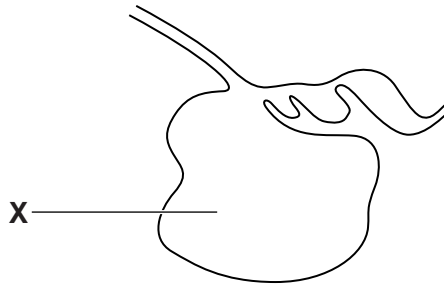


Fig. 4.1

The letters **L**, **M**, **N** and **P** show possible functions for structure **X**.

- L** cellulose broken down by bacteria
- M** food regurgitated to mouth
- N** protein digestion begins
- P** water absorbed

What is the function of **X**?

Answer **L**, **M**, **N** or **P** ..... [1]

- (ii) Nutrients in an animal's diet are digested into simple substances. These have various functions in the body.

Complete Table 4.1 with the nutrient, the product of digestion and the function in the body.

The first row has been done for you.

Table 4.1

nutrient in food	product of digestion	function in the body
fat	fatty acids and glycerol	energy and warmth
starch		
	amino acid	

[4]

- (b) *Concentrates* are animal feedstuffs that have a high food value in relation to their bulk. Cattle used for milk production may be given a concentrate rich in protein, to supplement their grazing.

Table 4.2 compares the concentrate requirements, for different levels of daily milk production, in cattle on good and poor pasture.

**Table 4.2**

milk produced /litres	concentrate required with good pasture /kg	concentrate required with poor pasture /kg
5	0	1
10	3	4
15	5	7

- (i) Using the information in Table 4.2, explain the advantages of good pasture in commercial milk production.

.....

.....

.....

..... [2]

- (ii) State three ways in which pasture can be improved.

1 .....

.....

2 .....

.....

3 .....

..... [3]

**[Total:10]**

- 5 (a) Fig. 5.1 shows a section through a bean flower.

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Use

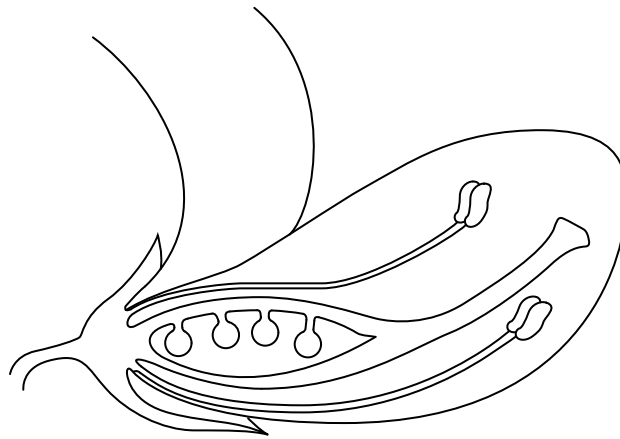
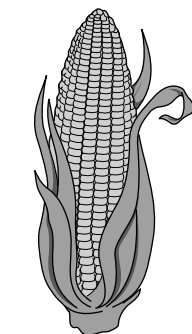


Fig. 5.1

On Fig. 5.1

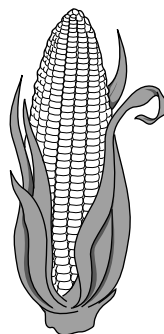
- (i) use letter **Q** and a label line to label a structure that produces pollen,  
 (ii) use letter **R** and a label line to label an ovule. [2]

- (b) Fig. 5.2 shows two maize cobs. One has yellow grains and the other has white grains. The colours are controlled by alleles.



**Yy**

yellow grains



**yy**

white grains

**Y** = allele for yellow grains  
**y** = allele for white grains

Fig. 5.2

- (i) What is the correct definition of an *allele*?

- S** a cell nucleus  
**T** a chromosome  
**U** a reproductive cell  
**W** an alternative form of a gene

Answer **S, T, U** or **W** ..... [1]



(ii) Using the information in Fig. 5.2, explain what is meant by the terms

*genotype*, .....

.....

.....

.....

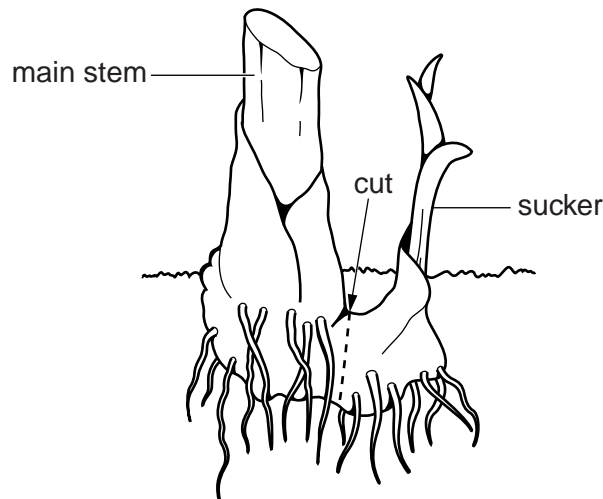
*phenotype*. .....

.....

.....

..... [4]

(c) Fig. 5.3 shows the method for propagating banana plants.



**Fig. 5.3**

Bananas do not produce viable seed so a new plant is produced by cutting and planting a section of a mature plant, called a sucker.

What is the name of this type of reproduction?

..... [1]

**[Total: 8]**

**QUESTION 6 STARTS ON PAGE 11**

- 6 (a) Fig. 6.1 shows the relationship between the number of weeds per square metre in a cereal crop and the loss in percentage yield.

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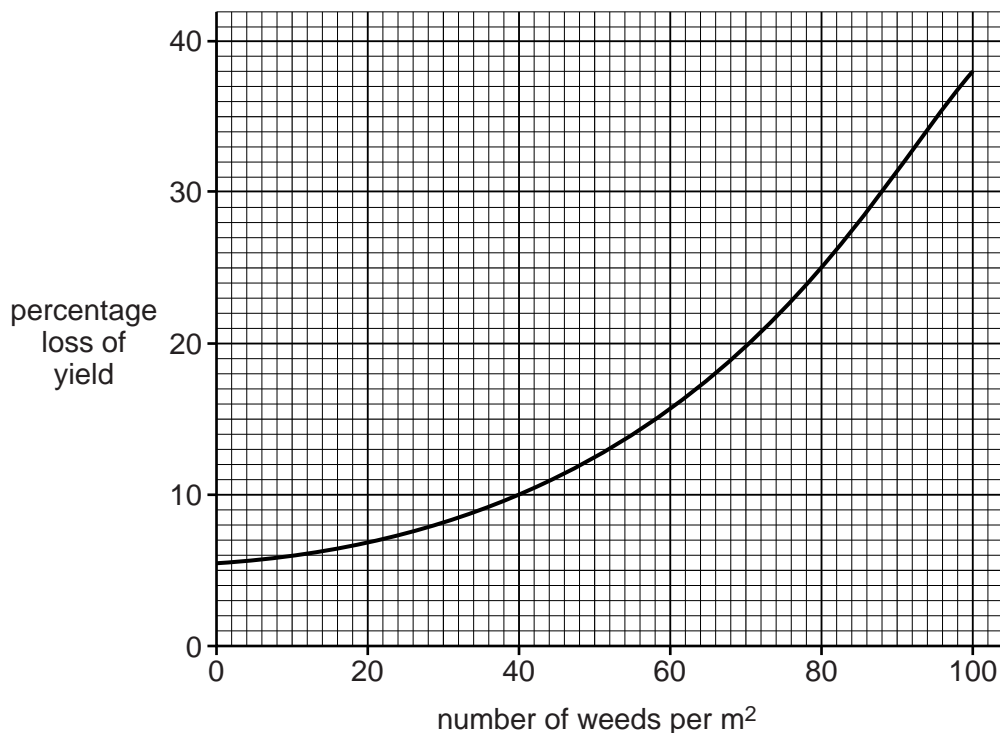


Fig. 6.1

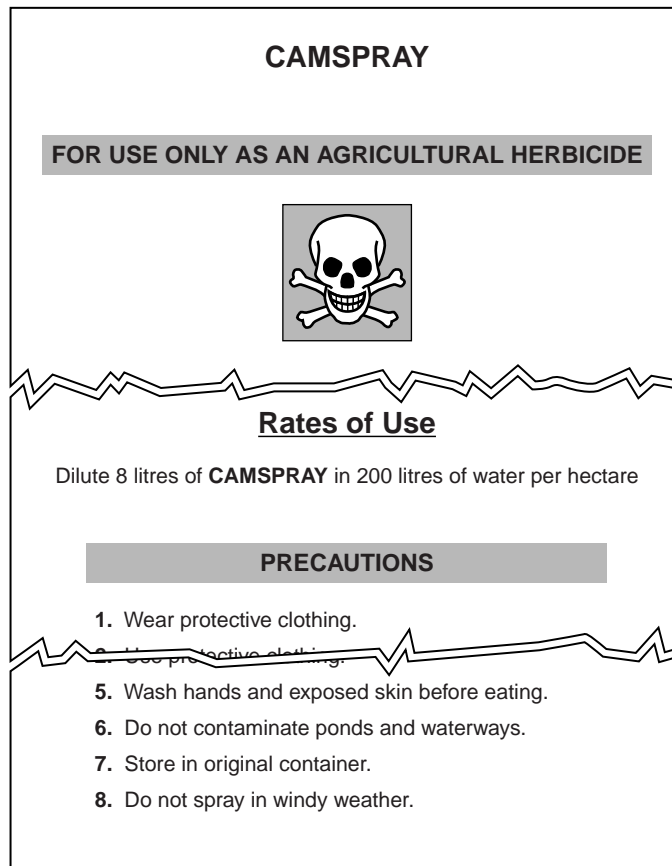
Use the graph to find

- (i) the percentage (%) yield lost at 40 weeds per m<sup>2</sup>,  
 .....% [1]
- (ii) the weed population causing a yield loss of 30%.  
 ..... weeds per m<sup>2</sup> [1]

- (b) (i) State two ways in which weeds compete with a crop to reduce the yield.
- 1 .....
- 2 ..... [2]
- (ii) State **one** way, **other than competition**, in which weeds can reduce the yield of a crop.
- .....
- ..... [1]

(c) Fig. 6.2 shows part of a label from a bottle of herbicide.

For  
Examiner's  
Use



**Fig. 6.2**

(i) What is the correct amount of herbicide that should be mixed with 10 litres of water?

- A 0.2 litres
- B 0.4 litres
- C 2.0 litres
- D 4.0 litres

Answer **A, B, C** or **D** ..... [1]

(ii) Explain the reasons for the following precautions, listed on the label.

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7. Store in original container.

.....  
.....  
.....  
..... [2]

8. Do not spray in windy weather.

.....  
.....  
.....  
..... [2]

**[Total: 10]**

7 (a) Fig. 7.1 shows an experiment to investigate the conditions needed for the germination of seeds. The seeds were placed on cotton wool in glass tubes.

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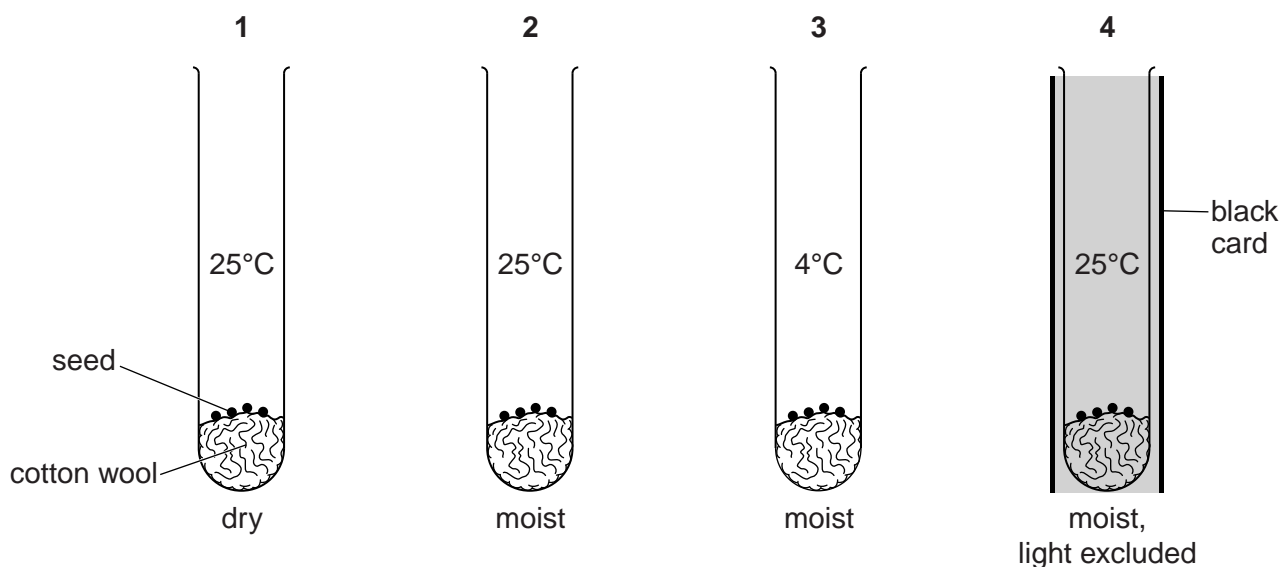


Fig. 7.1

The results are shown in Table 7.1.

Table 7.1

tube 1	tube 2	tube 3	tube 4
seeds did not germinate	seeds germinated, grew normally, leaves were green	seeds did not germinate	seeds germinated, plants became long and thin, leaves yellow

(i) From this experiment, which conditions are essential for germination of the seeds?

	light	warmth	water
<b>E</b>	✓	✓	✓
<b>F</b>		✓	✓
<b>G</b>		✓	
<b>H</b>	✓		✓

Answer **E, F, G** or **H** ..... [1]

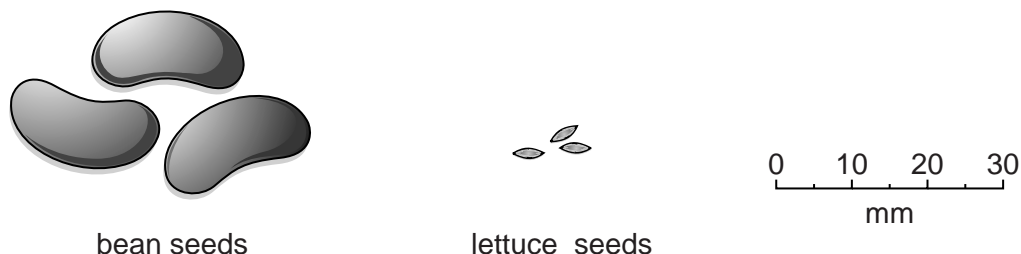
(ii) State **one other** requirement for germination, **not** shown in this experiment.

..... [1]

(b) Students sowed beans and lettuce in their school garden.

They sowed both types of seed at a depth of 4 cm.

Fig. 7.2 shows bean seeds and lettuce seeds.



**Fig. 7.2**

Many bean seedlings emerged but few lettuce seedlings emerged.

Using information from Fig. 7.2, suggest an explanation for this.

.....

.....

.....

..... [2]

(c) (i) When seeds are sown, the bed is watered and then covered with dry grass. This helps to prevent soil capping.

State what is meant by *soil capping*.

.....

..... [1]

(ii) Suggest **one other** reason for covering the seed-bed.

.....

..... [1]

**[Total: 6]**

8 (a) What is the name given to the growing of crops using a soilless medium and a nutrient solution?

- J aquaculture
- K hydroponics
- L irrigation
- M organic

Answer J, K, L or M ..... [1]

(b) (i) Fig. 8.1 shows four sacks of inorganic fertiliser.

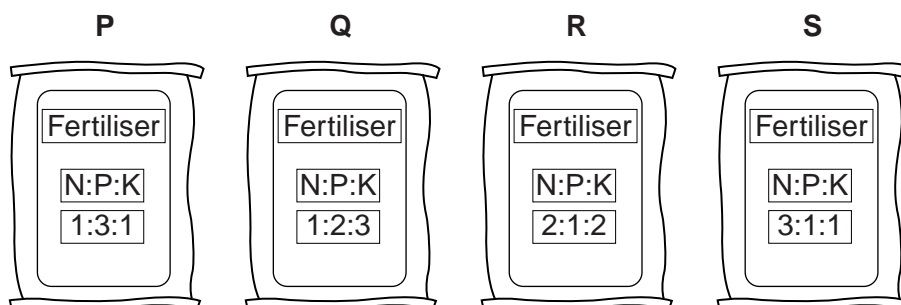


Fig. 8.1

Which sack contains the highest proportion of potassium?

Answer P, Q, R or S ..... [1]

(ii) A farmer may use an organic fertiliser such as animal (kraal) manure.

State **one** advantage and **one** disadvantage of using this type of organic fertiliser.

advantage .....

.....

disadvantage .....

..... [2]



(c) A farmer constructs a pond. He stocks it with fish which are then caught and sold as food. The fish eat algae (microscopic green plants) in the water.

For  
Examiner's  
Use

(i) The farmer adds a small quantity of animal manure to the pond.

Suggest a reason for this.

.....  
.....  
.....  
..... [2]

(ii) If too much manure is added to the pond, the fish die.

Explain why this happens.

.....  
.....  
.....  
..... [2]

**[Total: 8]**

**QUESTION 9 STARTS ON PAGE 19**

9 A farmer has a piece of land that he wants to use to grow a cereal crop.

- (a) He takes a single sample of soil from the middle of the field and carries out a test to find the pH of this soil.

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Fig. 9.1 shows the result of the test.

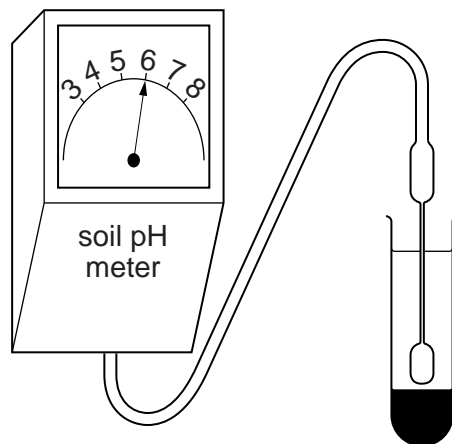


Fig. 9.1

- (i) Does the result of this test indicate that the soil is acid, alkaline or neutral?

Draw a circle round the correct answer in the list below.

**acid**

**alkaline**

**neutral**

[1]

- (ii) Explain why the farmer should test more than one soil sample from the field.

.....

.....

.....

..... [2]

- (iii) The farmer wants to increase the pH of the soil in the field before planting his crop. Suggest **one** way in which this could be done.

..... [1]

(b) The crop that the farmer wants to grow is a cereal called sorghum.

Fig. 9.2 shows the temperatures and average rainfall, throughout the year, in the farmer's local area.

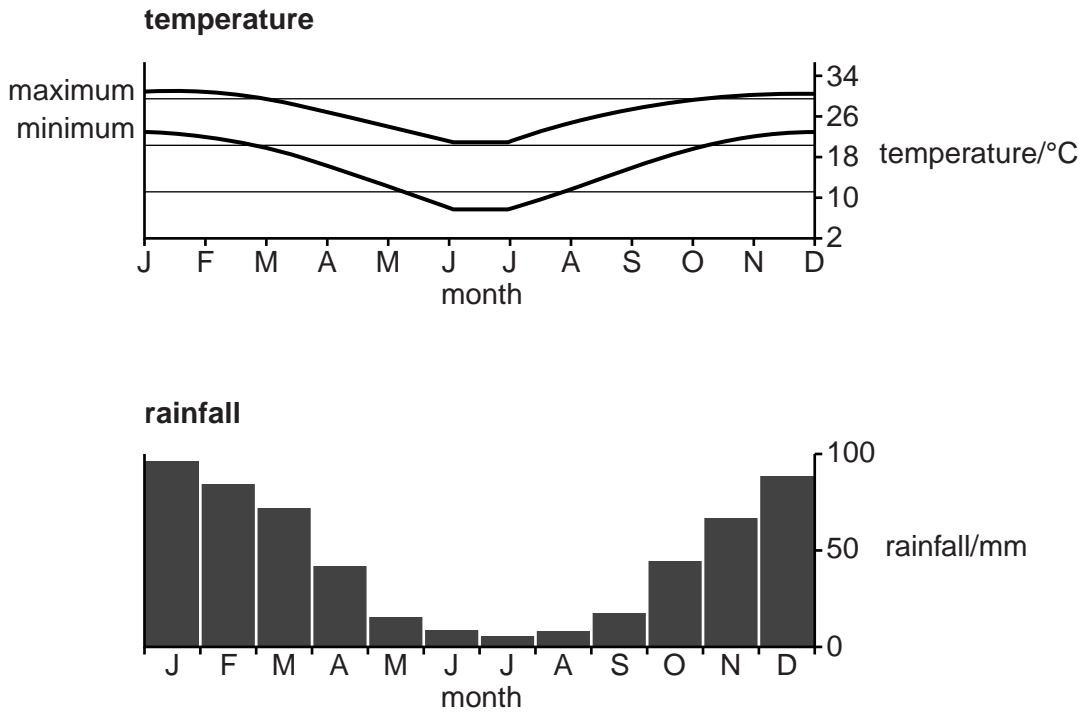


Fig. 9.2

Sorghum needs

- hot temperatures when the grains are developing and it may be damaged by temperatures close to 0°C,
- 300–400 mm of rainfall **during the growing period.**

The variety of sorghum that the farmer grows takes about four months from sowing to maturity.

Using the information in Fig. 9.2

(i) state why these climatic conditions would be suitable for growing sorghum,

.....

.....

..... [2]

(ii) suggest a month in which the sorghum should be planted and give reasons for your answer.

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month .....

reasons .....

.....

.....

..... [2]

**[Total: 8]**

**Section B**

Answer **two** questions.

Write your answers on the separate paper provided.

- 10 (a)** For a named crop, describe the land preparation needed for sowing or planting. [4]
- (b)** For the crop that you have named in **(a)**
- (i)** state the name of a disease that affects this crop, [1]
  - (ii)** describe the signs of this disease, [3]
  - (iii)** state and explain the methods that can be used for prevention and control of this disease. [7]
- 11 (a)** For a named crop-growing enterprise, outline the records that should be kept. [7]
- (b)** Describe and explain the factors that a farmer should consider when deciding which crops to grow. [8]
- 12 (a)** Describe and explain what is meant by *the water cycle*. [8]
- You may use a diagram to explain your answer.
- (b) (i)** State what is meant by the term *irrigation*. [1]
- (ii)** Describe **one** method of irrigating a field crop. [3]
- (iii)** Outline the advantages and disadvantages of this method of irrigation. [3]
- 13 (a)** Describe and explain what is meant by *photosynthesis*. [6]
- (b) (i)** State how the products of photosynthesis are moved around the plant. [3]
- (ii)** Explain, using named examples, how and why parts of a plant are modified for food storage. [6]
- 14 (a)** Describe the ways in which mineral particles in soil are formed by the weathering of rocks. [8]
- (b)** Soil also contains decaying organic matter and living organisms.
- Describe and explain the importance of each of these two components in supporting the growth of plants. [7]



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*Copyright Acknowledgements:*

Question 9b Figure 2.2 © [www.southtravels.com/Africa/Botswana/weather.html](http://www.southtravels.com/Africa/Botswana/weather.html); 9 August 2011.

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