



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
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**AGRICULTURE**

**0600/03**

Paper 3

**October/November 2011**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**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, graphs or rough working.

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

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

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>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	
<b>9</b>	
<b>Total</b>	

This document consists of **18** printed pages and **2** blank pages.



1 Table 1.1 shows part of a crop rotation.

**Table 1.1**

	<b>year 1</b>	<b>year 2</b>
<b>field A</b>		cereal crop
<b>field B</b>	cereal crop	root crop
<b>field C</b>	root crop	

(a) (i) Complete Table 1.1 to show a three field rotation using **one** of the crops below.

**inter-crop      legume crop      mono-crop      organic crop**

[1]

(ii) Explain how crop rotation benefits

the farmer, .....

.....

the soil. ....

..... [2]

(iii) Crop rotation can be considered to be important when developing a sustainable system of farming.

Suggest what is meant by the term **sustainable farming**.

.....

.....

..... [2]

(b) Fig. 1.1 shows the roots of a plant which is often used in a crop rotation.

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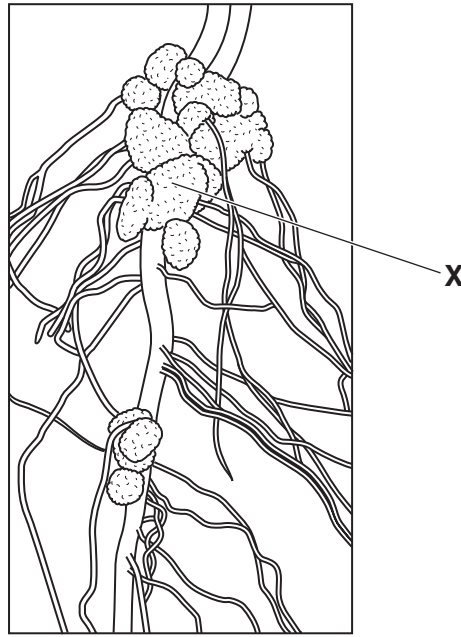


Fig. 1.1

(i) Name the part of the plant labelled **X** in Fig. 1.1.

..... [1]

(ii) Explain how the plant in Fig. 1.1 can be **used** to increase soil fertility and improve soil structure.

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

[Total: 9]

2 (a) Fig. 2.1 shows an area where weathering is taking place.

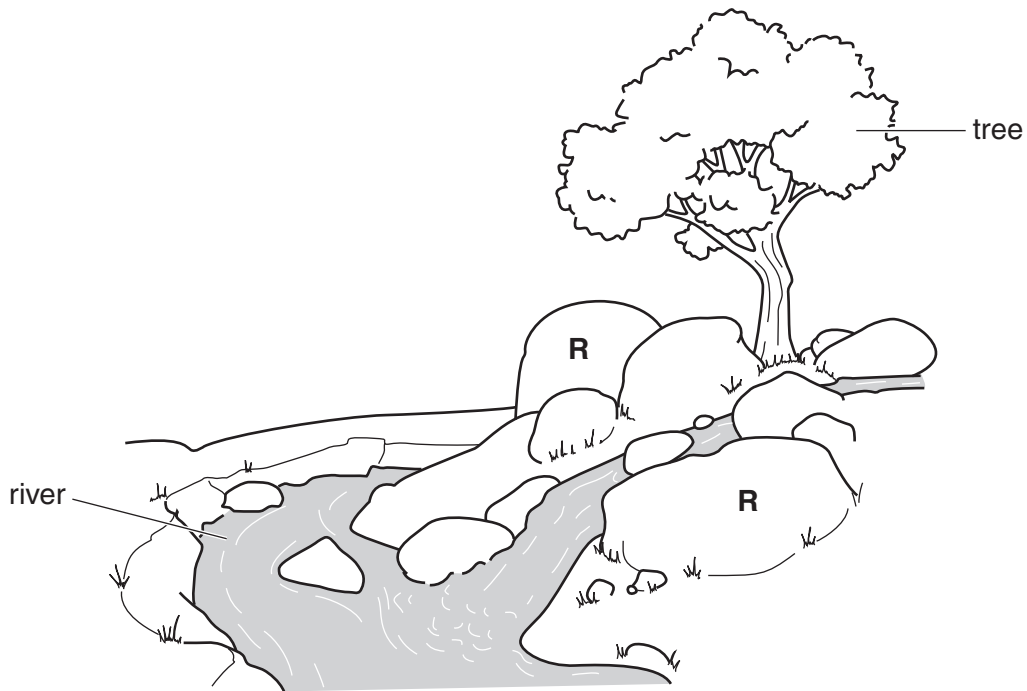


Fig. 2.1

Rocks are weathered by biological, chemical and physical agents.

(i) Place **P** on Fig. 2.1 to show a place where physical breakdown is happening. [1]

(ii) Explain how the rocks labelled **R** might be further broken down.

.....

.....

..... [2]

(b) Fig. 2.2 shows a field with terraces used for crop cultivation on steep land.

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**Fig. 2.2**

(i) Suggest how the use of terraces can improve the productivity of the land.

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

(ii) A good water supply is essential for crop production.

Describe an irrigation system and outline the advantages and disadvantages of this system.

.....  
.....  
.....  
.....  
..... [4]

[Total: 9]

- 3 Table 3.1 compares a clay soil with a sandy soil.

**Table 3.1**

	<b>clay soil</b>	<b>sandy soil</b>
<b>cultivation</b>	difficult	easy
<b>drainage</b>		
<b>temperature</b>	warms and cools slowly	warms and cools quickly
<b>water holding</b>		

- (a) (i) Complete the table using the words **good** or **poor**. [2]

- (ii) Explain why a sandy soil warms and cools quickly.

.....

.....

..... [2]

(b) Fig. 3.1 shows the availability of soil nutrients at different pH values.

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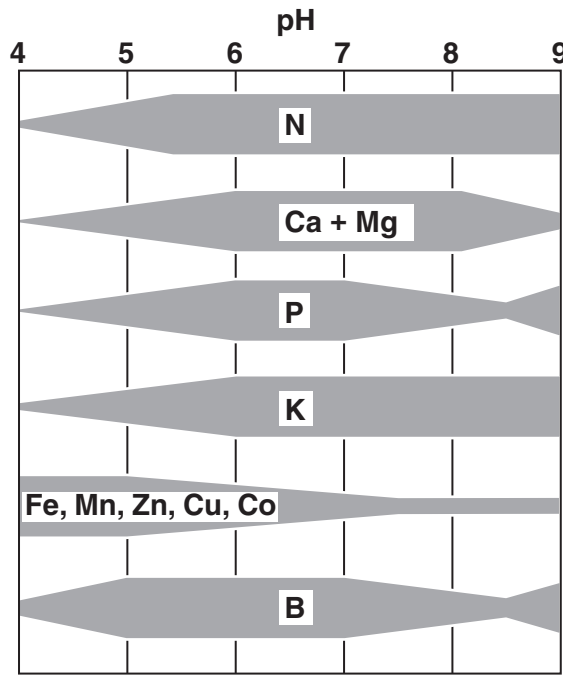


Fig. 3.1

(i) At what pH range is phosphate most readily available for crops?

..... [1]

(ii) Name a substance that could be used to raise the pH of an acid soil.

..... [1]

(iii) Farmers call a pH of 6.5 'field neutral'.  
Explain why most farmers consider a field with a pH of 6.5 to be ideal for growing most crops.  
Use information from Fig. 3.1.

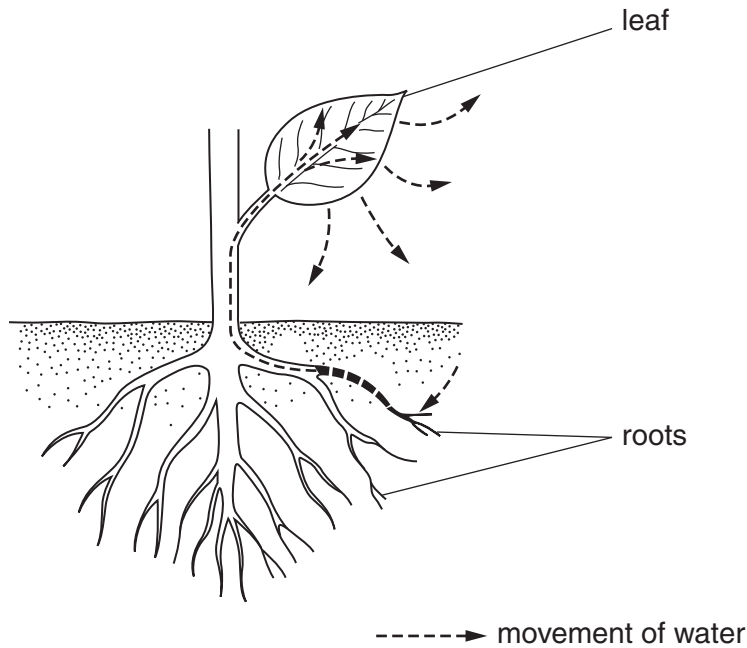
.....  
.....  
..... [2]

(iv) Suggest why livestock kept on soils with a high pH are prone to deficiency diseases.

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

[Total: 10]

4 (a) Fig. 4.1 shows parts of a plant and the way in which water moves through the plant.



**Fig. 4.1**

Water is essential for growing plants.

(i) Name the process by which water enters the roots.

..... [1]

(ii) Name the process by which water leaves the plant.

..... [1]

(b) Describe how a plant controls the amount of water it loses from its leaves.

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

(c) *Kill Fast*, is a **systemic** herbicide used to kill all weeds but not affect the soil. It is applied by spraying the leaf surfaces of weeds. Explain how the herbicide reaches the roots of perennial weeds.

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

[Total: 7]



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**Question 5 starts on page 10.**

- 5 (a) You are asked to grow a root crop in a garden plot. The garden plot was last cultivated two years ago. Describe how you would produce a seed bed for a named root crop in this plot.

.....

.....

.....

..... [3]

- (b) Fig. 5.1 shows a building for storing crops after harvest.



Fig. 5.1

- (i) Explain how you would recognise that a root crop is ready to be harvested and ready for storage.

.....

.....

..... [2]

- (ii) Give **two** environmental conditions needed for the successful storage of root crops like potatoes or yams.

.....

..... [1]

(iii) The farmer needs to build a new crop store using different materials.

Suggest **one** material the farmer could use.

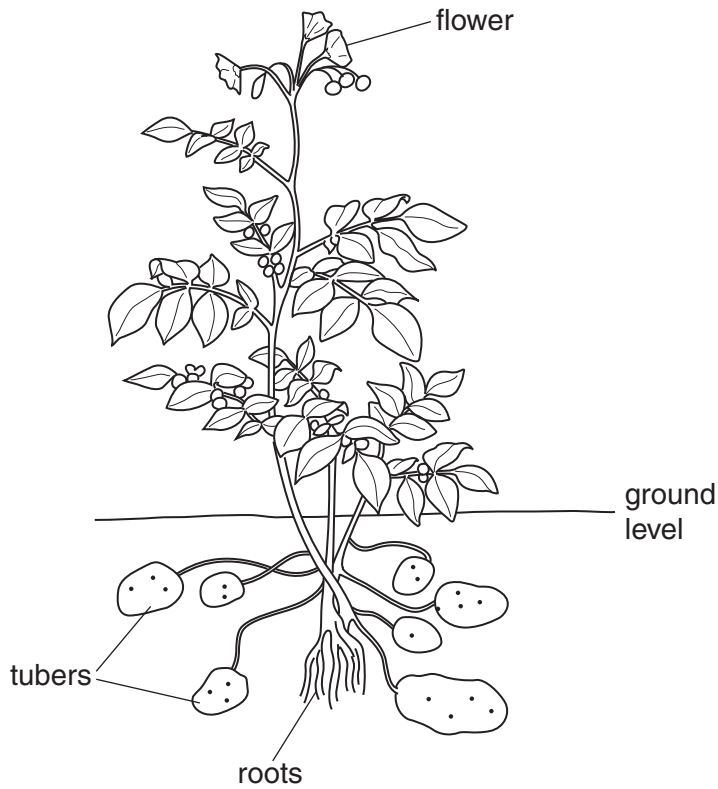
Explain the advantages of using this material to build the store.

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

[Total: 9]

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6 (a) Fig. 6.1 shows an Irish potato plant.



**Fig. 6.1**

Irish potatoes can suffer from blight.

(i) What type of organism causes blight? ..... [1]

(ii) Give the environmental conditions which favour the spread of blight.

..... [1]


- (b) The Irish potato in Fig. 6.1 is resistant to blight.  
Resistance is genetically determined by the dominant allele R.

The blight resistant plant in Fig. 6.1 has the alleles R and r.  
It is crossed with one that is non resistant.

- (i) Complete the genetic diagram for this cross.

resistant plant            x            non resistant plant

[4]

- (ii) Put a circle  around a homozygous recessive offspring.

[1]

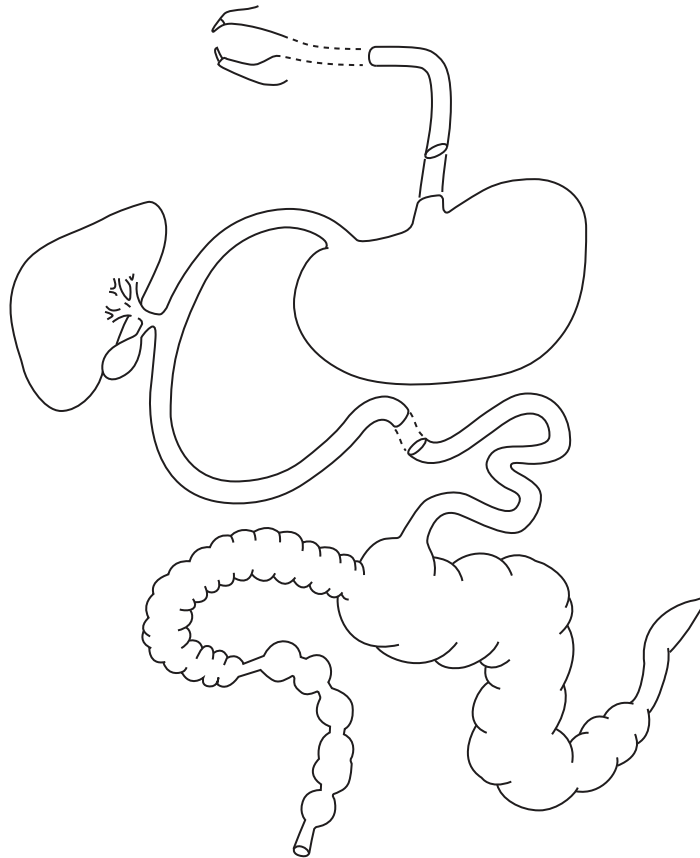
- (c) Potatoes and yams are cultivated asexually.  
Explain an advantage and a disadvantage of growing crops asexually.

.....  
.....  
.....  
.....

[3]

[Total: 10]

7 Fig. 7.1 is a diagram of the digestive system of a rabbit.



**Fig. 7.1**

**(a) (i)** Label the duodenum and the rectum on the diagram. [2]

**(ii)** The pancreas is missing from the diagram.

Draw an X on the diagram to show the position of the pancreas. [1]

**(iii)** The pancreas produces enzymes that aid digestion.

Explain the role of enzymes in digestion of food.

.....

.....

..... [2]

(b) Both rabbits and sheep eat grass.  
Rabbits are classed as non-ruminants, sheep are classed as ruminants.  
Explain why.

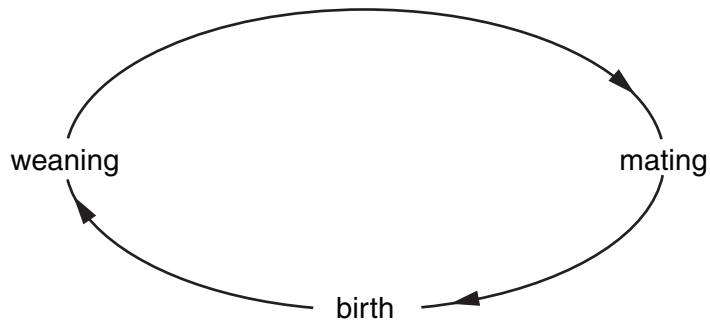
.....  
.....  
..... [2]

(c) Explain how ruminants digest cellulose in plant cell walls.

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

[Total: 10]

8 Fig. 8.1 shows the life cycle of a farm animal.



**Fig. 8.1**

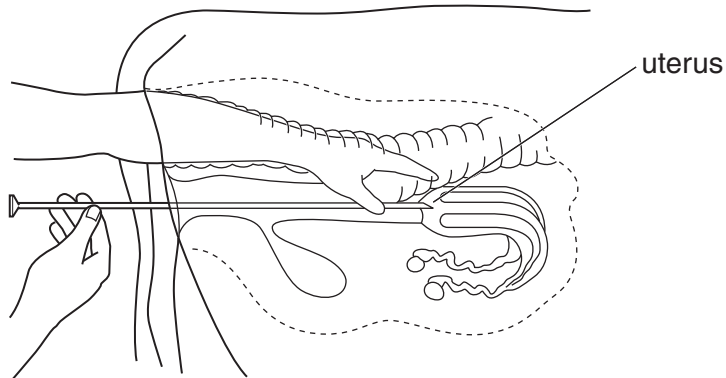
(a) (i) Label on Fig. 8.1 where lactation starts. [1]

(ii) Explain the importance of colostrum to young animals.

.....

..... [2]

(b) Fig. 8.2 shows a vet inseminating a cow by artificial insemination (AI).



**Fig. 8.2**



- (i) The vet's hand, which is inside the rectum, is manipulating the inseminator into the uterus of the cow.

What is the name of the opening to the uterus?

..... [1]

- (ii) Give **two** reasons why a farmer with a small herd of cattle might choose artificial insemination.

.....  
..... [1]

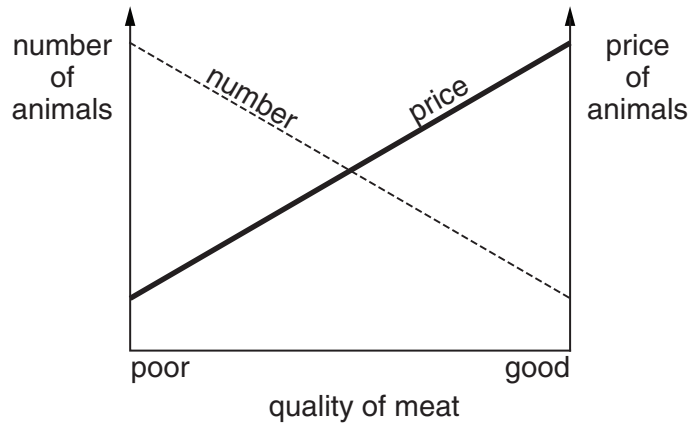
- (iii) Explain how artificial insemination could be used as part of a breeding programme to improve the cattle.

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

[Total: 8]

9 (a) Most farm animals are kept for meat.

Fig. 9.1 shows the relationship between the quality of meat and the number and price of animals.



**Fig. 9.1**

What does the graph in Fig. 9.1 show?

..... [1]

(b) Fig. 9.2 shows water buffalo being housed indoors. Some farmers keep animals for part of their lives in livestock houses. This is a semi-intensive system.



**Fig. 9.2**

Why do animals reared using semi-intensive systems tend to be more productive than those reared using free range systems?

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

(c) A farmer wishes to develop a semi-intensive system for rearing cattle.  
The farmer wants to borrow money from a bank to do this.  
What information would the farmer need to provide to the bank to support his plan?

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.....

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.....

.....

..... [5]

[Total: 8]

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