UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

9612789979

AGRICULTURE **5038/01**

Paper 1 **October/November 2007**

2 hours

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.

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 **three** questions.
Write your answers on the separate 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	
Section A	
Section B	
Total	

This document consists of **13** printed pages and **3** blank pages.

UNIVERSITY of CAMBRIDGE International Examinations

Section A

Answer **all** the questions.

1 Fig. 1.1 shows a soil profile.

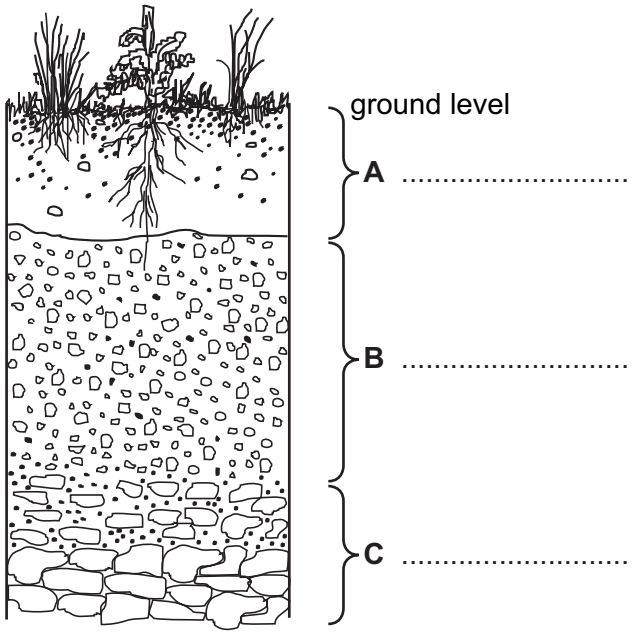

Fig. 1.1

(a) (i) Complete the labels **on the diagram**, to give the names of the layers **A**, **B** and **C**. [3]

(ii) Which layer contains the highest proportion of humus?

..... [1]

(iii) Most plant roots are found in layer **A**.

Explain why most plant roots are found in this layer.

.....

..... [1]

(b) Fig. 1.2 shows the amounts of different particles in three soil samples, **X**, **Y** and **Z**.

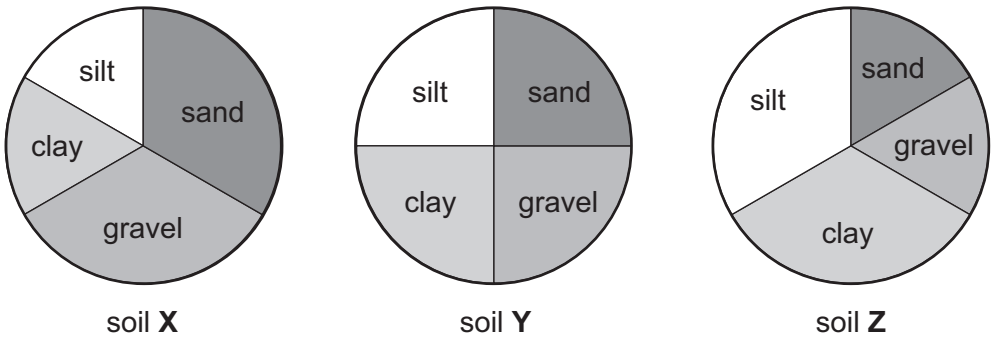

Fig. 1.2

(i) Which soil sample would drain fastest?

..... [1]

(ii) Explain the reason for this.

.....

.....

..... [2]

[Total: 8]

2 **(a)** Table 2.1 shows sets of conditions to which trays of seeds were exposed.

Table 2.1

tray	water	light all around	light from one direction
A	✓		
B	✓	✓	
C	✓		✓
D		✓	

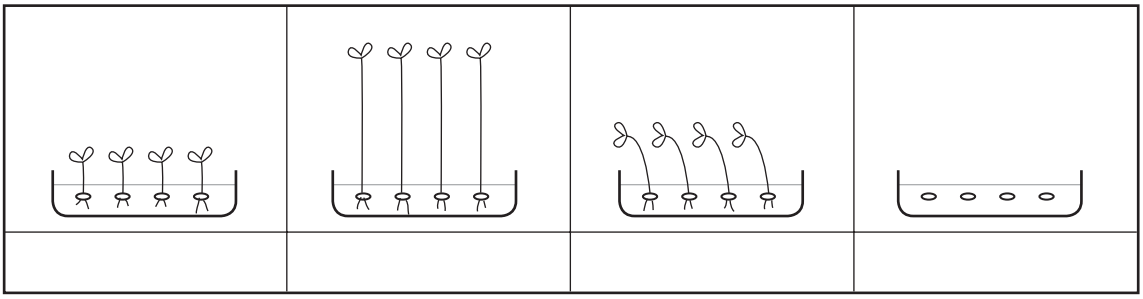

Fig. 2.1

Fig. 2.1 shows the four trays after one week kept at 25°C.
Write the correct letter underneath each tray in Fig. 2.1. [2]

(b) **(i)** What is the name of the plant process for which light is essential?

..... [1]

(ii) Complete the word equation for this process.

..... + ... $\xrightarrow[\text{chlorophyll}]{\text{light}}$ ..... + ...

[2]

(c) When seeds germinate under the ground, they cannot carry out the process in **(b)**.

Explain why they do not need to carry out this process in order to germinate.

.....

.....

.....

..... [3]

[Total: 8]

3 **(a)** Table 3.1 shows the content of three types of cattle fodder.

Table 3.1

fodder type	% crude protein	% calcium
fodder **A**	18.3	2.01
fodder **B**	8.1	0.23
fodder **C**	6.4	0.00

(i) Which type of fodder, **A**, **B** or **C**, is likely to have been made mainly from a leguminous plant?

..... [1]

(ii) Explain the reason for your choice.

.....

..... [1]

(b) A ruminant animal has a body weight of 450kg. The amount of forage needed by the animal, per day, is 2% of its body weight.

(i) Calculate the amount of forage needed per day by this animal. (*Show your working*.)

..... kg [2]

(ii) The ration needed for this ruminant when lactating is 2.5% of its body weight per day.

Calculate the additional forage ration, needed by the lactating ruminant.

..... kg [2]

(iii) What is meant by *lactation*?

.....

..... [2]

(c) The ration needed to maintain the weight and health of an animal is called the *maintenance ration*. What is the additional ration needed by the lactating animal called?

..... [1]

[Total: 9]

4 A number of stem cuttings are taken from the same parent plant. The alleles for flower colour are **R** = red and **r** = white. The plants produced from the cuttings all have red flowers.

(a) Explain why the cuttings all have flowers that are the same colour.

.....

.....

..... [2]

(b) The plants raised from cuttings are used to produce seed. When this seed is sown, some of the plants produced have white flowers and some have red flowers.

Explain why plants raised from seed from these cuttings may have red or white flowers. You may use a diagram to illustrate your answer.

.....

.....

..... [4]

(c) What proportion of the plants raised from these seeds would be expected to have white flowers? (*Show your working.*)

..... [1]

[Total: 7]

5 **(a)** The graph in Fig. 5.1 shows the effect of the number of weeds in a crop on the percentage (%) crop yield that is lost.

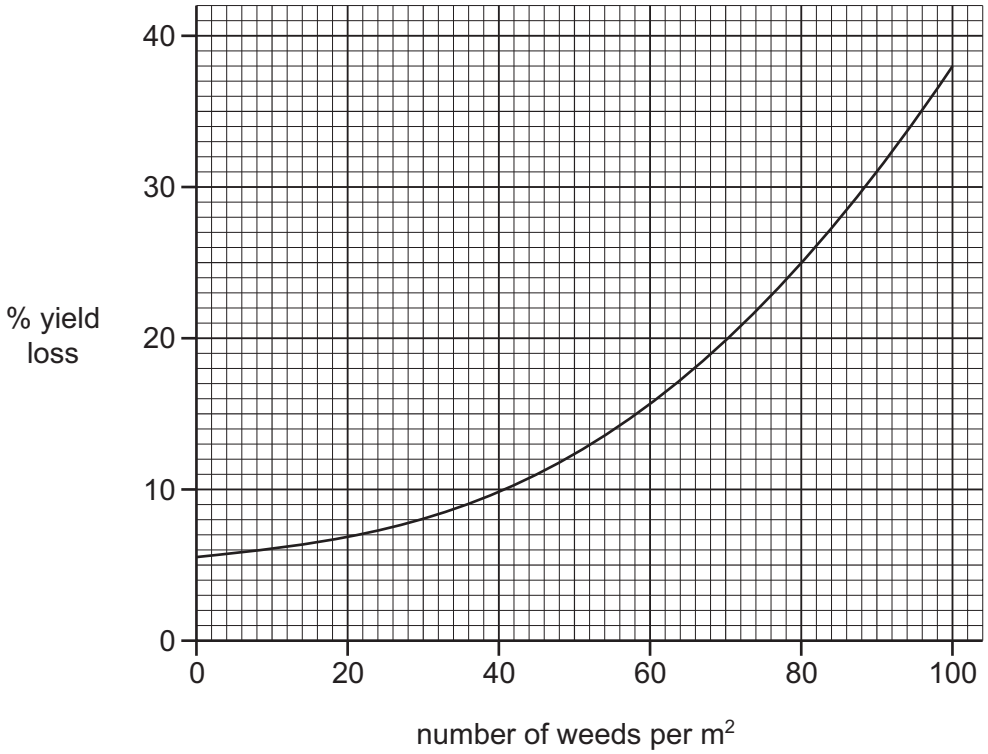

Fig. 5.1

(i) What is the effect of an increase in the number of weeds per m^2 on crop yield?

..... [1]

(ii) Use the graph to find:

% yield lost when there are 30 weeds per m^2;

.....%

the weed population that would cause a 25% loss in yield.

.....weeds per m^2 [2]

(b) Explain how weeds can reduce the yield of a crop.

.....

.....

.....

..... [3]

[Turn over

(c) Weeds are often controlled by spraying with herbicides. State **two other** methods of weed control.

1 .....

2 ..... [2]

[Total: 8]

6 **(a)** Fig. 6.1 shows the reproductive system of a female mammal.

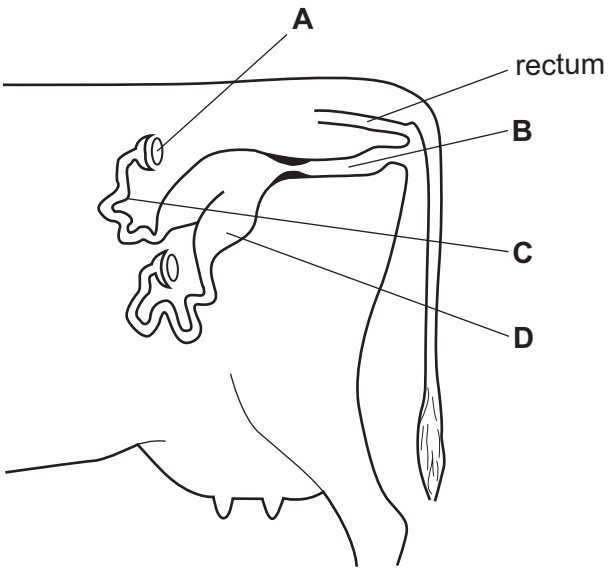

Fig. 6.1

(i) Give the name of structure **C**.

..... [1]

(ii) Give the letter of the structure in which fertilisation occurs.

..... [1]

(iii) Give **one** function of structure **A**.

..... [1]

(iv) Give the letter of the structure in which the fetus develops.

..... [1]

(b) A house for small livestock, such as goats or calves, is to be built. Using the list below, complete the table with materials for the roof, walls and floor. Give a **different** reason for the choice of each material.

thatch **corrugated iron** **brick** **wood** **concrete** **earth**

part of building	material	reason
roof		
walls		
floor		

[3]

[Total: 7]

7 In some countries at least 70% of the population lives in cities. Some people have to spend up to 80% of their income to buy food. The photograph in Fig. 7.1 shows an experimental project to enable people in cities to grow vegetables on flat roofs and balconies.

Fig. 7.1

- Shallow $1m^2$ trays are filled with gravel and groundnut shells and water.
- Fertiliser solution is added every day.
- The trays are cheap to build.
- One tray can produce up to 50kg of tomatoes per year.

(a) Suggest **two** advantages that this project could have for a country.

1 .....

.....

2 .....

..... [2]

(b) Suggest **one** advantage of mixing groundnut shells with gravel in the trays.

.....

..... [1]

(c) Name **one** substance that the fertiliser solution would need to contain in order to grow healthy crops.

..... [1]

(d) Suggest and explain **one** difference between a fertiliser solution used for leafy crops, such as lettuce and a fertiliser solution used for fruiting crops such as tomatoes.

.....

.....

..... [3]

(e) Suggest **one** reason why it would be easier to grow short crops, such as lettuce, rather than tall crops, such as maize, using this system.

.....

..... [1]

[Total: 8]

[Turn over

Section B

Answer any **three** questions. Write your answers on the separate Answer Paper provided.

8 **(a)** Describe the processes in the digestion of food in the four chambers of a ruminant's stomach. [7]

(b) **(i)** Describe a system of rotational grazing.

(ii) Explain the advantages of rotational grazing over an extensive grazing system. [8]

[Total: 15]

9 **(a)** Give **one** example of each of the following types of crop pest:

(i) biting and chewing;

(ii) piercing and sucking;

(iii) boring. [3]

(b) **(i)** For **one** of the pests that you have named in **(a)**, describe its life cycle. [5]

(ii) Describe the damage that this pest causes to crops. [3]

(iii) Outline ways in which the pest can be controlled. [4]

[Total: 15]

10 **(a)** For a green plant, describe the way in which water is:

(i) absorbed by the roots;

(ii) carried through the plant;

(iii) lost from the leaves. [12]

(b) Explain the importance of the flow of water through a plant. [3]

[Total: 15]

11 Describe and explain the precautions you would take when handling and storing:

(a) farm chemicals such as insecticides and herbicides;

(b) inflammable fuels such as petrol. [15]

[Total: 15]

12 (a) A crop has been harvested from a small piece of land, leaving the crop remains on the ground. The land is to be cultivated so that another crop can be sown.

(i) List **three** hand tools that you would use to cultivate this land to produce a fine tilth. [1]

(ii) Describe the purpose of each tool that you have listed. [6]

(iii) Describe how you would care for these tools so that they remain in good condition. [5]

(b) If a large area of land is to be cultivated, large machinery, pulled by a tractor or animals may be used. For each of the hand tools that you have listed in **(a)(i)**, state the machine that would do the same cultivation job. [3]

[Total: 15]

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