Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

AGRICULTURE

0600/03

Paper 3

October/November 2006

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

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	
1	
2	
3	
4	
5	
6	
7	
8	
Total	

This document consists of **14** printed pages and **2** blank pages.

1 **(a)** Complete Table 1.1 by stating an example **and** a major use of each group of livestock kept by Man.

Table 1.1

Group	Example	Use of livestock by Man
non-ruminant		
ruminant		
fish		

[3]

(b) Fig. 1.1 shows a forecast in the change in population for each continent.

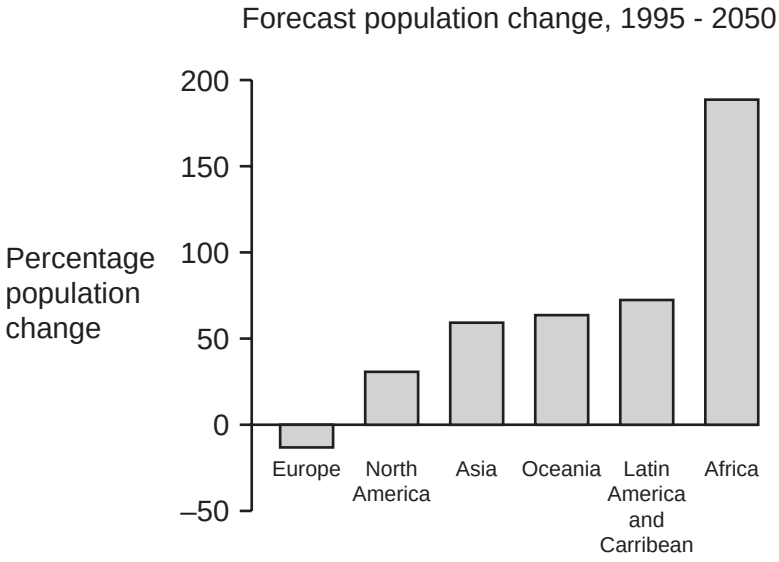

Fig. 1.1

(i) On which continent is it forecast there will be the smallest percentage increase in population?

..... [1]

(ii) Suggest, with a reason, which continent will need the greatest increase in food production between 1995 and 2050.

continent .....

reason .....

..... [2]

(c) Explain why some types of land are difficult to use for agricultural purposes.

.....

.....

.....

..... [2]

(d) Describe how the increased demand for food production might affect the environment.

.....

.....

.....

..... [2]

[Total : 10]

[Turn over

2 **(a)** Fig. 2.1 shows what happens to the water provided for irrigation in two areas used for growing a root crop.

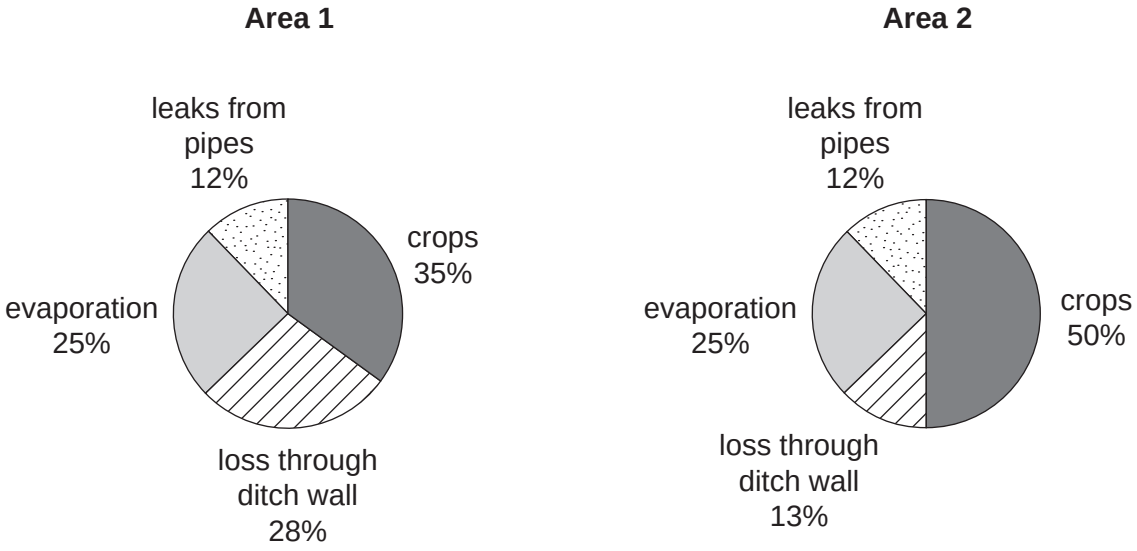

Fig. 2.1

(i) State, giving a reason, in which area would there be the greater yield.

Area .....

reason .....

..... [1]

(ii) Suggest why there is greater water loss through the ditch wall in **Area 1**.

.....

.....

..... [2]

(iii) Describe a method of reducing water loss through the ditch wall.

..... [1]

(iv) The farmer in **Area 2** decides to practice mulching to try to increase the yield of the root crop. State, giving a reason for your choice, a material that could be used for the mulch.

mulch .....

reason .....

.....

..... [2]

(v) On Fig. 2.2, complete the pie chart to suggest what happens to water after the mulch has been applied to **Area 1**.

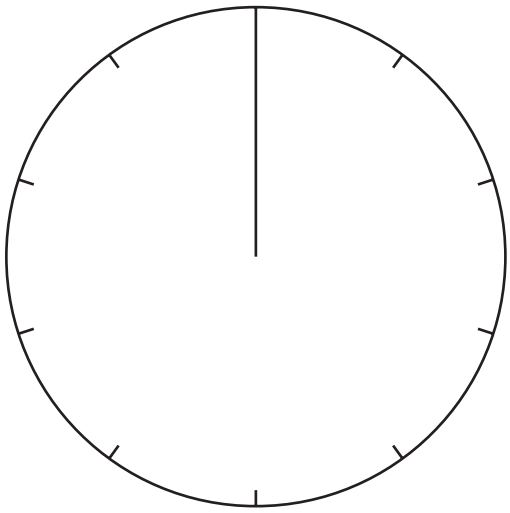

Fig. 2.2

[2]

(b) Over-watering can cause leaching. Explain how leaching may reduce the yield of the crop.

.....

.....

.....

.....

..... [4]

[Total : 12]

3 **(a)** Fig. 3.1 shows how a soil sample settles after mixing with water.

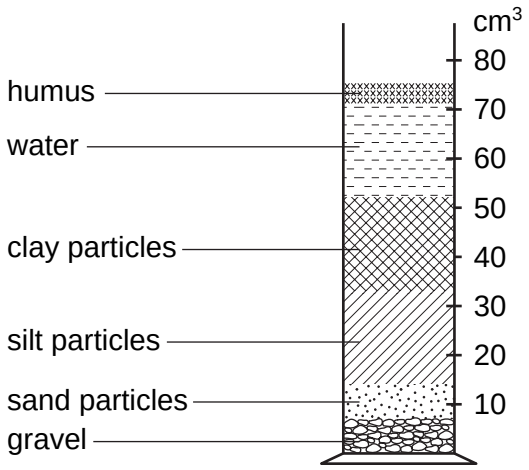

Fig. 3.1

(i) State the type of soil.

..... [1]

(ii) Suggest the properties of this soil.

.....

.....

..... [2]

(b) Describe how a farmer could determine the pH of a soil sample.

.....

.....

.....

..... [3]

(c) Fig. 3.2 shows the pH requirements of a number of crops.

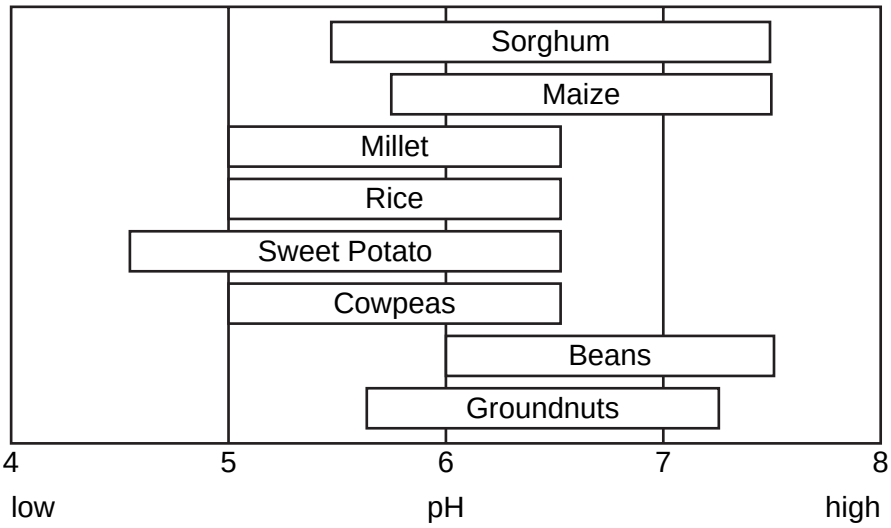

Fig. 3.2

(i) State which crop, in Fig 3.2, can grow in the most acidic soils.

..... [1]

(ii) Considering pH only, state which **two** crops in Fig 3.2 grow in the widest range of soils.

..... [1]

(iii) If the soil in a field is pH 5.5, describe what could be done to grow a good crop of beans.

.....

.....

..... [2]

[Total : 10]

4 **(a)** Maize is pollinated by wind. Fig. 4.1 shows the flower of another grass.

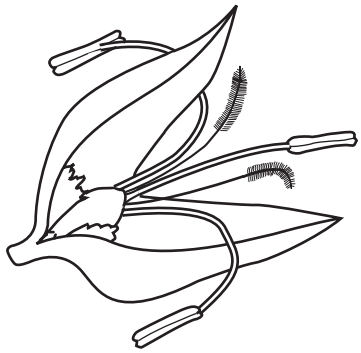

Fig. 4.1

(i) On the diagram label which structure is an anther. [1]

(ii) Describe the processes that take place after pollination, leading to fertilisation.

.....

.....

.....

.....

..... [4]

(b) Explain how artificial selection can be used to improve the yield of maize.

.....

.....

.....

.....

..... [3]

(c) The dominant allele for large grains in maize is represented by **H**, the recessive allele for small grains is represented by **h**.

(i) What is meant by the term *dominant*?

.....

.....

..... [1]

(ii) A large-grained homozygous cultivar is crossed with a homozygous small-grained cultivar. Complete Fig. 4.2 to predict the results of the cross.

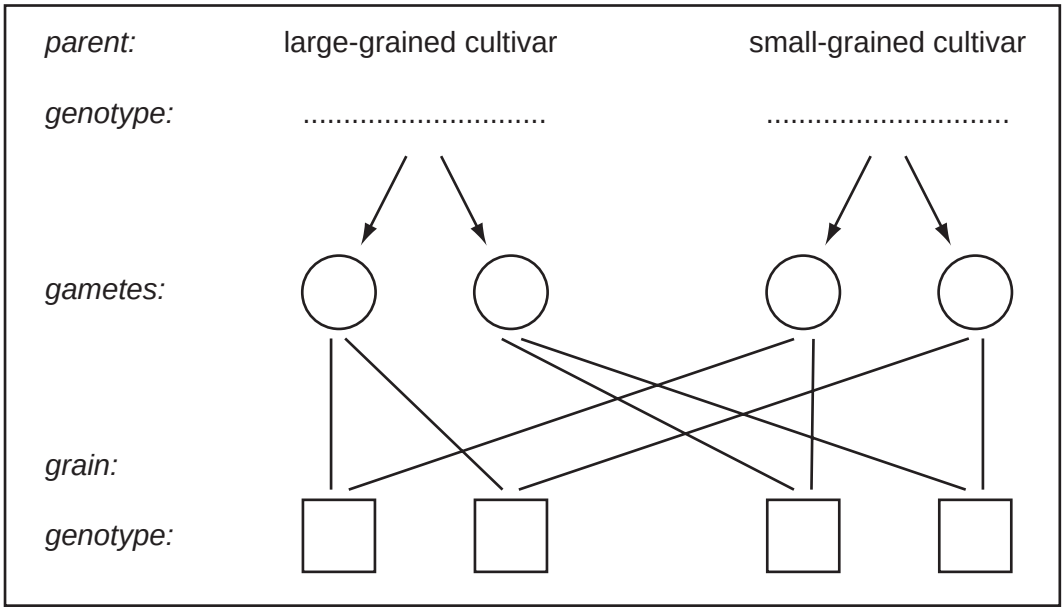

Fig. 4.2

[4]

(d) Explain how a farmer would decide which cultivar of a crop to grow.

.....

.....

.....

.....

..... [2]

[Total : 15]

5 **(a)** Five pesticides were tested to find their effectiveness at protecting a crop from five pests. The percentages of infested plants one week after treatment are shown in Table 5.1.

	% of infested plants				
treatment	flea beetle	green aphid	blue-grey aphid	moth caterpillar	butterfly caterpillar
A	35	10	15	35	35
B	25	17	20	45	40
C	25	30	25	42	36
D	30	15	22	37	31
E	14	70	80	30	20
untreated	70	68	71	55	61

Table 5.1

(i) Which pesticide was most effective at reducing infestation by moth caterpillars?

..... [1]

(ii) Which pesticide was least effective in reducing infestation by flea beetle?

..... [1]

(iii) Suggest a reason why there was greater infestation by blue-grey aphid in the crop treated by pesticide E than in the untreated crop.

.....

..... [1]

(iv) Fig. 5.1 is part of a label from a container of pesticide to be applied to the crop.

Pesticide
Rate of use

80g in 200 litres of water

Fig. 5.1

What mass of pesticide will be required to make enough solution to fill a 10 litre knapsack sprayer? Show your working.

Answer ..... [2]

(b) (i) For a named root crop grown locally, describe the method of harvesting.

Name of root crop .....

.....

.....

.....

..... [2]

(ii) State and explain **two** conditions needed to store the crop.

1. .....

.....

2. .....

..... [4]

[Total : 11]

6 **(a)** Explain how the control of grazing can improve the quality of pasture.

.....

.....

.....

.....

..... [4]

(b) Other than for the control of grazing, state two uses for fences and sketch each fence.

use 1 .....

sketch 1

use 2 .....

sketch 2

[4]

[Total : 8]

7 **(a)** Fig. 7.1 shows the digestive system of a ruminant.

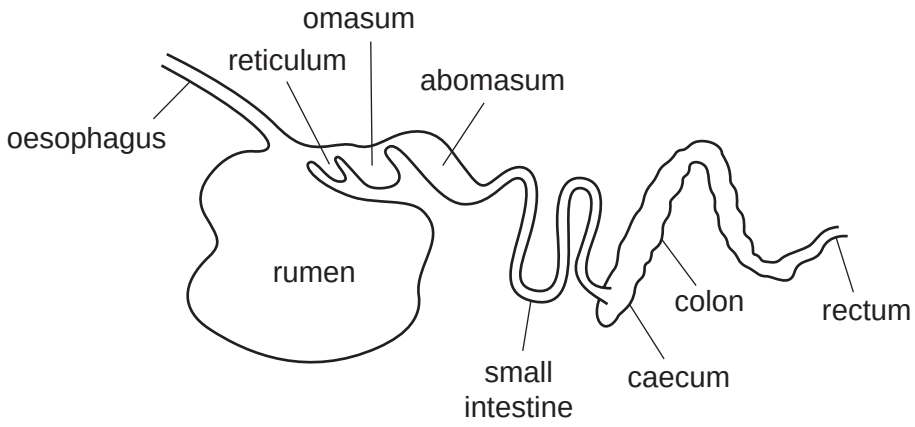

Fig. 7.1

(i) On the diagram, shade the part containing microorganisms involved in the digestion process. [1]

(ii) Describe the role of enzymes in digestion.

.....

.....

.....

.....

..... [3]

(b) Explain how livestock rations are related to the age and use of animals.

.....

.....

.....

..... [3]

[Total : 7]

8 **(a)** **(i)** Explain why the yields from livestock would be increased by controlling the timing of breeding.

.....

.....

.....

.....

..... [3]

(ii) List two records the farmer would need to keep in order to control breeding.

.....

.....

..... [2]

(b) Explain why a farmer should prepare a budget before starting a new activity.

.....

.....

..... [2]

[Total : 7]

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