UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

AGRICULTURE **0600/03**

Paper 3 **October/November 2009**

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.
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	
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

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

UNIVERSITY of CAMBRIDGE
International Examinations

[Turn over

1 (a) (i) Name **one** cereal crop used by man for food.

....

As more countries become industrialised there is more need for energy.
Coal and oil, which are used for fuel, are running out.

Crops can be grown and used for fuel rather than food.
Fig. 1.1 is a bar chart that shows the benefits of growing crops for fuel in different parts of the world.
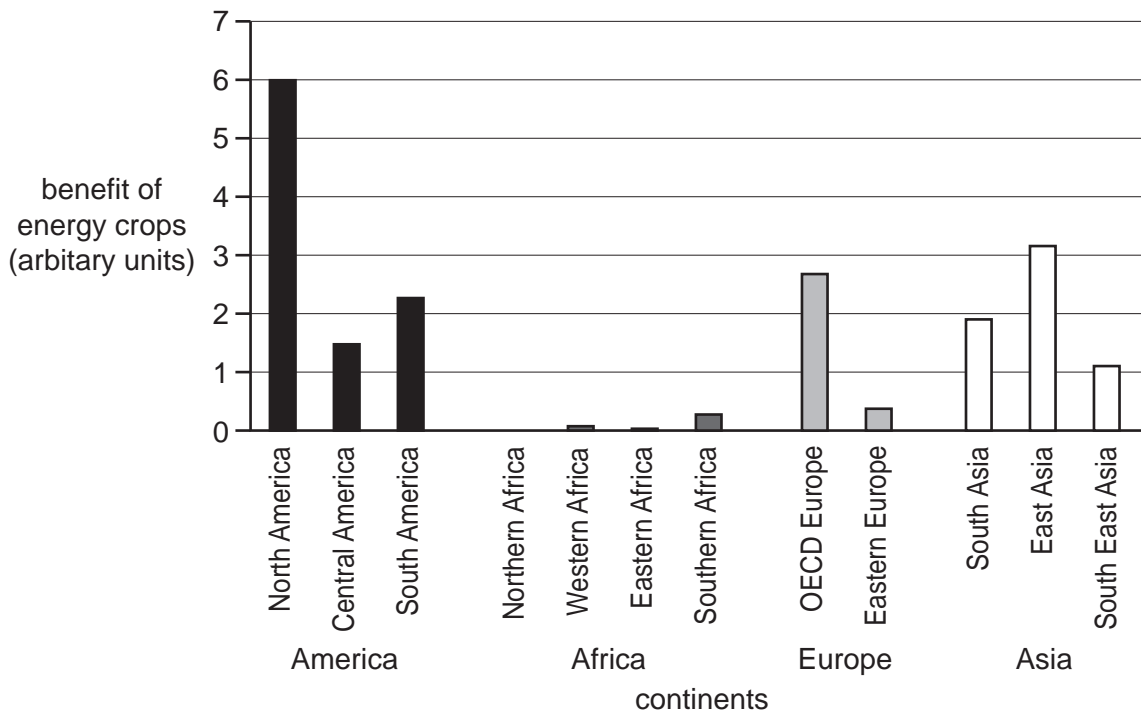
Fig. 1.1

(ii) List the continents in the order in which they benefit from growing 'fuel' crops.
Use the information in the bar chart.

most benefit ....

....

....

least benefit .... [2]

(iii) Suggest a reason to explain why so little benefit is possible in the continent you placed at the bottom of the list.

....

.... [1]

(iv) How may growing more crops for fuel affect the world price of food crops?

....

.... [1]

(b) Agriculture needs to be sustainable. Explain how the following farming practices might affect the long term productivity of farm land.

(i) Increasing the use of inorganic fertilisers.

....

.... [2]

(ii) Ploughing land that had previously been used for grazing.

....

.... [2]

[Total: 9]

2 **(a)** Fig 2.1 shows pie charts that represent the composition of four soils **A**, **B**, **C** and D.

A   B

key

■ coarse sand

☰ fine sand

∴ silt

□ clay

C   D
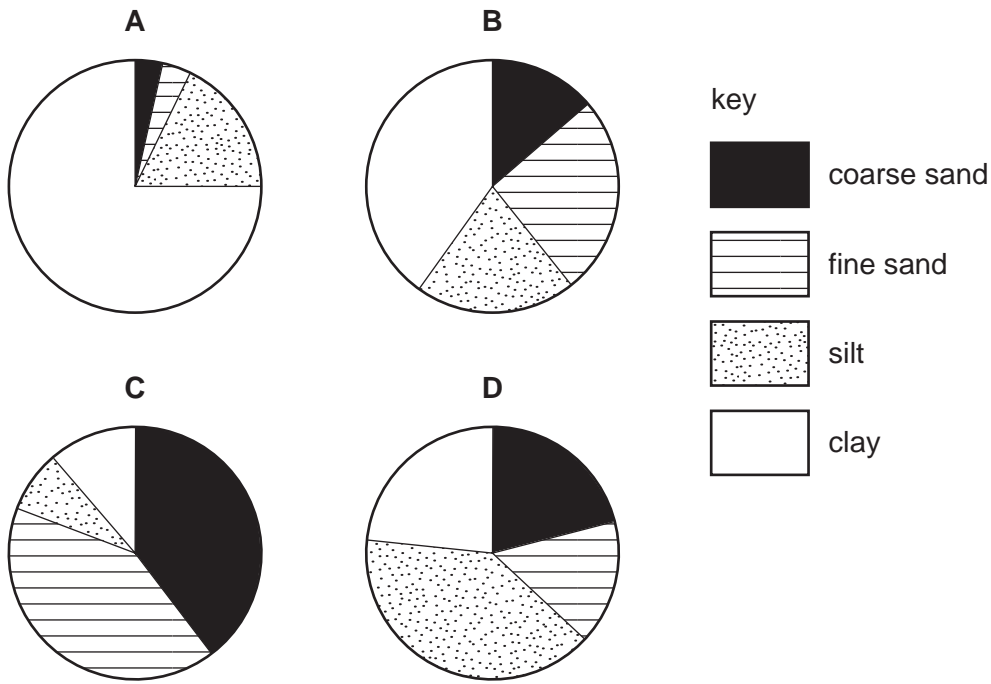
Fig. 2.1

(i) Which soil would **not** drain well?

.... [1]

(ii) Give a reason for your answer.

....

.... [1]

(iii) Describe a pipe drain.

....

....

.... [2]

(iv) Suggest why pipe drains are used rather than ditches to drain grazing land.

....

.... [1]

(b) Table 2.1 below shows the productivity of cereal crops following the application different pesticides.

Table 2.1

Treatment	Yield in Tonnes/per hectare	Cost per hectare in US dollars
No treatment	2.5	Nil
Aphid Death	3.8	10
Ridit	4.0	15
Combo Death	5.5	16
Destroyall	5.8	18
Natro-organic	3.5	2

(i) On the graph paper below draw a bar chart to show the yield per hectare of each treatment.

[4]

For
iner's
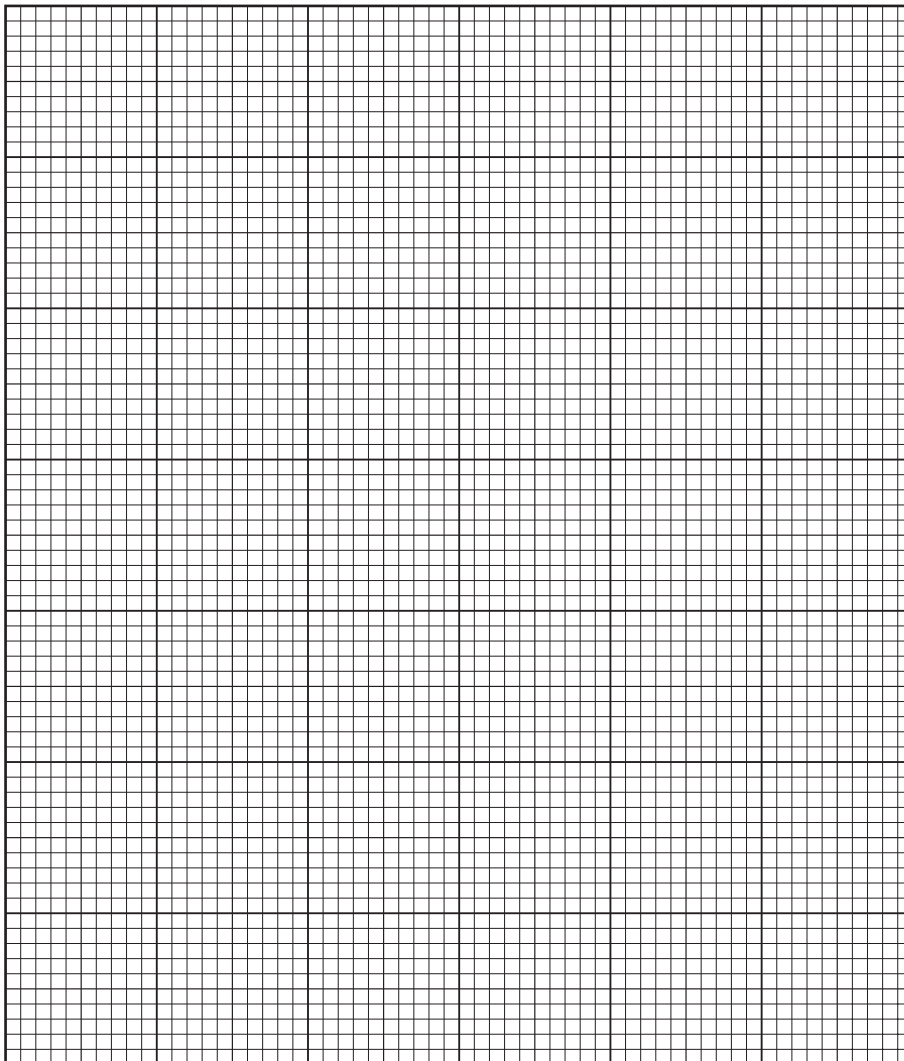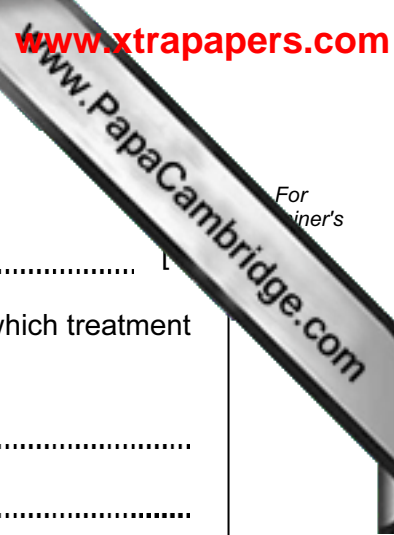
(ii) Which treatment increased the yield the most?

.... [

(iii) Name **three** other factors you would need to know before deciding which treatment to use.

1 ....

2 ....

3 .... [3]

[Total: 13]

For
...iner's

3 Fig 3.1 shows the nitrogen cycle.
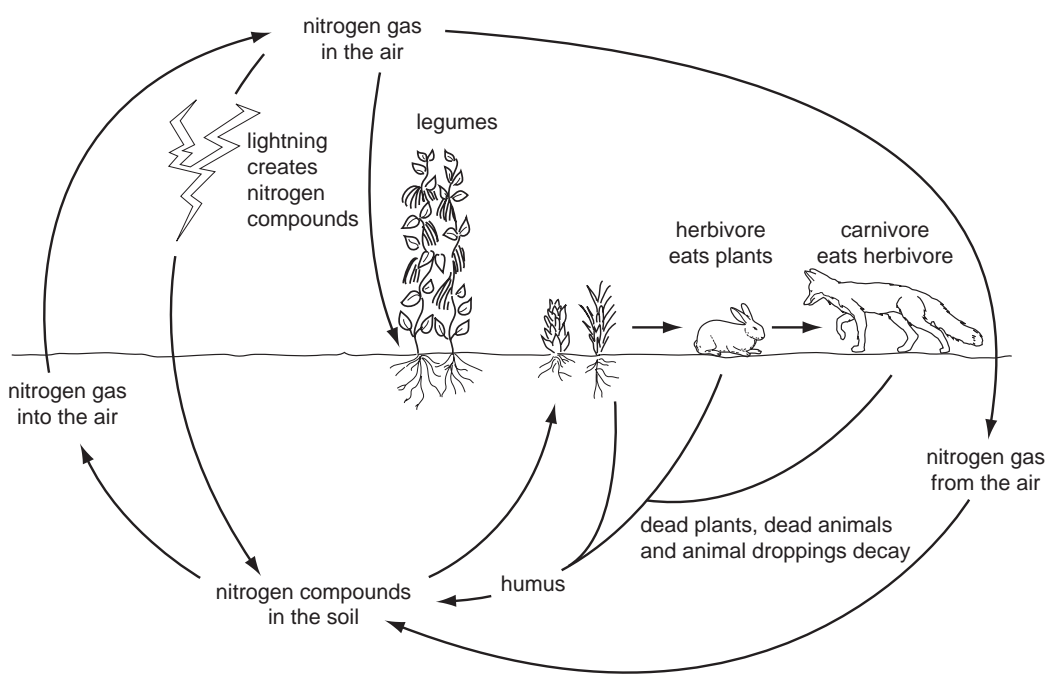
Fig. 3.1

Nitrogen fixation takes place at several places in the cycle.

(a) Write the letter **F** in **two** places on Fig 3.1 to show where nitrogen fixation occurs.

[2]

(b) Using an example, explain what is meant by crop rotation.

....

.... [2]

(c) State **two** benefits of crop rotation.

....

.... [2]

(d) Name a legume.

.... [1]

(e) Describe **two** ways in which the growth of legumes can improve soil fertility.

1 ....

2 .... [2]

[Total: 9]

For
iner's

4 **(a) (i)** Define *osmosis*.

....

....

.... [2]

(ii) A farmer applied too much fertiliser to the soil. This resulted in plasmolysis. Describe and explain how this process might have affected the appearance of the crop.

....

....

....

....

.... [4]

(b) (i) In very hot, dry weather, plants often wilt.
How may wilting prevent death of the plant?

....

.... [1]

(ii) 'Water hungry' crops are often grown close to trees or bushes. Suggest **one** way in which the trees or bushes may reduce wilting in a crop.

....

.... [1]

[Total: 8]
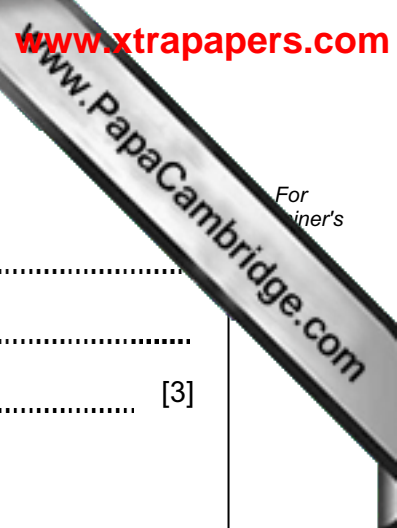
5   (a) Name **three** requirements for safe storage of grain or cereal products.

1 ....

2 ....

3 .... [3]

(b) For a named crop, describe **two** signs that the crop is ready to harvest.

Name of crop ....

1 ....

  ....

2 ....

  .... [2]

(c) Many consumers prefer organically produced crops.
In terms of food production give your justification for the use of **inorganic** fertilisers and pesticides.

....

....

....

....

.... [4]

[Total: 9]
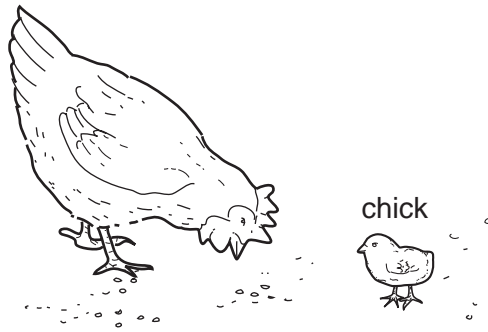
6 Fig 6.1 shows a chick and a broiler.

chick

Fig. 6.1

Broilers take 52 days to grow ready for market.
The rapid growth will only be achieved if the breeding of the chick is correct.

(a) (i) The breeding is controlled by genes. What is an allele?

.... [1]

In broilers, the dominant allele for growth is represented by **M**, whilst the recessive allele is represented by **m**.
For satisfactory growth the allele **M** is essential.

(ii) Complete the following genetic diagram.

cockerel   X   hen
MM   **Mm**

Genotype of chicks .... [2]

(iii) A breeding programme to improve growth rates by artificial selection is set up. Explain why selecting a cockerel with the genes **Mm** to mate with a hen with genes **Mm** would not be a suitable cross.

....

....

....

.... [2]

(b) Male farm animals can be castrated by having their testicles removed.

(i) Suggest **two** effects this might have on the animals.

1 ....

2 .... [2]

(ii) Before a bull can be widely used for artificial insemination (AI) the offspring are tested, and detailed records of their development are kept.
Suggest **two** reasons for this.

1 ....

....

2 ....

.... [2]

(iii) Some farmers still prefer to use a bull or a boar with their livestock.
Suggest **two** reasons for this.

1 ....

....

2 ....

.... [2]

(iv) Define *lactation*.

....

.... [1]

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

....

.... [2]

[Total: 14]

7 **(a)** Complete Table 7.1 on water supply.

Water source	Advantage	Disadvantage
deep well		high cost
shallow well	low cost	
large river	more reliable water flow	
small stream		can run dry in hot weather

Table 7.1

[4]

(b) Describe briefly how you could filter water for human and animal use.

....

....

....

....

.... [2]
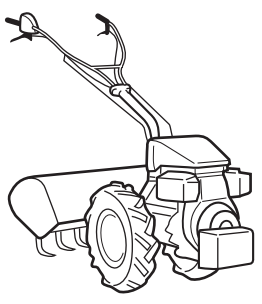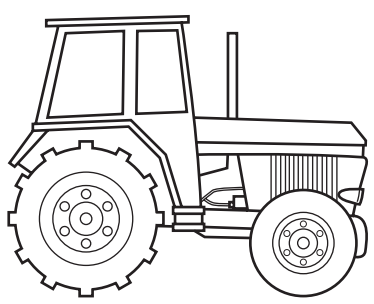
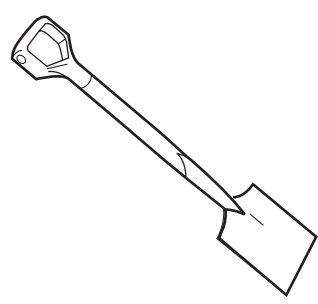**[Total: 6]**

8 The diagrams below show three different machines that could be used to in_____ productivity on a small farm.

machine A   machine B   machine C

(a) What is the purpose of any machine?

....

.... [1]

(b) (i) Which machine is the most suitable for use on a small farm in a remote area?

.... [1]

(ii) Give reasons for your answer in **(b) (i)**.

....

....

....

.... [2]

(c) (i) Which machine might be best for use by a group of farmers?

.... [1]

(ii) Give reasons for your answer in **(c) (i)**.

....

.... [1]

[Total: 6]

For
iner's

9 **(a)** Describe how you could turn unproductive land covered in weeds and scr_____ productive grassland pasture.

....

....

....

....

....

....

....

.... [4]

(b) Describe briefly **two** budgetary factors you would need to consider before deciding to clear and improve this land.

....

....

....

.... [2]

[**Total: 6**]

BLANK PAGE

16

BLANK PAGE