UNIVERSITY OF CAMBRIDGE INTERNATIONAL EX
International General Certificate of Secondary Educati

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CAN NUMBER

8946118742

ENVIRONMENTAL MANAGEMENT **0680/42**

Alternative to Coursework **May/June 2013**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler

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.

Electronic calculators may be used.

Answer **all** questions.
Study the appropriate Source materials before you start to write your answers.
Credit will be given for appropriate selection and use of data in your answers and for relevant interpretation of these data. Suggestions for data sources are given in some questions.
You may use the source data to draw diagrams and graphs or to do calculations to illustrate your answers.

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	
Total	

This document consists of **15** printed pages and **1** blank page.

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Answer **all** the questions.

World map showing location of Urugu



Map of Uruguay



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Area of Uruguay: 176 215 sq km

Population: 3.5 million

Children per woman: 1.89

Life expectancy: 76 years

Currency: Uruguayan pesos (20 = 1US$)

Language: Spanish

Climate: warm temperate, freezing temperature almost unknown

Terrain: mainly grazing plains and low hills: fertile coastal lowland

Main exports: agricultural products: beef, soybeans, rice, wheat, dairy products, wool.

The economy of Uruguay is based on exporting agricultural products. Uruguay has a well educated work force and high levels of social spending. The country managed to avoid recession during the 2008–9 global financial crisis. The capital city, Montevideo, is one of the world's best deep water ports through which agricultural products are exported.

Answer **all** the questions.

1 **(a)** Suggest two advantages of exporting goods by sea.

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.....

..... [2]

(b) 40% of the total population of Uruguay live in Montevideo.

(i) Work out the number of people living in Montevideo.

Space for working.

number of people living in Montevideo ..... [1]

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(ii) The city covers 560 sq km. Calculate the average density in Montevideo using your answer to **(b)(i)**.

Space for working.

..... [1]

(c) In 2001, children in several districts were found to have the symptoms of lead poisoning. This was confirmed by measuring the concentration of lead in the blood of some children. The concentration of lead in the blood of the children was found to be higher than expected.

Results from some of these tests of the concentration of lead in the blood of a sample of people living in one of these districts (district **1**) are shown in the table below.

	concentration of lead in the blood / μg of lead per litre of blood	
	children	adults
recommended maximum	10	25
average for people in the sample from district **1**	12.3	14.6

(i) Suggest why the recommended maximum concentration is higher for adults than for children.

.....

..... [1]

A more detailed survey of children in district **1** was carried out. The concentration of lead in the blood of samples of children of different ages is shown below.

	concentration of lead in the blood / μg of lead per litre of blood				
age / years	2	4	6	8	10
average – district **1**	14.0	12.6	12.4	12.0	11.8

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(ii) Describe the pattern shown by the results.

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(iii) What do the results suggest?

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(d) (i) The researchers wanted to make sure that the children in the sample used in the investigation into lead concentration in blood were representative of all the children in district **1**.

Describe two ways in which they could do this.

1. .....

.....

2. .....

..... [2]

(ii) The researchers investigated the lead concentration in the blood of samples of children from two other districts (district **2** and district **3**). Doctors had not reported cases of lead poisoning in children from districts **2** and **3**. The results are shown in the table.

	concentration of lead in the blood / μg of lead per litre of blood				
age / years	2	4	6	8	10
average – district **2**	9.6	8.4	8.2	8.3	8.2
average – district **3**	9.4	8.3	8.3	8.3	8.1

Compare these results with those of district **1**.

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..... [2]

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(iii) The researchers investigated possible sources of lead co

In 2001, the following main sources were identified:

- small-scale industries using and recycling le lead
- emissions from car exhausts
- people living on former landfill or industrial site
- careless disposal of wastes containing lead
- lead water pipes

The city authorities took actions after 2001 which successfully reduced the release of lead contamination into the environment.

Suggest and explain what actions the city authorities might have taken to reduce the problem of lead contamination.

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..... [3]

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(e) The researchers also tested the concentration of lead in the and pet dogs from some districts where there were no report lead poisoning. Some of the results are shown below.

	concentration of lea / μg of lead per litr		
	stray dogs	pet dog	
average for dogs or children in the sample	16.3	16.1	9.7

The researchers suggested to the city authorities that they could monitor lead contamination in any district of Montevideo by sampling the blood of stray dogs.

Explain the advantages of using dogs to monitor this kind of pollution.

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..... [2]

(f) The city authorities wanted to find out about the level of public concern about the risk of children suffering from lead poisoning. The researchers wrote a questionnaire to find out:

- about the children that people have
- about their worries about the risk of lead poisoning

1. In which district of Montevideo do you live?

2. .....

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3. .....

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4. .....

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5. .....

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(i) Complete the questionnaire above with four further questions. [4]

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(ii) What needs to be done to make the findings of the q possible?

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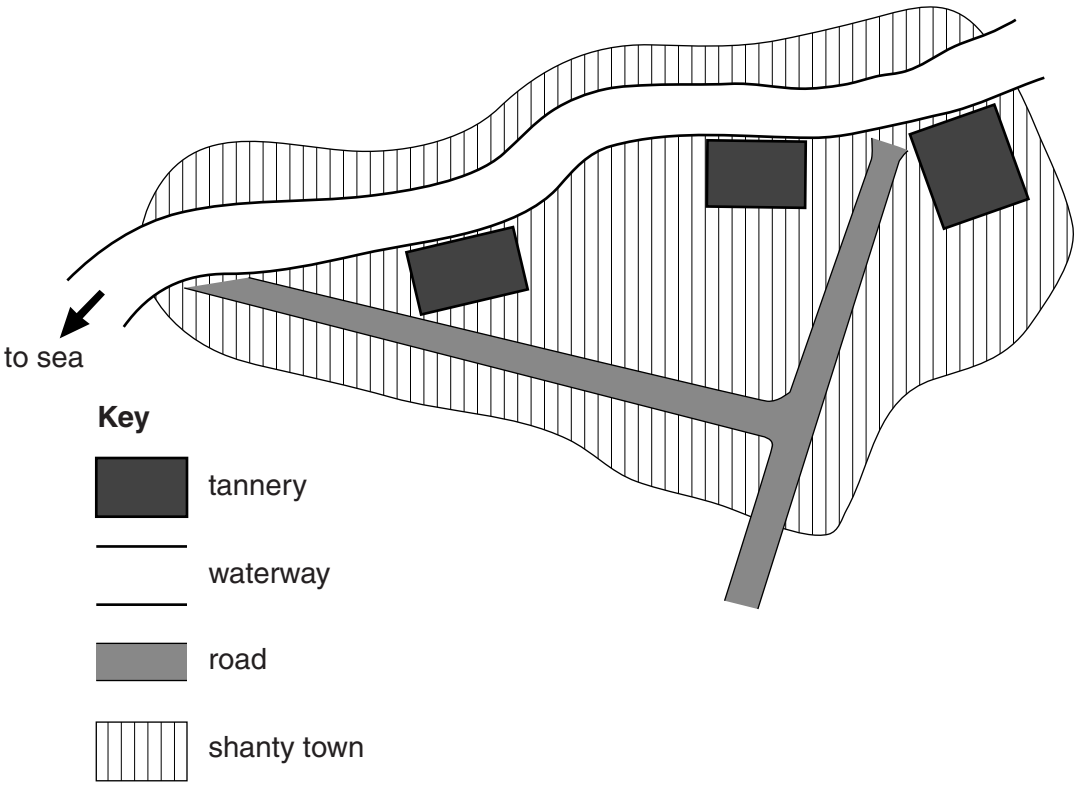
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..... [3]

(g) Cattle ranching provides large numbers of animal skins. These are turned into leather in tanneries which are found in industrial areas along waterways that lead to the sea. The waste from this process is very alkaline and contains high concentrations of the heavy metal, chromium.

Some districts of Montevideo are wealthy, some districts are less wealthy, but many people are only able to live in shanty towns. Over 400 shanty towns have grown up in Montevideo, often next to industrial areas and along waterways leading to the sea.

The map shows the location of a shanty town and some tanneries.



(i) Suggest why tanneries are often located beside waterways.

.....

..... [1]

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(ii) Draw an **X** on the map where you would expect to concentration.

Draw the **X**

(h) The table below shows climate data of Montevideo.

month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**
Rainfall /mm	70	61	102	103	81	78	70	74

(i) The risk of flooding is highest in late April. Use the climate data to suggest reasons for this.

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..... [2]

(ii) Explain why people settle in shanty towns on land like the area shown in the map despite the risk of flooding.

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..... [3]

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(iii) The city authorities want to improve half of the shanty to services. The other half they want to remove which wi people. The project is going to be expensive and will tak Suggest the factors that could be taken into account to should be improved.

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..... [4]

(iv) In order to find out the effects of chromium pollution the scientist carried out a biological survey along three waterways flowing through Montevideo to the sea.

- Waterway **A** had many tanneries beside it.
- Waterway **B** had only shanty towns beside it.
- Waterway **C** flowed through a planned built up area.

The scientist worked downstream from sample point **1** to **3** on each waterway.

Sample point **1** was inland (upstream of Montevideo), sample point **2** in the city centre and sample point **3** just before the river reached the sea.

	waterway **A**			waterway **B**			waterway **C**		
sample point	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
number of species found	15	3	4	14	4	12	16	8	15
number of biological groups	6	2	2	6	2	5	6	5	6
biodiversity index	2.4	1.1	1.1	2.3	1.1	2.2	2.4	1.6	2.4

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Describe what happened to the organisms in waterway

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(v) Suggest an explanation for why organisms in waterwa
time the water reached the sea whereas the organisms in waterway **A** had not.

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..... [3]

[Total: 39]

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2 **(a)** There are many small family farms in the south of Uruguay map on page 2) growing vegetables that are sold in Monte price of many vegetables has been decreasing. A survey fo farms responded by increasing vegetable production by up to

(i) Explain why most of the farmers responded by growing

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(ii) Explain what effect an increase in vegetable production would have on vegetable prices in Montevideo.

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..... [2]

(b) Many of the methods used by farmers are not sustainable because they do **not** use

- crop rotations
- mixed cropping
- mixed farming

Explain how each of these methods help farming become a sustainable activity.

crop rotations .....

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mixed cropping .....

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mixed farming.....

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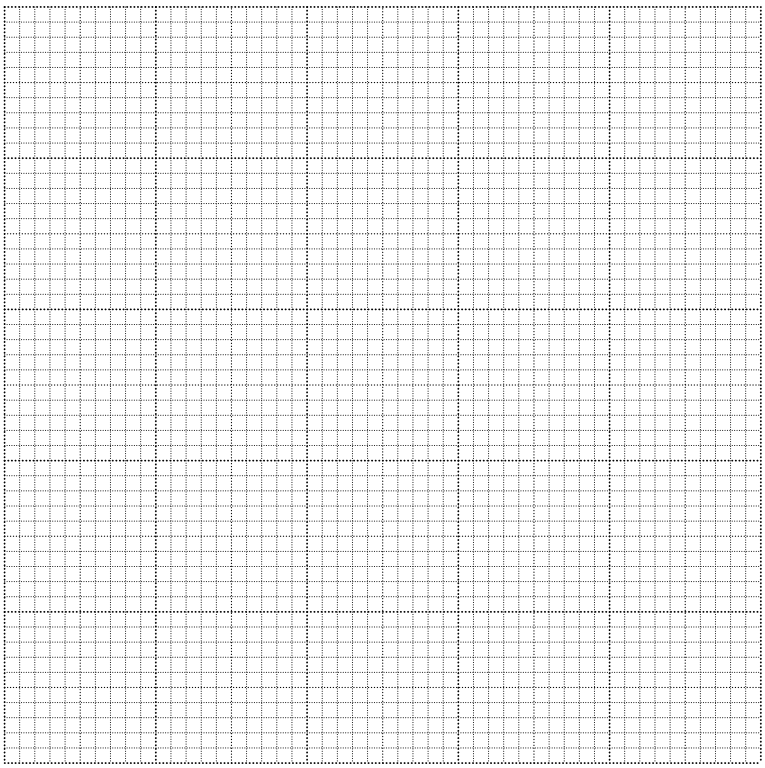
..... [5]

(c) A scientist recorded vegetable yields from two farms, **D** and **E**, in the region to assess their productivity and profitability. The results are shown on the next page.

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	yield/tonnes per h	
vegetable	farm **D**	
garlic	3	
onion	10	
squash	9	
pepper	12	
potato	14	14

(i) Plot the data on a suitable graph, to allow comparisons between yields of vegetables.



Plot the graph on the grid above. [4]

(ii) Name the vegetable which showed the largest difference in yield between the two farms.

..... [1]

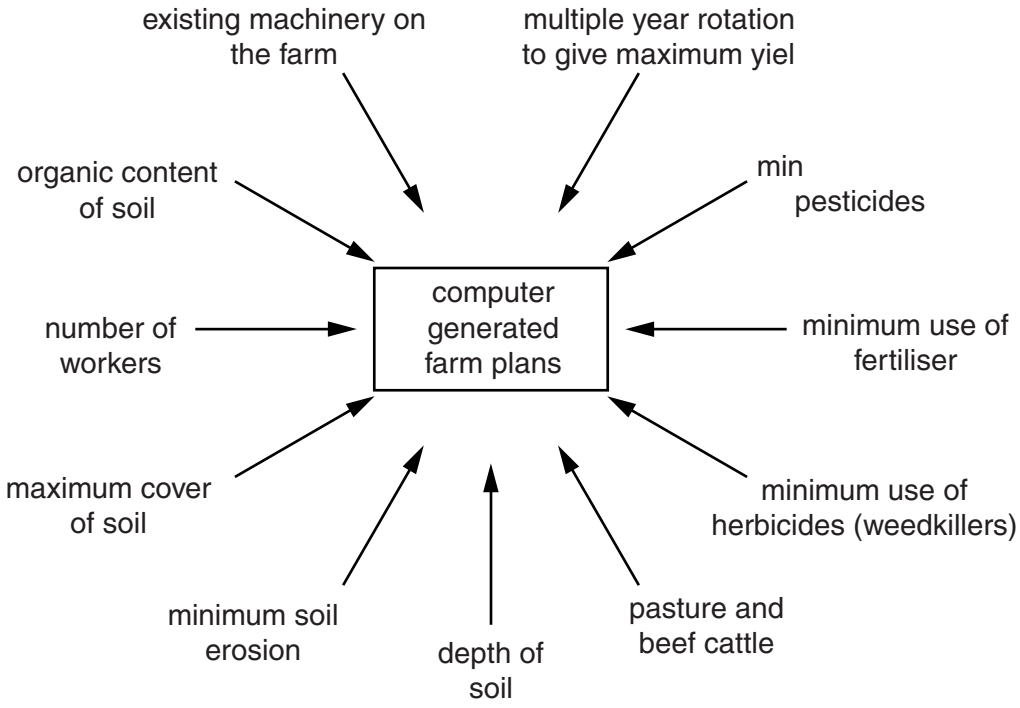
(iii) Which vegetable does not fit the general pattern shown by the yields? Suggest a reason for this.

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..... [1]

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(d) A computer programme was developed to allow the input of
are used to suggest alternative farm plans, as shown in th
these alternative plans predicted an increase in profitability
any increase in the land area used to grow vegetables.



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(i) In the space below draw a table to show the costs a far so they can work out how much profit they make.

Put the table in the space above. [3]

(ii) Some farmers wanted to use one of the farm plans but convert to organic farming. Describe some of the advantages and disadvantages of growing vegetables organically.

Advantages .....

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Disadvantages .....

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..... [4]

[Total: 21]

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