Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

8781092338

ENVIRONMENTAL MANAGEMENT **0680/23**

Paper 2 **October/November 2018**

1 hour 45 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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **both** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

This document consists of **16** printed pages.

CAMBRIDGE International Examinations

1 The table shows the percentage change in the world total production and percentage change in area cultivated for 9 crops in the last 30 years.

crop	percentage change in total production	percentage change in area cultivated
barley	–3	–35
maize	95	29
millet	32	–5
oats	–45	–60
potato	10	–5
rice	81	14
sorghum	–5	–1
sweet potato	–22	–27
wheat	61	–1

(a) (i) Rank the three crops with the greatest percentage increase in total production over the past 30 years from highest to lowest.

	rank	crop
highest ↓	1st	
	2nd	
lowest	3rd	

[2]

(ii) Identify the crop which has the greatest percentage decrease in both total production and area cultivated.

.....[1]

(iii) Suggest **two** reasons why the total production and area of cultivation for a crop might decrease.

1 .....

.....

2 .....

.....

[2]

(iv) Give reasons for the significant change in the quantity of rice produced during this 30-year period.

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.....[4]

(b) Some scientists think that the way to meet the predicted demand for more food in the future is by improving the management of the soil.

One suggestion is to improve the soil characteristics so that the soil provides the ideal conditions for crop growth.

(i) Complete the table with information that would help achieve this.

soil characteristic	**how the change could be made**
nutrient content	....
soil pH	....
drainage	....

[3]

(ii) Changing the soil characteristics will only benefit the crops if the soil is properly aerated.

Explain why soils must be aerated for good crop growth.

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.....[2]

(iii) Give **two** ways in which the aeration of the soil may be damaged.

1 .....

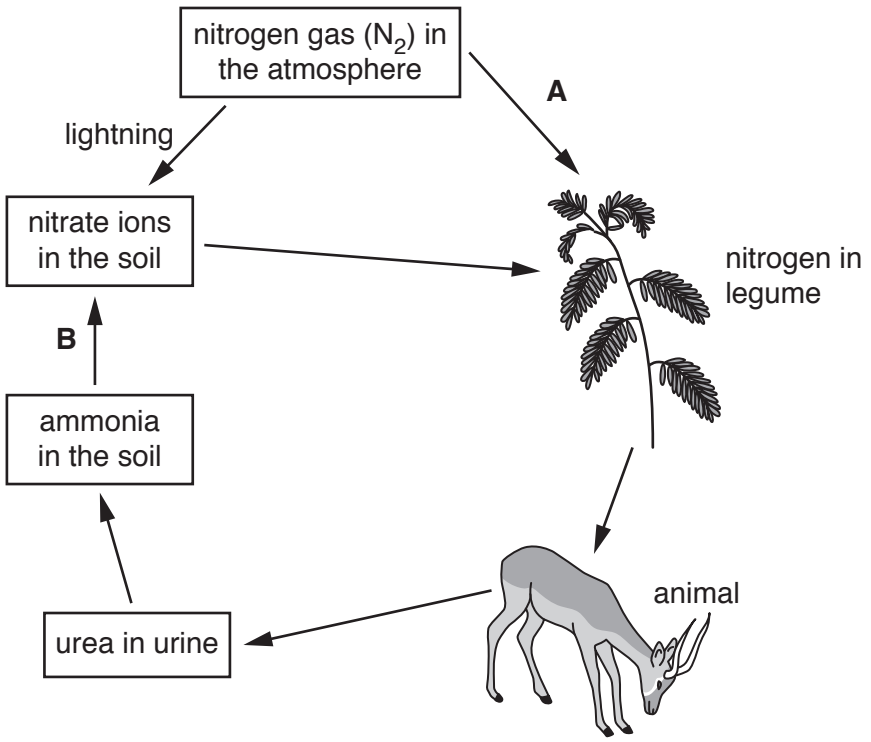
.....

2 .....

.....

[2]

(c) The diagram shows part of the nitrogen cycle.



(i) Name the process that occurs at **A** and the process that occurs at **B**. Choose from these words.

decay **fixation** **nitrification** **respiration**

A .....

B .....

[2]

(ii) Nitrogen is found in proteins.

Give one way in which animals obtain protein.

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.....[1]

(iii) Nitrates in the soil are very soluble and easily washed into rivers and lakes.

Describe the impact this nitrate may have on the rivers and lakes.

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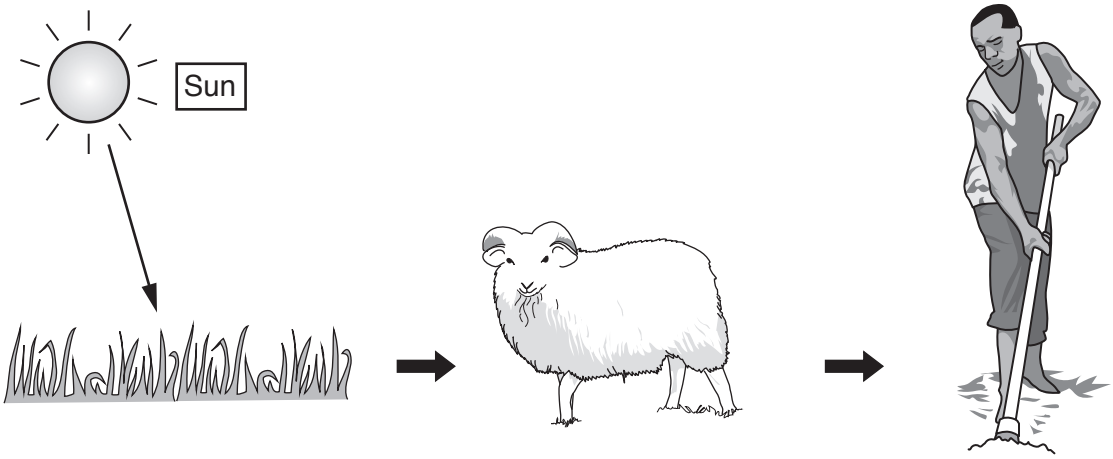
.....[4]

(d) The diagram shows part of a food web on a farm.



(i) State which organism in the diagram is the producer.

.....[1]

(ii) The energy transfer between trophic levels is 10%.

Calculate the percentage of energy contained within the grass that will be present in the farmer.

.....% [1]

(iii) Give **three** ways in which energy may be lost between trophic levels.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(iv) Describe the process used by plants to capture and store energy from the Sun.

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.....[3]

(e) A magazine article suggests that the way to meet future food production targets is for the world population to become vegetarian.

> **SAVE THE PLANET – STOP EATING MEAT**
>
> **Laws should be passed to make people vegetarian**
>
> The resources used to produce a meat-based diet for one person could feed 10 vegetarians.
>
> Fewer cattle and sheep would mean less methane gas to affect global warming.
>
> Forest will need to be cleared to produce more meat.
>
> Livestock need water, which would be more efficiently used to water crops.
>
> Some of the food produced is currently wasted.

(i) The article states that laws should be passed to make people vegetarian.
To what extent do you agree with this statement?
Give reasons for your answer.

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.....[6]

(ii) Many people think that forests should **not** be cleared for food production.

Suggest why some governments decide to allow forests to be cleared.

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.....[3]

2 Minerals and fossil fuels are non-renewable resources.

(a) (i) State **two** economic advantages of mineral extraction to a local community.

1 .....

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2 .....

.....

[2]

(ii) Suggest **three** reasons why mining might stop in a location.

1 .....

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2 .....

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3 .....

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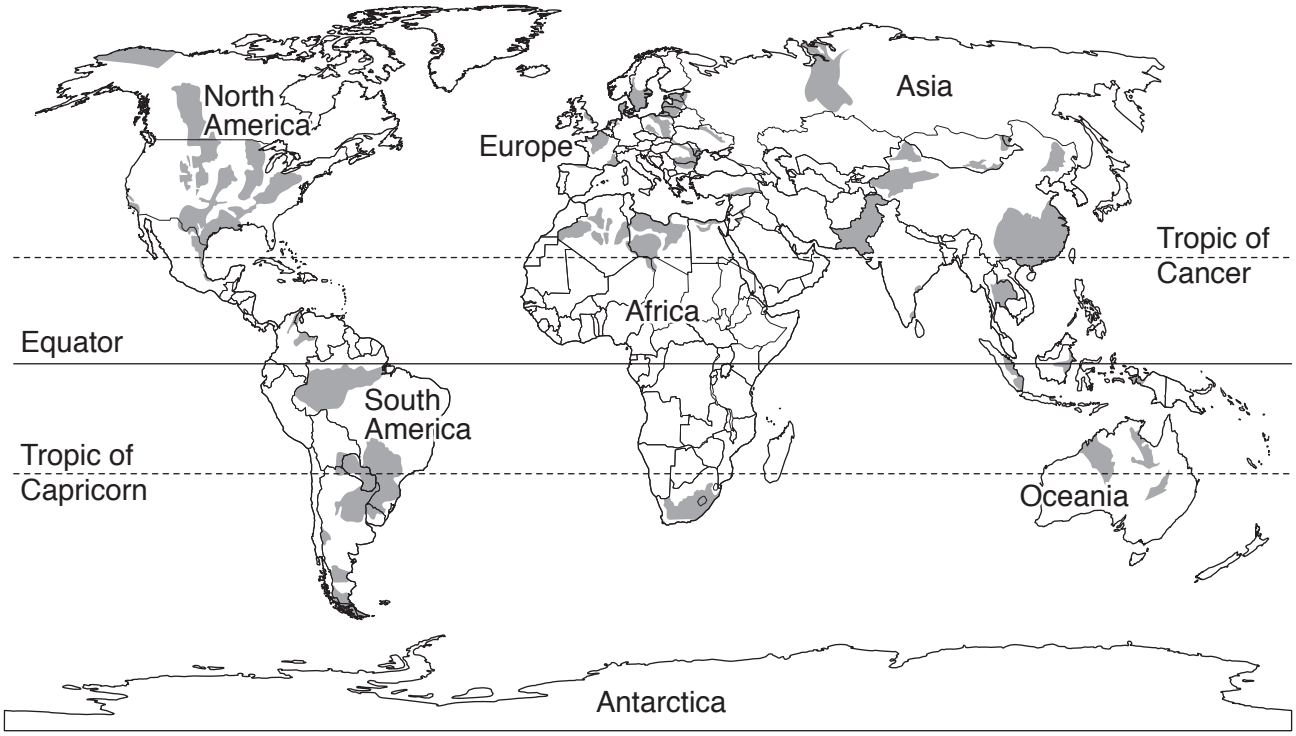
[3]

(iii) Oil and gas can be found in a sedimentary rock called shale.
The map shows the location of known shale oil and shale gas reserves.



Key

shale oil and shale gas reserves

Describe the location of the known shale oil and shale gas reserves.

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.....[2]

(iv) It is thought that there may be further land-based reserves of shale oil and shale gas.

Suggest **two** reasons why they have not yet been discovered.

1 .....

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2 .....

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[2]

(b) (i) Some of the current reserves of oil are now close to depletion.

Describe how this may affect the global economy.

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.....[4]

(ii) Scientists have identified large oil reserves in Antarctica.

Governments have signed a treaty to prevent the exploitation of oil in Antarctica.

Suggest why this decision has been made even though oil and gas shortages are predicted.

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.....[1]

(c) Government decisions on energy generation need to balance a range of factors.

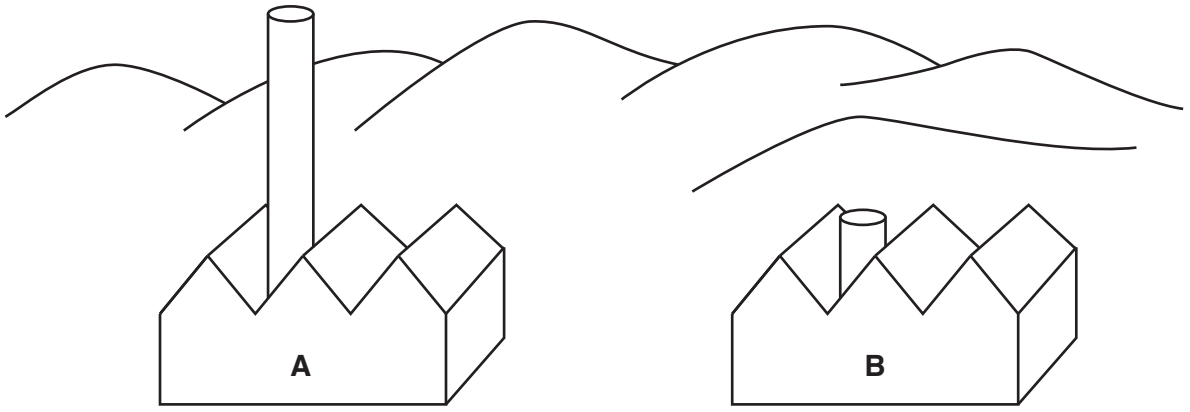
Complete the table to compare the use of fossil fuels with nuclear energy to generate electricity.

	economic advantage	**environmental advantage**
fossil fuels	.....	.....
	.....	.....
	.....	.....
	.....	.....
nuclear	.....	.....
	.....	.....
	.....	.....
	.....	.....

[4]

(d) Plans have been approved to allow the development of a coal-burning power station on the edge of an area of natural beauty.

Two alternative chimney designs, **A** and **B**, have been suggested.



(i) Give **two** reasons why chimney design **A** is more likely to disperse waste gases faster than chimney design **B**.

1 .....

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2 .....

.....

[2]

(ii) Explain **two** strategies the owners of this new coal-burning power station could use to reduce the impact of the waste gases.

strategy 1 .....

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strategy 2 .....

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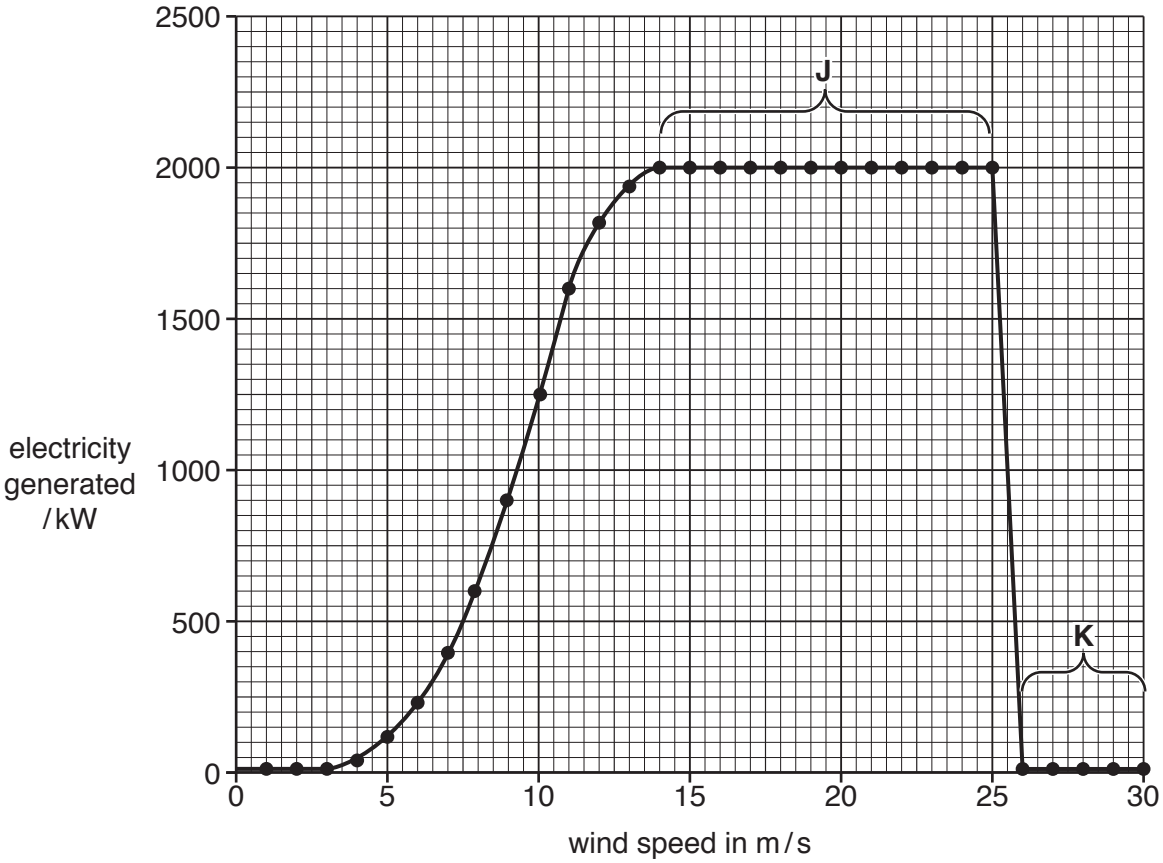
[4]

(e) Engineers have measured the power production from a wind turbine at different wind speeds.

The graph shows the data collected.



(i) Describe and explain the results shown in zones **J** and **K**.

zone **J** .....

.....

.....

.....

zone **K** .....

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[4]

(ii) In the location of the wind turbine, the wind speed was measured over a 24-hour period. The maximum wind speed was 10 m/s.

Describe the effectiveness of this wind turbine in generating electricity during this 24-hour period.

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.....

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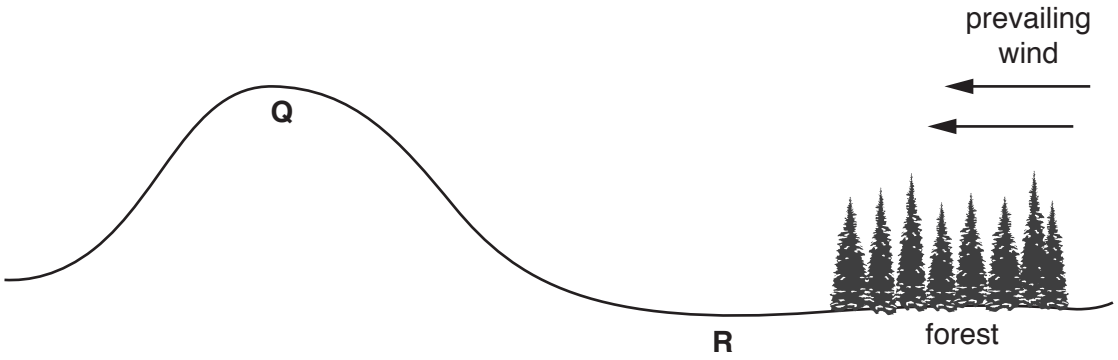
.....[2]

(iii) Two alternative locations for a wind turbine are shown in the diagram.



Suggest **two** reasons why site **Q** is a better location for a wind turbine than site **R**.

1 .....

.....

2 .....

.....
[2]

(iv) State **two** renewable energy sources other than wind.

1 .....

2 .....
[2]

(f) When mining or quarrying is completed, the environment is damaged.

'Allowing natural processes such as vegetational succession to restore a damaged environment is as effective as a managed conservation scheme.'

How far do you agree with this statement?

Explain your answer.

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.....[6]