Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

5497282150

ENVIRONMENTAL MANAGEMENT **5014/11**

Paper 1 **October/November 2018**

2 hours 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 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 **all** 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.

Write your answers in the spaces provided on the Question Paper.
All questions in Section A carry 10 marks.
Both questions in Section B carry 40 marks.

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 **25** printed pages and **3** blank pages.

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CAMBRIDGE International Examinations

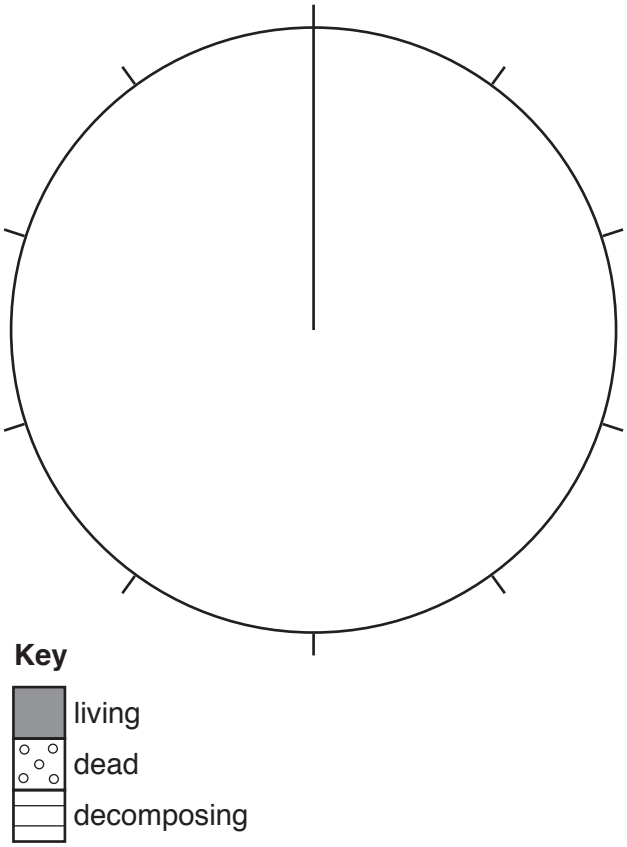
Section A

Answer **all** the questions.

1 **(a)** The table shows the average percentages of types of organic matter in the soil.

(i) Complete the pie graph, using the table and key provided.

type of organic matter	average percentage
living	3
dead	9
decomposing	88



[3]

(ii) State **one** type of living soil organism that consumes dead organic matter.

.....[1]

(iii) State **one** type of living soil organism that decomposes organic matter.

.....[1]

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(iv) Name **two** components of soil other than organic matter.

1 .....

2 .....
[2]

(b) Explain why growing grass improves the soil.

.....

.....

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.....[3]

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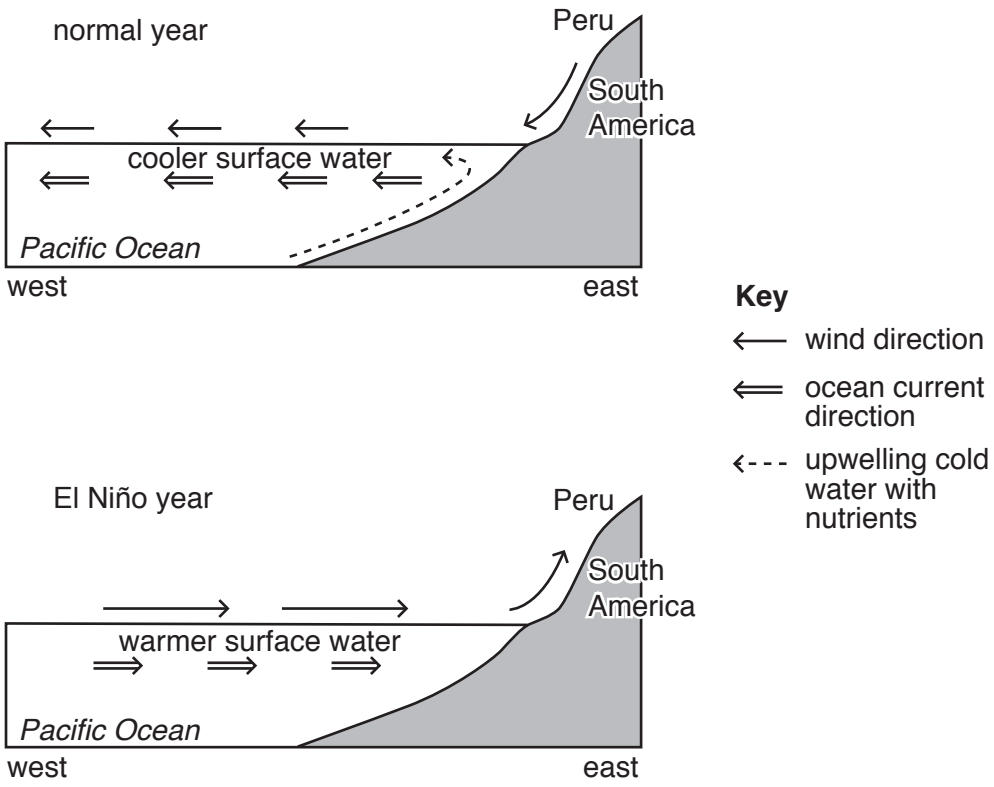
[Turn over

2 **(a)** The diagram shows conditions in the eastern Pacific Ocean in a normal year and in an El Niño year.



(i) Use the diagram to give **one** reason why the surface ocean current flows westwards from Peru in normal years.

.....

.....[1]

(ii) State how the weather in Peru will differ from normal in an El Niño year.

.....

.....

.....

.....[2]

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(iii) Use the diagram and your own knowledge to explain why Peru has a good fish catch in a normal year.

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.....[3]

(iv) Describe why more fish die in an El Niño year compared with a normal year.

.....

.....[1]

(b) There are disputes between countries in some parts of the world about who owns areas of ocean.
Suggest reasons why.

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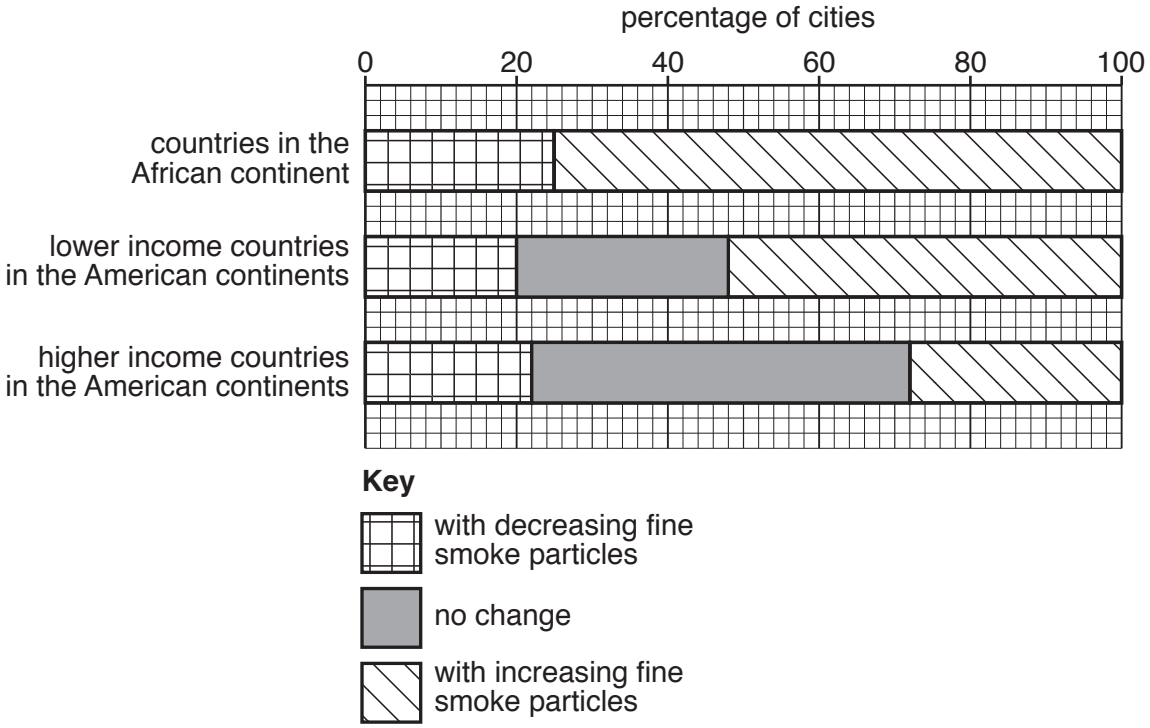
.....[3]

3 **(a)** The graph shows the percentage of cities in selected countries that have increasing and decreasing concentrations of fine smoke particles in the atmosphere.



(i) State the percentage of cities from countries in the African continent that have an increasing concentration of fine smoke particles in the atmosphere.

.....% [1]

(ii) Compare the levels of increasing fine smoke particles from lower and higher income countries in the American continents.

.....

.....

.....

.....[2]

(iii) Describe how fine smoke particles in the atmosphere damage people's health.

.....

.....[1]

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(b) Explain why cities have more air pollution than rural areas.

.....

.....

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.....

.....[3]

(c) Suggest why it is difficult to control air pollution in developing countries.

.....

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.....[3]

4 **(a)** The photograph shows vegetational succession in an area where vegetation is regrowing.

(i) Complete the table by writing in the letters **A**, **B** and **C** to match the stages in the vegetational succession.

area	description of stage in vegetational succession
.....	vegetational succession is being stopped
.....	vegetational succession has been happening for a long time
.....	vegetational succession has been happening for a shorter time

[2]

(ii) State the type of farming that is taking place in area **C** in the photograph.

.....[1]

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(b) (i) Describe how the vegetation in the final stage of a vegetational succession differs from earlier stages.

.....

.....

.....

.....

.....

.....[3]

(ii) Describe how seed dispersal can influence a vegetational succession.

.....

.....[1]

(c) Suggest how allowing natural vegetation to regrow will change the ecosystem.

.....

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.....[3]

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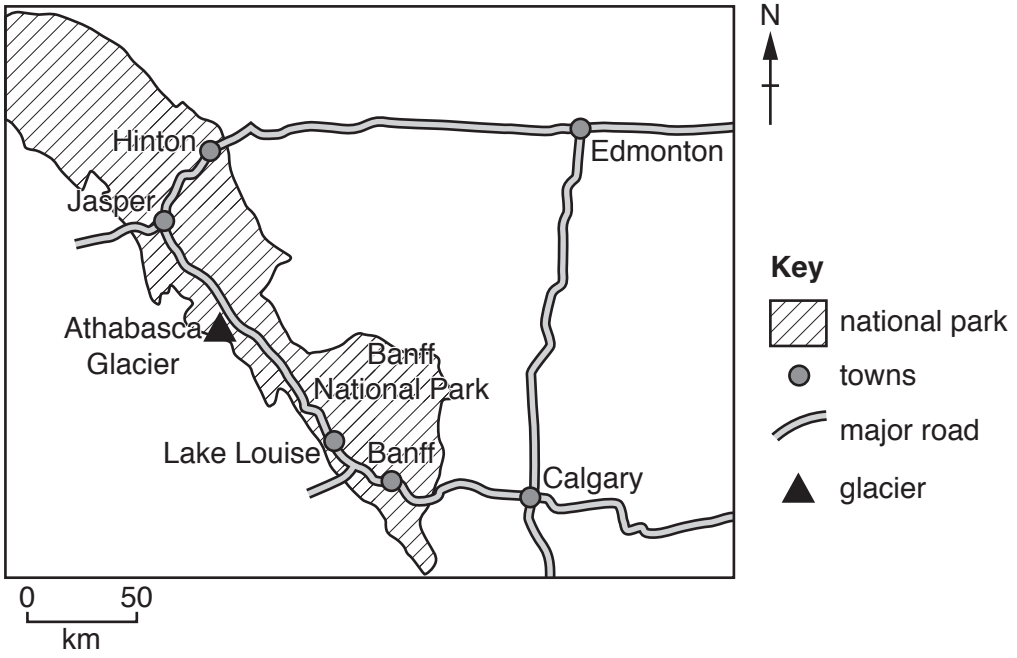
[Turn over

Section B

Answer **both** questions.

5 The map shows Banff National Park in the Rocky Mountains of Canada. The park contains 6641 km^2 of protected wilderness area, with mountains, glaciers and dense coniferous forest. The park has approximately four million visitors every year.



(a) (i) Suggest possible benefits and negative impacts of tourism on national parks.

benefits.....

.....

.....

.....

negative impacts .....

.....

.....

.....

[4]

(ii) State **two** strategies for reducing the impact of tourism on national parks.

1 .....

.....

2 .....

.....

[2]

(b) In October 2014, a small earthquake occurred near Banff National Park.

Suggest why people live in earthquake zones even though there is a risk to their safety.

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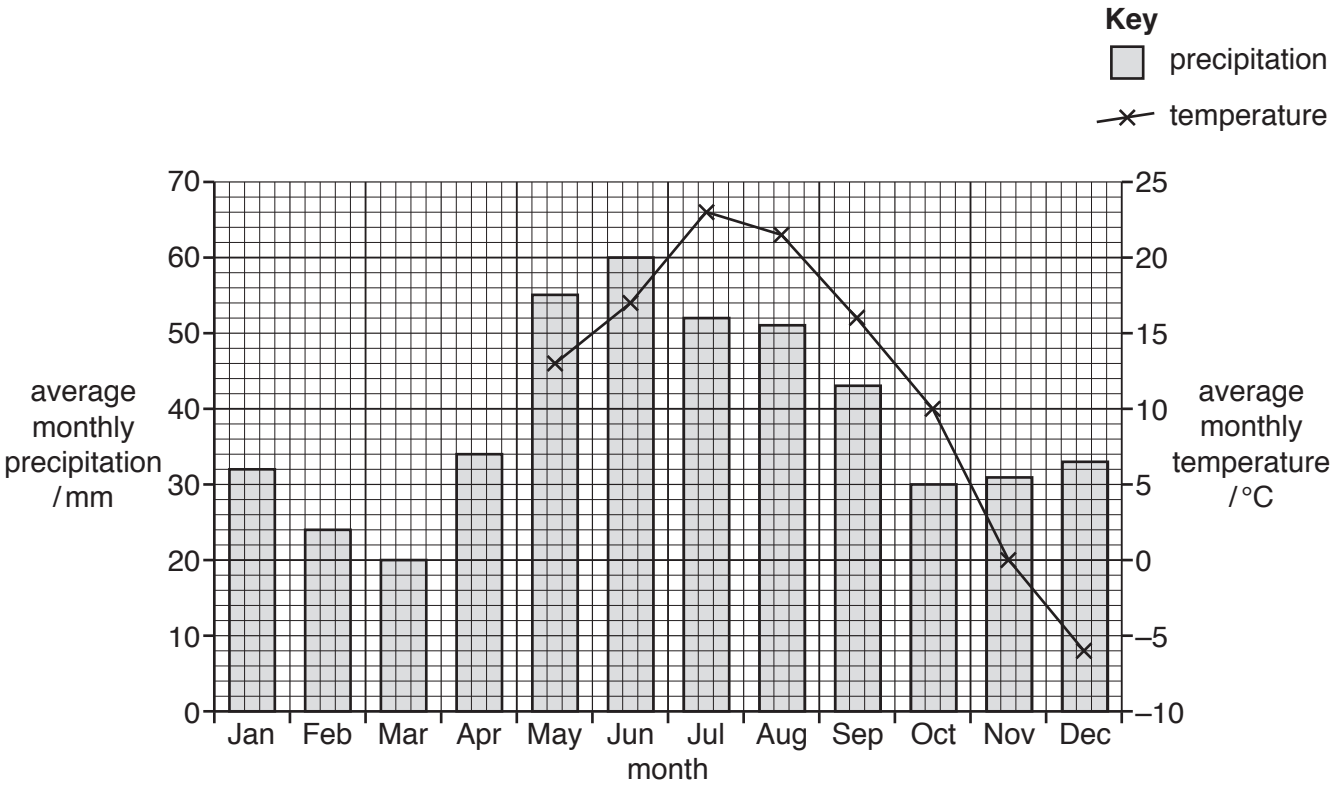
.....[4]

(c) The graph shows climate data for Banff National Park.



(i) Use the data in the table to complete the climate graph.

month	Jan	Feb	Mar	Apr
average monthly temperature / °C	–5	0	4	8

[2]

(ii) Calculate the average annual range in temperature.

..... °C [1]

(iii) Calculate the total precipitation in the wettest three months.

..... mm [1]

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(iv) Use the graph to describe the pattern of temperature and precipitation in Banff National Park.

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..... [4]

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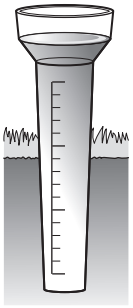
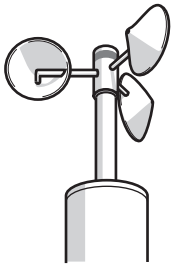
[Turn over

(v) The diagram shows instruments used for measuring elements of weather.

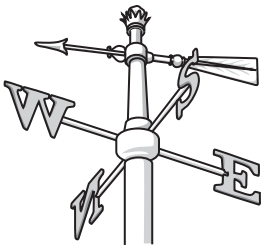


A



B

C



D

Complete the table to identify the names of the instruments and the element of weather each instrument measures.

instrument letter	element of weather that the instrument measures	name of instrument
A	.....	.....
B	.....	.....
C	.....	Campbell-Stokes recorder
D	wind direction	.....

[4]

(vi) In June 2013, 200 mm of rain fell in less than two days in Banff National Park. The rainfall caused major flooding of many rivers.

Describe the problems for people when rivers flood.

.....

.....

.....

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.....[4]

(d) The Columbia Icefield is located in the far north-west of Banff National Park. The Athabasca Glacier is a glacier in the icefield.

A glacier is a thick ice-mass that formed thousands of years ago.

The photograph shows the position of the Athabasca Glacier in 1935 and its position in 2016.

The glacier has retreated more than one kilometre since 1935.

Suggest why the glacier has retreated since 1935.

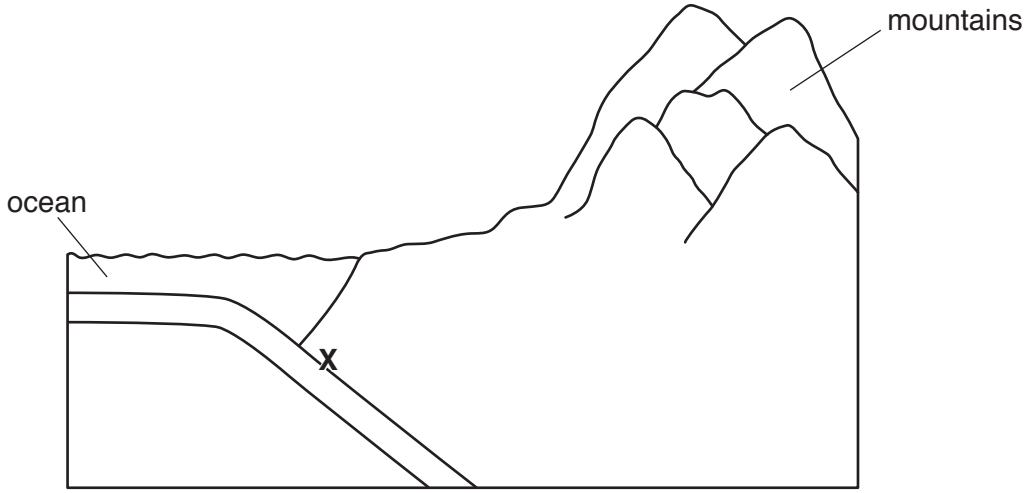
.....

.....

.....

.....[2]

(e) The diagram is a cross-section of a type of plate boundary near Banff National Park.



(i) Add labels **A**, **B**, **C** and **D** to the diagram to match the list given.

A oceanic crust
B continental crust
C mantle
D trench

[4]

(ii) State the name of the zone marked with an **X**.

.....[1]

(iii) On the diagram, draw arrows to show the direction of movement of the two plates. [1]

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[Turn over

(f) Some areas of Banff National Park have geothermally heated groundwater.

'Geothermal energy could be used as a global alternative to fossil fuels.'

To what extent do you agree with this statement? Explain your answer.

.....

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.....[6]

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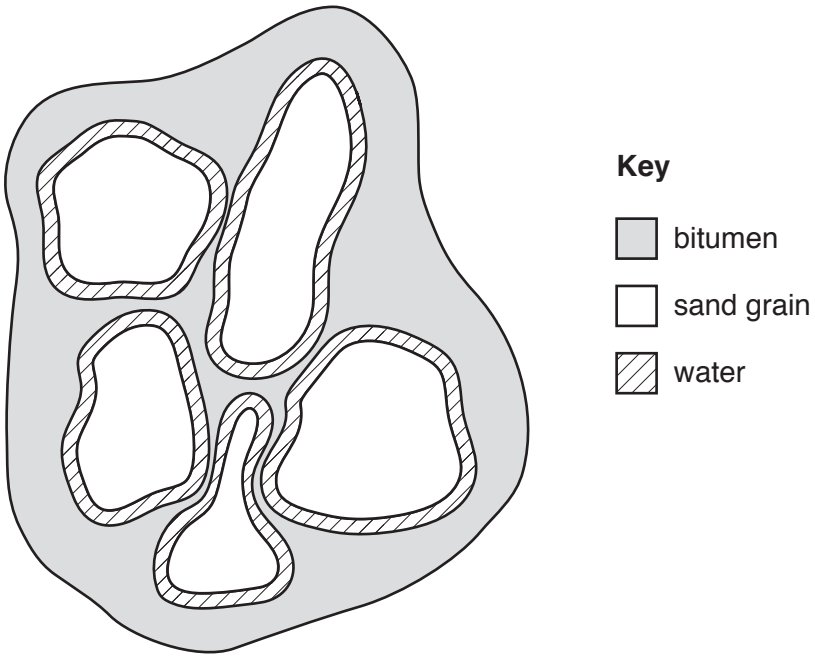
6 **(a)** The fact sheet contains information about oil sand.

Oil sand contains a mixture of approximately 90% clay, sand and water and about 10% bitumen.

Each grain of sand in the oil sand is surrounded by a layer of water and a layer of bitumen.



Bitumen is one component of petroleum (crude oil). Unlike crude oil, which can be extracted directly from the ground, the bitumen in oil sand has to be separated from the sand before it can be used. Once separated from the oil sand, the bitumen is processed in oil refineries to produce fuels such as gasoline (petrol) and diesel.

Deposits of oil sand are found all over the world, including Canada, United States of America, Russia and Venezuela. Many of the oil sand deposits are buried deep underground.

(i) Name the useful component in oil sand that can be processed to form a fuel.

.....[1]

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(ii) Suggest why extracting the useful component from oil sand is **not** economically viable.

.....

.....

.....

.....[2]

(b) Crude oil is a fossil fuel.

Describe the formation of crude oil.

.....

.....

.....

.....

.....

.....[3]

(c) The oil sand deposits in Canada are covered by forest.

The forest must be cleared before the oil sand can be mined.

(i) Describe the negative impacts of deforestation on an area of land.

.....

.....

.....

.....

.....

.....[3]

(ii) The wood from forests is used for timber.

State **one** way timber can be used more efficiently so that forests do not need to be cut down to provide the timber.

.....[1]

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[Turn over

(iii) A worker at a local forest said,

'Forests can be managed sustainably.'

To what extent do you agree with this statement? Give reasons for your answer.

.....

.....

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.....

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.....

.....[4]

(d) The information is about an environmental disaster in Canada.

> In 2016, a wildfire destroyed a huge area of forest near the oil sand deposits in Alberta, Canada. The wildfire covered an area of more than 590 000 hectares and burned for two months.
>
> The intense heat destroyed the roots of many trees. Clouds of ash were in the air for days and the smoke from the fires turned the sky black during the daytime. Large volumes of sulfur dioxide were emitted into the air during the fires.
>
> The local government declared a state of emergency and forced nearly 90 000 people to evacuate the area during the fires. More than 1000 fire fighters, 45 helicopters, 138 fire engines and 22 aeroplane water tankers fought the fires.
>
> About 2500 homes were completely destroyed and many more were damaged. Power and water supplies were disrupted. Despite this, only a very small number of people were killed during the wildfires.

(i) Suggest how people living in the area of the wildfires were affected by this environmental disaster.

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.....[4]

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(ii) The wildfire damaged the ecosystem of the area.

State the meaning of the term *ecosystem*.

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.....[2]

(iii) Suggest the problems that this wildfire caused for the environment.

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.....[5]

(iv) Evaluate the success of the local government's response to the wildfires.

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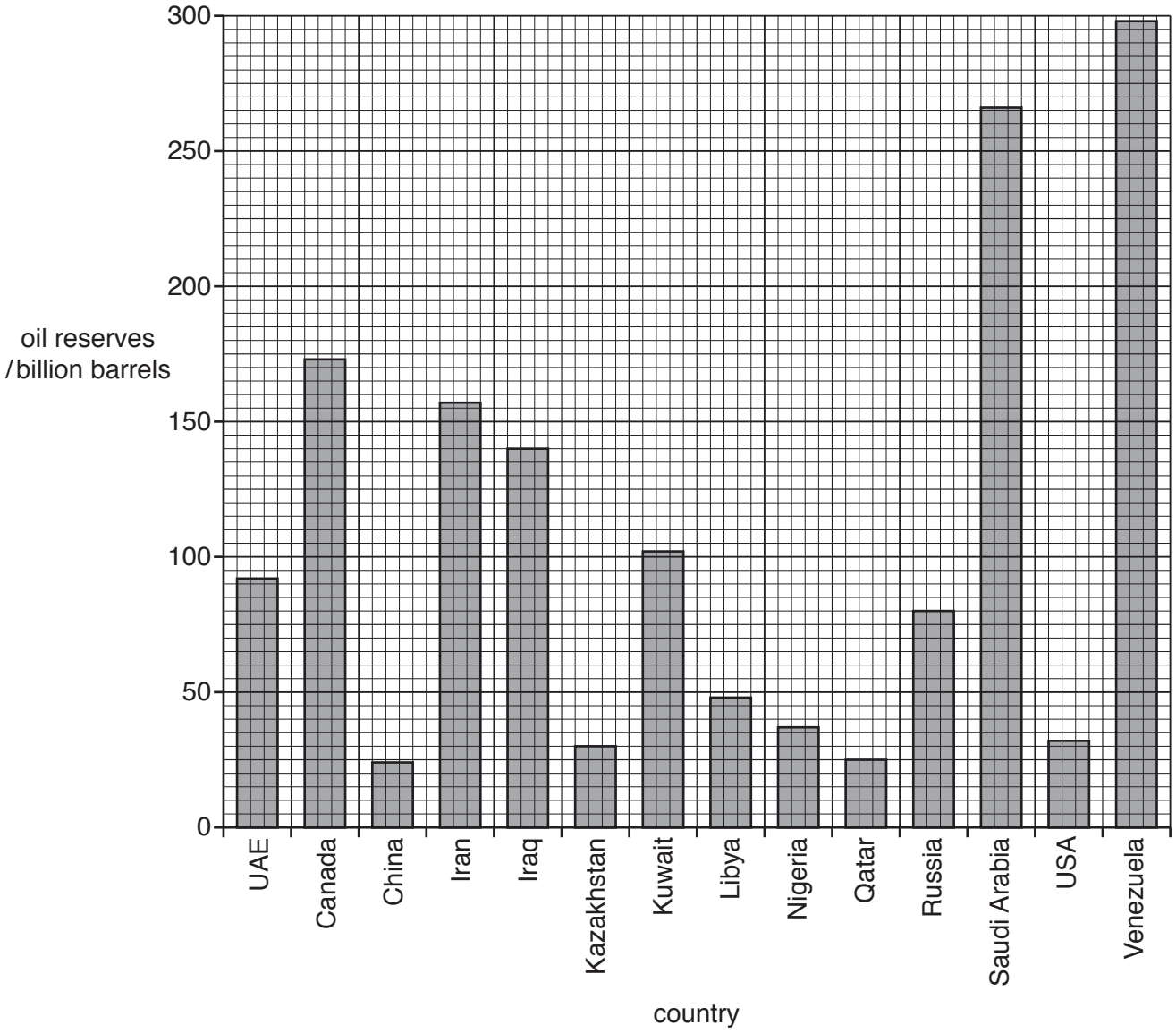
.....[4]

(e) The graph shows the global reserves of crude oil in 2013 for some countries.



(i) State the amount of oil reserves in Canada.

..... billion barrels [1]

(ii) Name **one** country with more oil reserves than Canada.

..... [1]

(iii) The value for oil reserves in Canada includes 168 billion barrels from oil sand deposits.

Calculate the percentage of Canada's oil reserves that come from oil sand deposits.

..... % [1]

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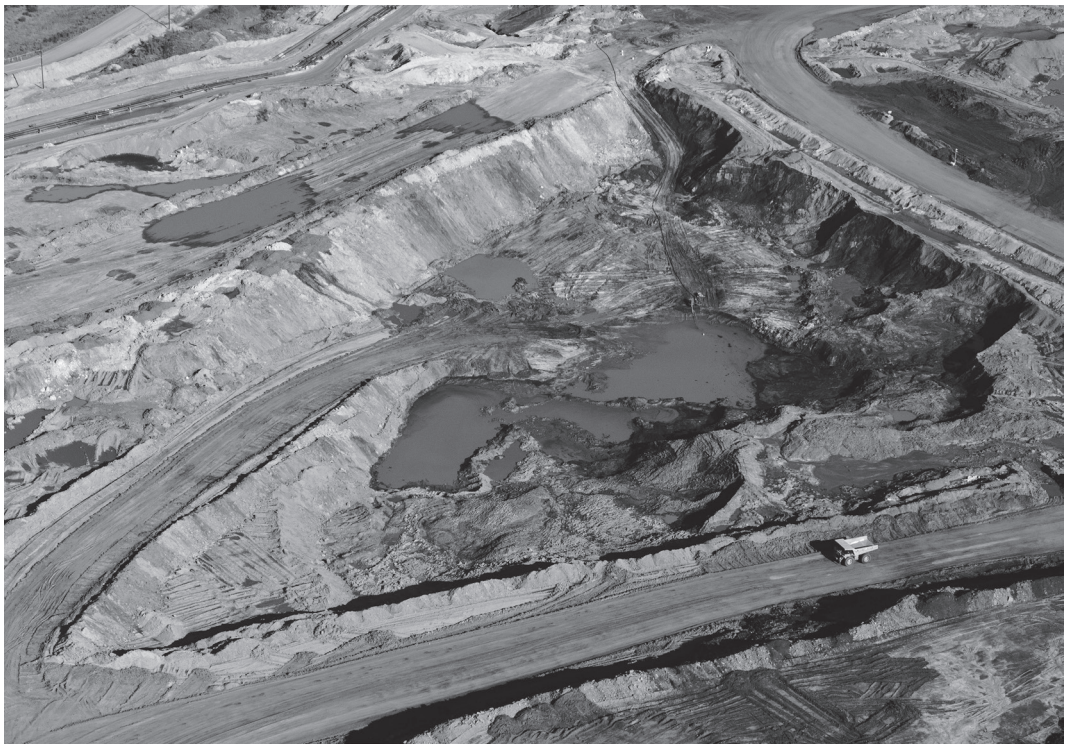
(f) The photograph shows surface mining at an oil sand deposit.



(i) Describe how the mining company can restore the land after mining has finished at this location.

.....

.....

.....

.....[2]

(ii) The mining company wants to expand the oil sand mine. Some local people are against this plan.

The local government has decided to allow the expansion of the mine.

To what extent do you agree with this decision? Give reasons for your answer.

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.....[6]

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