CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 **October/November 2016**

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.

[Turn over

1 **(a)** Look at the map below, which shows the tundra biome.

Arctic Circle

North America

Europe

Asia

Tropic of Cancer

Africa

Equator

South America

Tropic of Capricorn

Oceania

Key
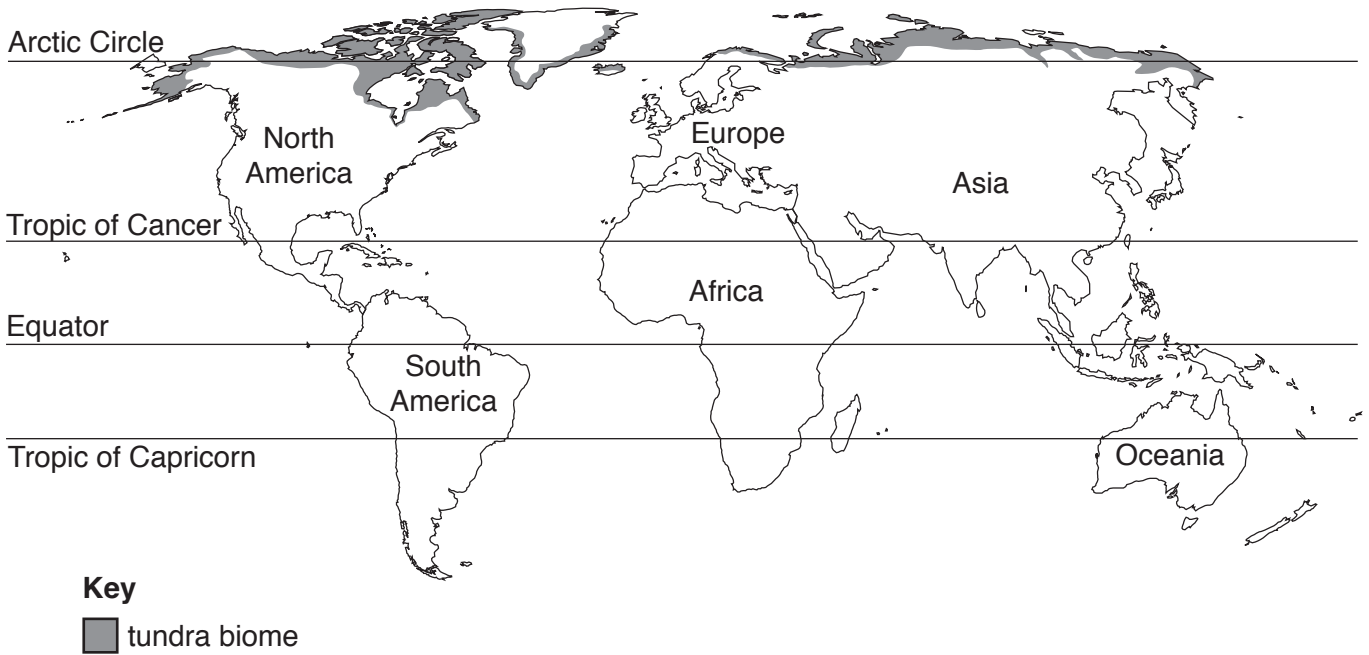
☐ tundra biome

(i) Describe the distribution of the tundra biome shown on the map.

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....[3]

(ii) Increases in greenhouse gases are thought to cause global warming. Suggest what might happen to the area of tundra biome shown on the map if global warming continues.

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....[1]

(iii) Name **two** gases that contribute to global warming. For each gas, state a human activity that is causing the amount of that gas to increase in the atmosphere.

name of gas 1: ....

human activity 1: ....

name of gas 2: ....

human activity 2: ....[4]

(b) Look at the climate graph and data below, which show the temperature and precipitation for a weather station in the tundra region of Alaska.
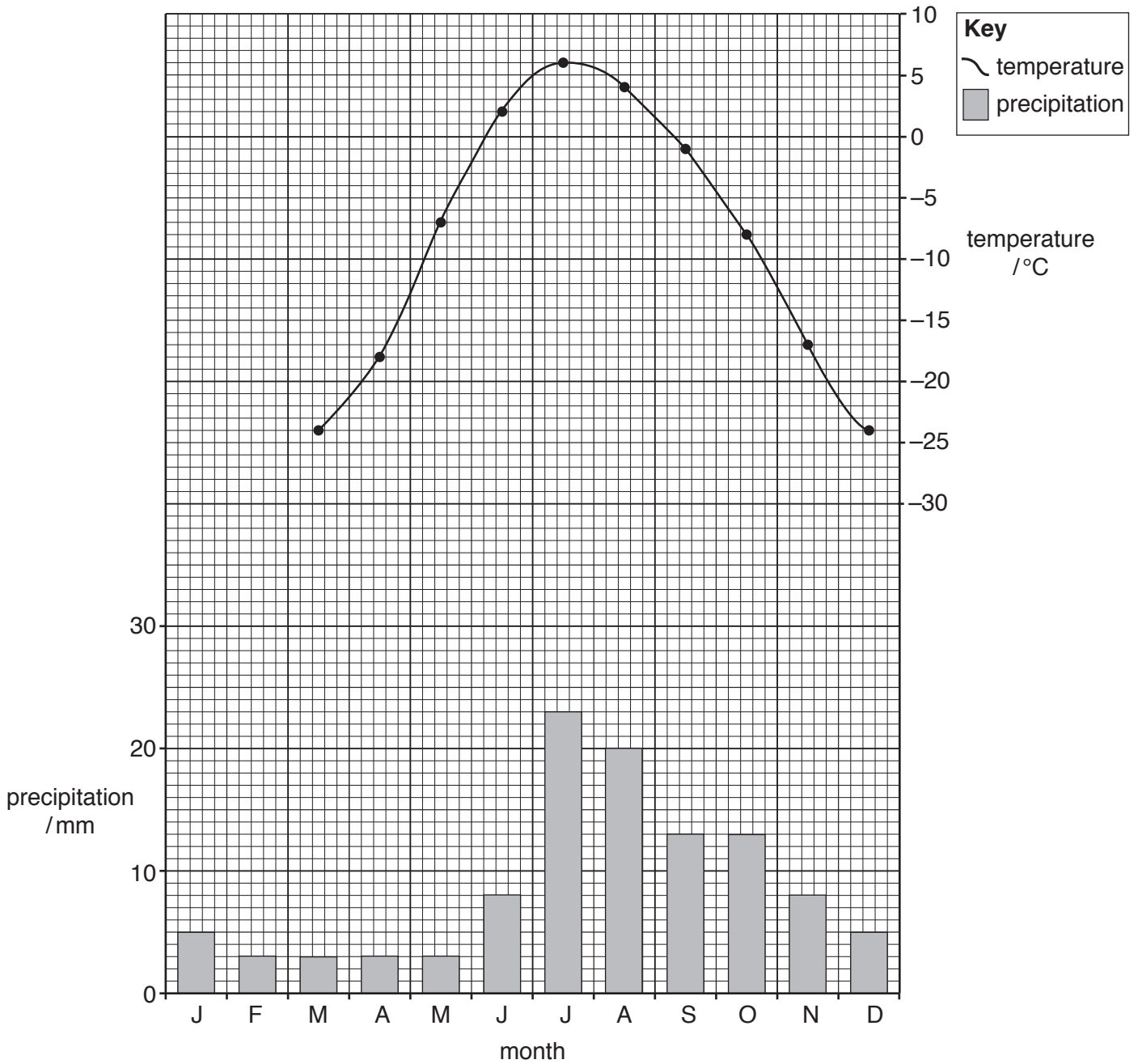
month	J	F	M	A	M	J	J	A	S	O	N	D
temperature /°C	−26	−28	−24	−18	−7	2	6	4	−1	−8	−17	−24
precipitation /mm	5	3	3	3	3	8	23	20	13	13	8	5

(i) Using the data in the table, complete the temperature line graph for January and February. [2]

4

(ii) Look again at the climate graph and data on page 3 and complete the information in the table below. [3]

number of months below freezing	.... months
the month with the highest precipitation	....
annual temperature range	.... °C

(iii) The tundra climate has very cold winters and cool summers and there is little precipitation. Most precipitation falls as snow. It is also windy and there is little daylight in the winter.

Describe and explain **two** ways in which plants have adapted to survive these harsh conditions.

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....[4]

(c) Look at the diagram below, which shows part of a tundra ecosystem.
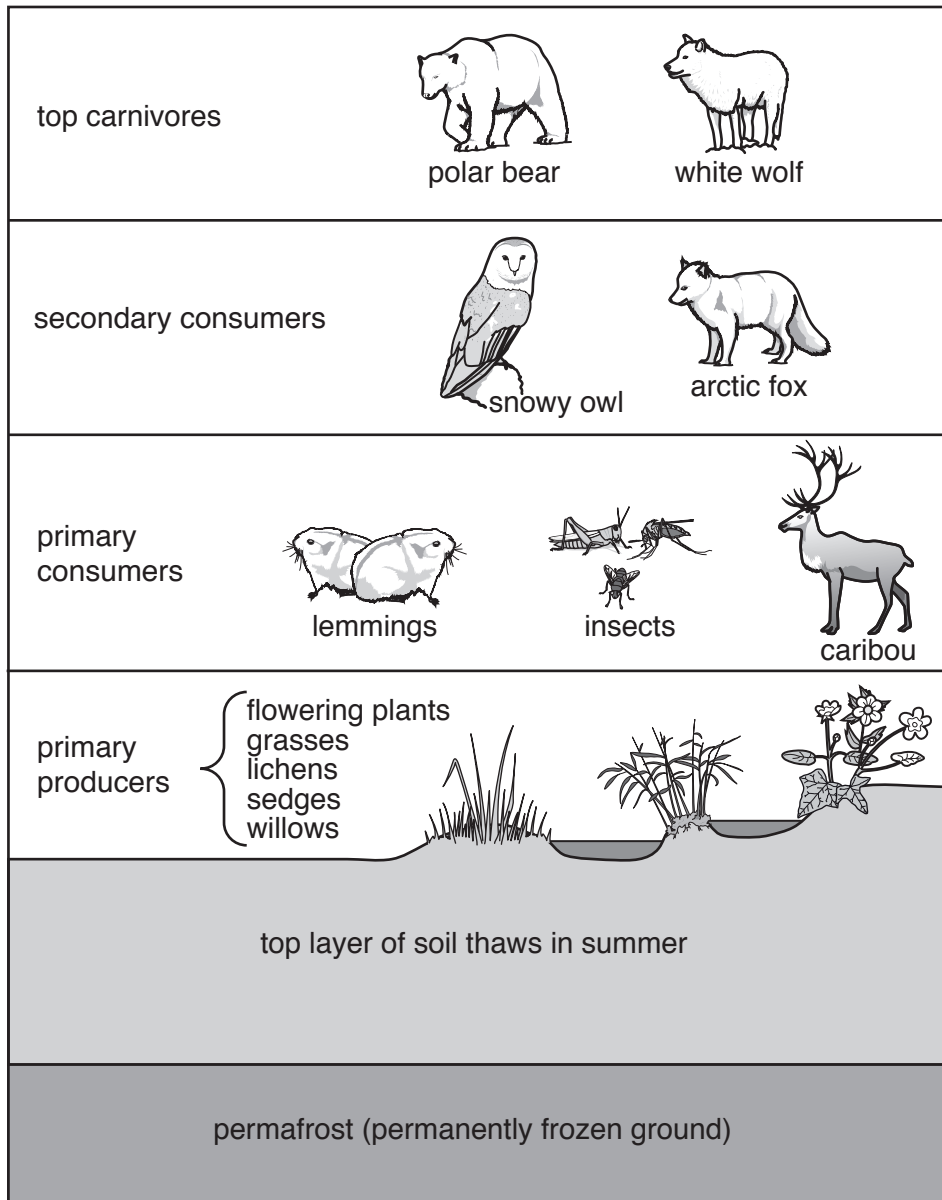
(i) State what is meant by the term *consumer*.

....

....[1]

(ii) Read the information in the text box.

> Some animals are moving further north into tundra regions as a result of global warming. One example is the red fox, which is a secondary consumer.

Suggest ways in which the tundra ecosystem could be affected by the movement of the red fox.

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....[4]

(d) In 1968 a large oil field was discovered in the Alaskan tundra.

(i) Explain how the oil was formed.

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....[3]

(ii) Look at the map below, which shows information about oil in Alaska. Use information from the map to complete the paragraph below.
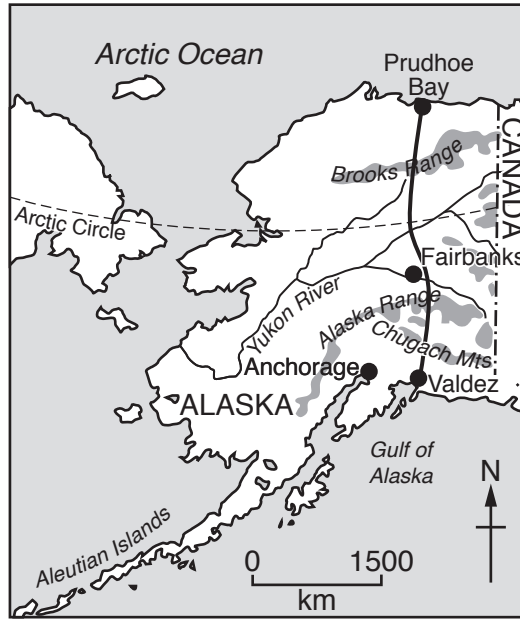
Key

● settlement

–·–·– international boundary

——— route of pipeline

▨ highland

river

In 1968 oil was discovered in northern Alaska. A pipeline was built to transport the oil.

The pipeline runs from .... in the north to .... on

the south coast of Alaska. Here the oil is taken away to markets by supertankers. The

pipeline crosses the .... River and passes close to the town of Fairbanks.

In total the pipeline is 1241 km long. [3]

(iii) Suggest why the pipeline was built rather than transporting the oil from the north of Alaska by sea in supertankers.

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....[1]

(e) Look at the photograph, which shows an oil pipeline in Alaska, and read the information.

vegetation grows very slowly

caribou breed close
to the pipeline

ground below surface
remains frozen all year

oil in the pipeline is warm

caribou migrate across the
region to search for food

animals, such as bears and
wolves, live in the region

pipelines can leak

(i) Suggest why there were concerns that building the pipeline could damage the environment.

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....[3]

(ii) In some places the pipeline was raised above the ground. Suggest **two** reasons why the pipeline was raised above the ground.

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....[2]

(f) Fossil fuels such as oil have provided much of the world's energy in the past.

Suggest reasons why some countries are developing alternative sources of energy but other countries are continuing to rely on fossil fuels.

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....[6]

2 (a) Look at the bar graph below, which shows world human population growth.

(i) The world human population in the year 2000 was 6000 million people.

Complete the bar graph for the year 2000. [1]

(ii) State the predicted world human population for the year 2025.

....[1]

(iii) Suggest reasons for the rapid growth of the world human population since the year 1800.

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....[5]

(b) Population growth is a cause of deforestation.

    (i) Look at the photograph, which shows an area of tropical rainforest that is being cleared.

Using the photograph and your own knowledge, explain why areas of tropical rainforest such as this are being cleared.

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(ii) Look at the table below, which shows the amount of tropical rainforest cleared in South America in four different years.

| year	amount of tropical rainforest cleared/km²
2003	25 247
2006	14 109
2009	7464
2012	4571

Calculate the difference between the amount of tropical rainforest cleared in 2003 and 2012.

Space for working.

.... km² [1]

(iii) Describe the trend in the amount of rainforest cleared in South America. Use data from the table to support your answer.

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....[2]

(iv) Suggest a reason to explain the trend identified in **(b)(iii)**.

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....[1]

(c) (i) Suggest how deforestation can increase global warming.

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....[3]

(ii) Look at the diagram.

tree canopy provides shade from the Sun

heavy daily rainfall intercepted by tree canopy

soil is protected from the heavy rainfall

decaying vegetation quickly becomes nutrients

shallow tree roots take up nutrients

Using the diagram and your own knowledge, explain how deforestation would affect the soil of the tropical rainforest.

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....[4]

(d) Deforestation results in the destruction of habitats. Suggest other ways in which human activity can result in the destruction of habitats.

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....[4]

(e) National parks are set up to protect habitats. Look at the table below, which shows the number of national parks in some countries in East Africa.

country	number of national parks
Ethiopia	13
Kenya	23
Malawi	9
Uganda	10

(i) Draw a bar graph on the grid below to show the information in the table. [4]

   (ii) Name the country with the highest number of national parks.

   .... [1]

   (iii) Suggest why some countries have more national parks than other countries.

   ....

   ....[1]

   (iv) Name **one** strategy, other than national parks, that can be used to conserve the biodiversity of an ecosystem.

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   ....[1]

(f) Describe the strategies that can be used to manage forests and their resources in a sustainable way.

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....[6]

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