Cambridge Assessment International Education

Cambridge International Advanced Subsidiary Level

ENVIRONMENTAL MANAGEMENT   **8291/12**

Paper 1 Lithosphere and Atmosphere   **October/November 2019**

1 hour 30 minutes

Additional Materials: Answer Booklet/Paper

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.

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

Section A
Answer **all** questions in this section.
Write your answers in the spaces provided on the question paper.

Section B
Answer **one** question from this section.
Write your answers on the separate answer paper provided.

At the end of the examination,
1.   fasten all separate answer paper securely to the question paper;
2.   enter the question number from Section B in the grid.
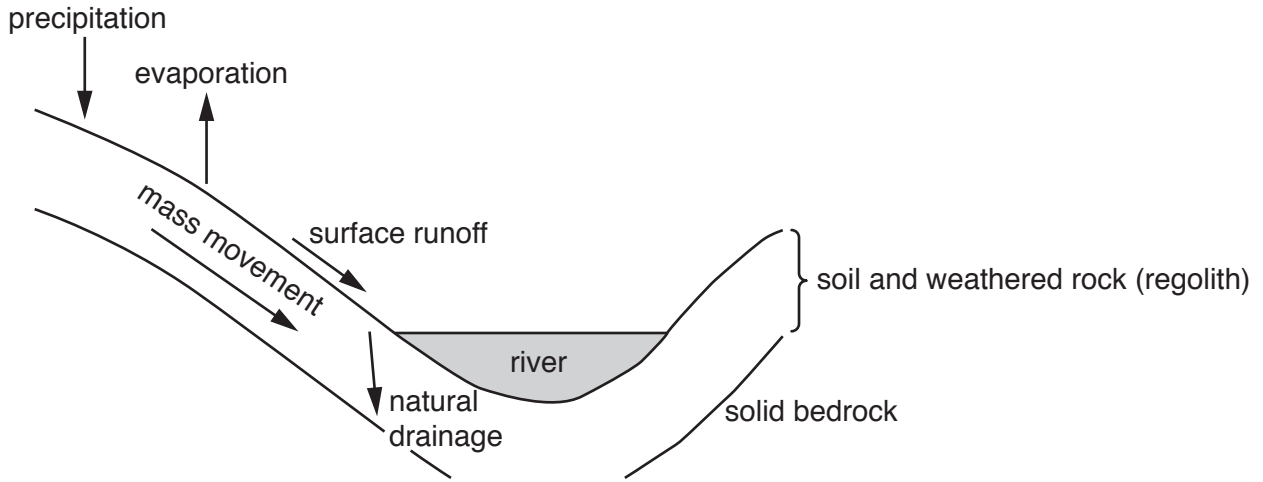
	For Examiner's Use
Section A	
1	
2	
Section B	
Total	

This document consists of **11** printed pages and **1** blank page.

Cambridge Assessment
International Education

[Turn over

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 (a) Fig. 1.1 shows the mass movement of a slope.

Fig. 1.1

(i) With reference to Fig. 1.1 describe the role of water in the mass movement shown.

....

....

....

....

....

....

....

.... [4]

(ii) Explain **two** methods which could be used to increase the stability of the slope shown in Fig. 1.1.

....

....

....

....

....

....

....

....

....

....

.... [6]

(b) (i) State **two** biotic factors which affect soil formation.

....

.... [2]

(ii) Explain how **one** climatic factor affects soil formation.

....

....

....

.... [2]

(c) Table 1.1 includes information about soils from three different regions of the world.

Table 1.1

	Soil **X**	Soil **Y**	Soil **Z**
O horizon thickness/cm	5	10	30
A horizon thickness/cm	50	30	800
B horizon thickness/cm	30	30	700
C horizon thickness/cm	20	20	500
organism activity	low	high	high
decay rate	slow	rapid	rapid
other observations	grey A horizon and iron pan between A and B horizon	difficult to distinguish between A and B horizon	iron deposited in lower layers

(i) With reference to Table 1.1, select the soil (**X**, **Y** or **Z**) which is most likely to be found in each of these regions:

moist temperate region   ....

moist tropical region.   ....   [2]

(ii) With reference to Table 1.1, explain your reasons for selecting the soil most likely to be found in the moist temperate region.

....

....

....

....

....

....

....

.... [4]

[Total: 20]

BLANK PAGE

 [Turn over

2   (a)   Fig. 2.1 shows climate graphs for two locations, **A** and **B**.
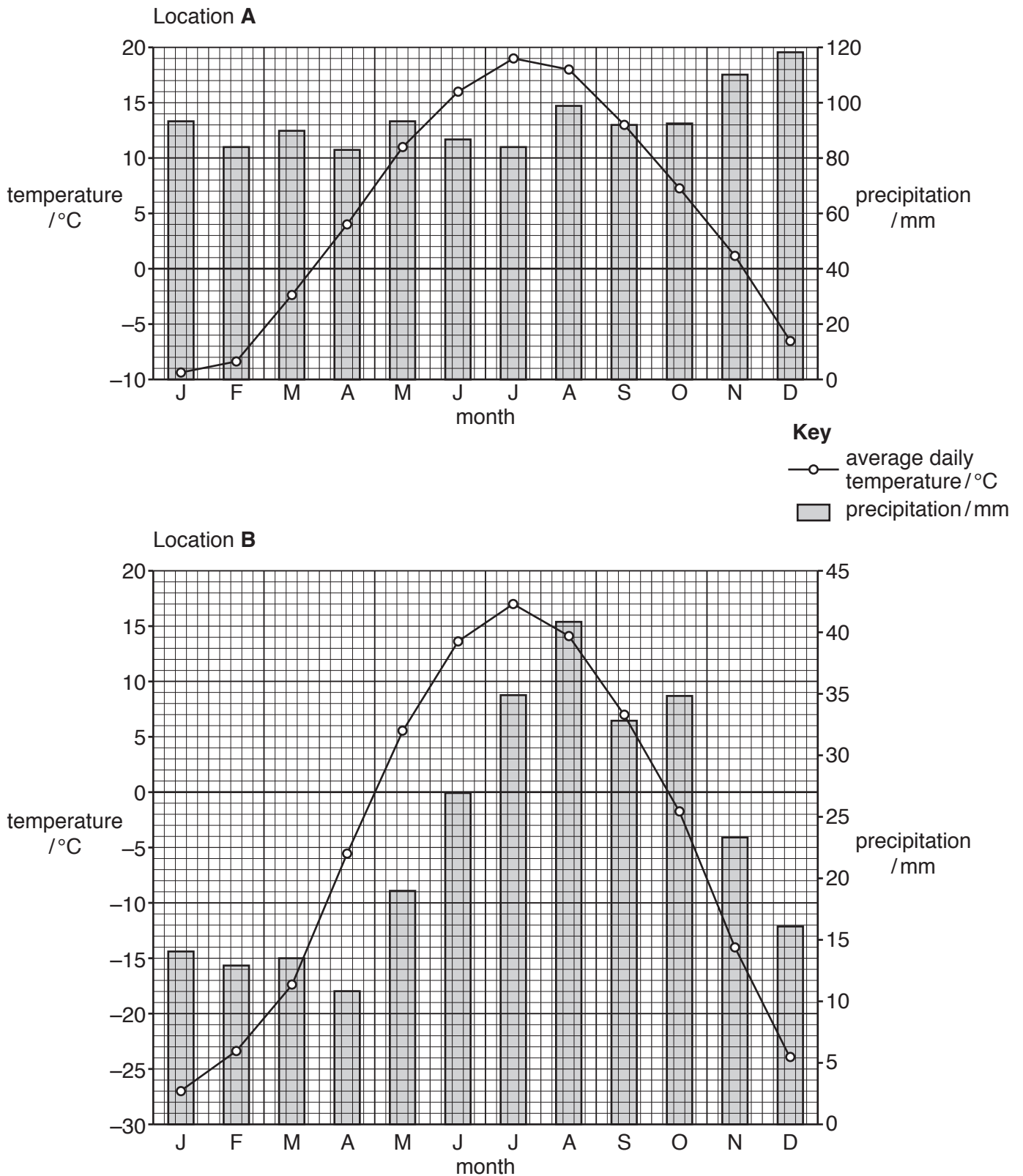
Fig. 2.1

(i) Using Fig. 2.1, calculate the annual range of temperature for Location **B**.

range of temperature = ...°C [2]

(ii) Describe the differences and similarities in the climate of Location **A** and Location **B** shown in Fig. 2.1.

....

....

....

....

....

....

....

.... [4]

(iii) Suggest reasons for the differences and similarities in the climate of Location **A** and Location **B** shown in Fig. 2.1.

....

....

....

....

....

....

....

.... [4]

(b) Fig. 2.2 shows two weather maps for a temperate location in the northern hemisphere.
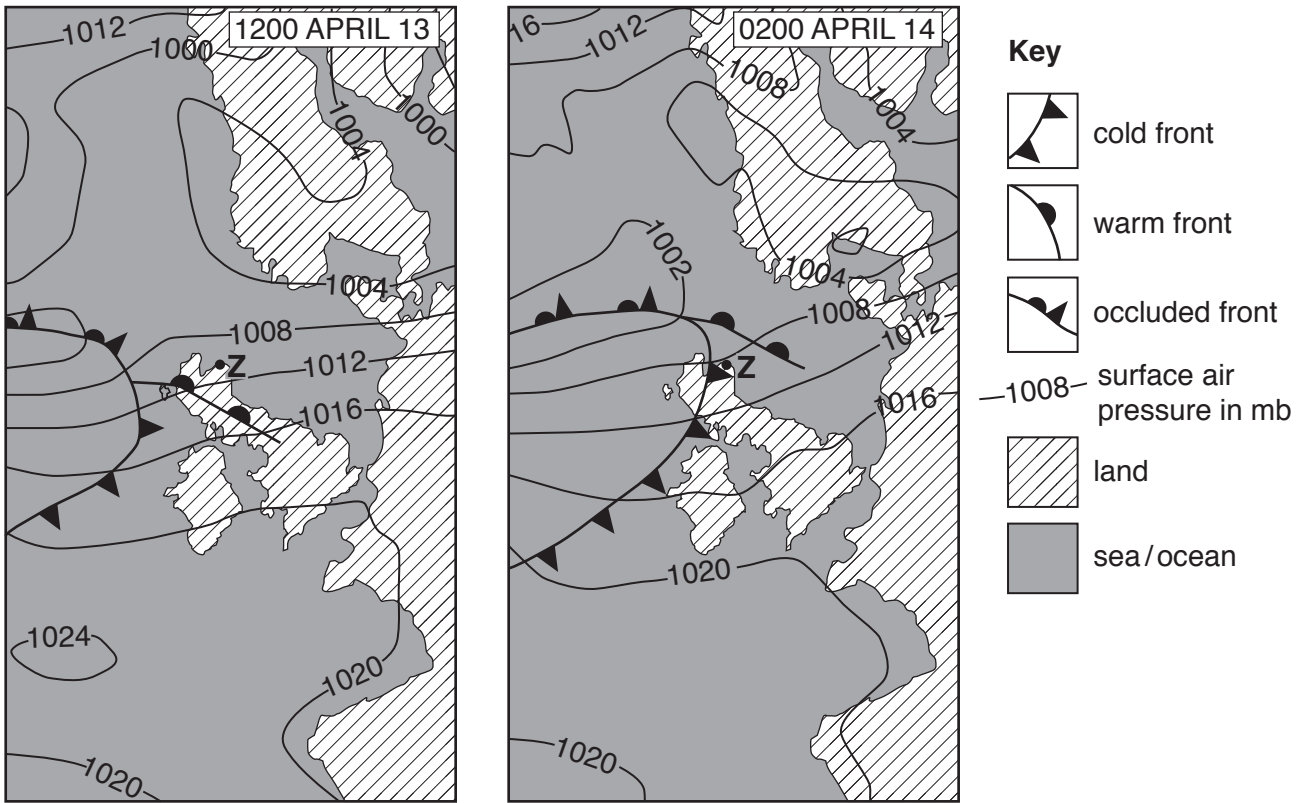
Fig. 2.2

(i) Using Fig. 2.2, estimate the air pressure at point **Z** at 1200 on April 13.

.... [1]

(ii) Name the type of weather system present in the area around point **Z** at 0200 on April 14 shown in Fig. 2.2.

.... [1]

(iii) Suggest the weather conditions experienced at point **Z** between 1200 on April 13 and 0200 on April 14.

....

....

....

....

....

....

....

.... [4]

(iv) Explain the benefits of weather forecasting for people living in areas affected by tropical cyclones.

....

....

....

....

....

....

....

.... [4]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers in the separate booklets provided.

3 Table 3.1 provides information about some of the major earthquakes which have occurred in the past 100 years.

Table 3.1

magnitude	country	year	deaths
6.3	New Zealand	2011	161
6.6	Iran	2003	26 271
6.8	Japan	1995	6 348
7.0	Haiti	2010	316 000
7.1	USA	1994	61
7.5	Guatemala	1976	22 084
7.6	China	1976	290 000
7.6	Turkey	1999	19 118
7.7	India	2001	19 727
7.8	China	1920	235 000
7.9	Japan	1923	142 800
7.9	Peru	1970	67 000
8.3	Mexico	1985	10 000
8.8	Chile	2010	432

(a) With reference to Table 3.1, suggest reasons why earthquakes with the greatest magnitude do not always cause the highest number of deaths. [10]

(b) 'The impact of hazards derived from plate movement depends on the level of economic development of the affected area.'

Using examples of volcanoes, discuss the extent to which you agree with this statement. [30]

[Total: 40]

4 Fig. 4.1 provides information about the current land use and possible effects of extracting natural gas by hydraulic fracturing (fracking) in an area of land in northern Canada.
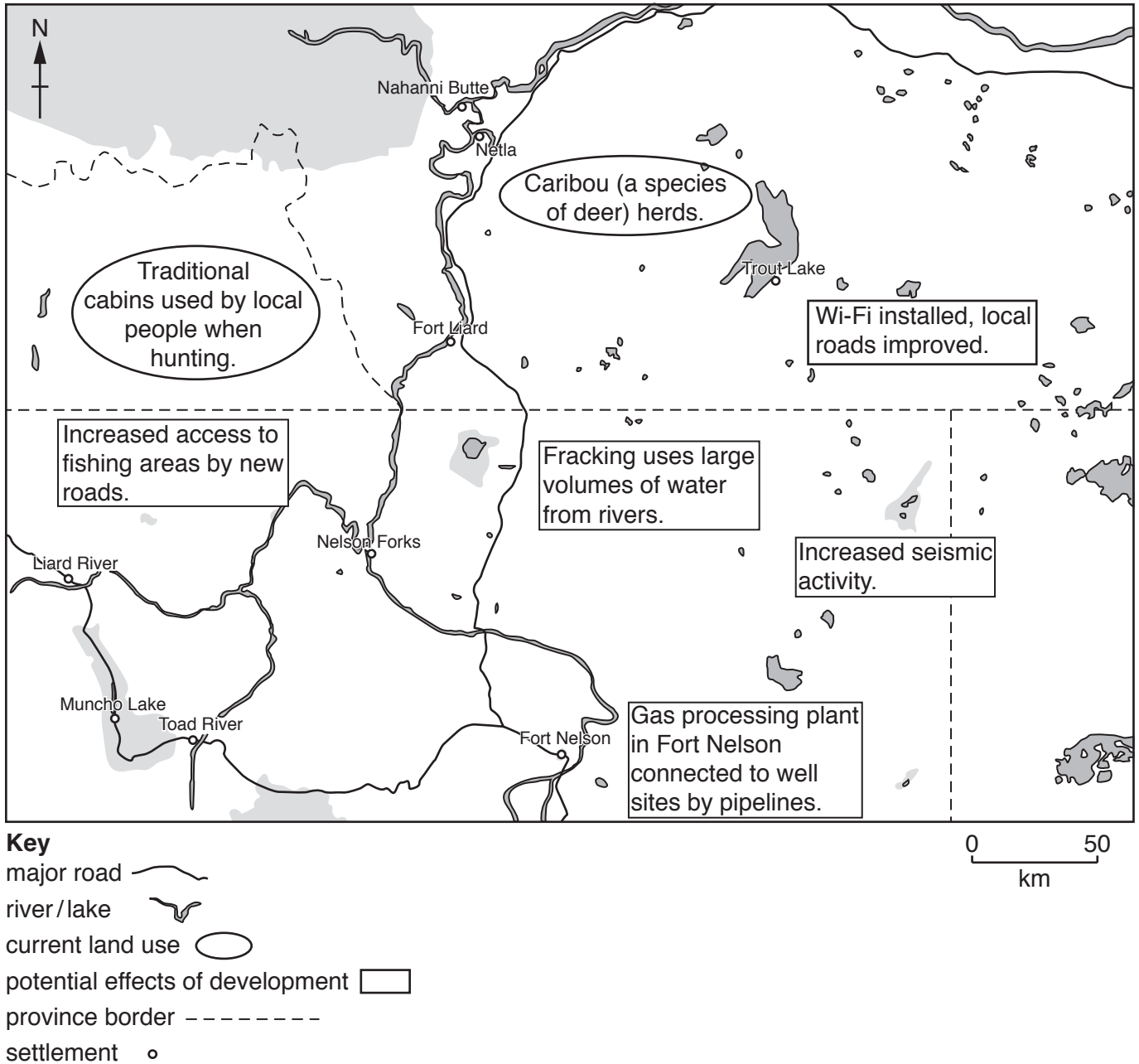
Fig. 4.1

(a) With reference to Fig. 4.1, describe and explain the potential impacts on the local population due to the development of land to provide a new source of energy. [10]

(b) 'A country's carbon dioxide emissions could be reduced to zero if governments effectively managed their energy resources.'

With reference to a range of energy resources, discuss the extent to which you agree with this statement. [30]

[Total: 40]

5 Fig. 5.1 provides information about air quality for the 10 cities with the largest populations in the year 2000.

The air quality was measured against World Health Organisation (WHO) guidelines.

city	population/ millions	air pollutant					
		sulfur dioxide	suspended particulate matter	lead	carbon monoxide	nitrogen dioxide	ozone
Mexico City	24.44	high	high	moderate	high	moderate	high
Sao Paulo	23.60	low	moderate	low	moderate	moderate	high
Tokyo	21.32	low	low	no data	low	low	high
New York	16.10	low	low	low	moderate	low	moderate
Calcutta	15.94	low	high	low	no data	low	no data
Bombay	15.43	low	high	low	low	low	no data
Shanghai	14.69	moderate	high	no data	no data	no data	no data
Jakarta	13.23	low	high	moderate	low	moderate	moderate
Buenos Aires	13.05	no data	moderate	low	no data	no data	no data
Rio de Janeiro	13.00	moderate	moderate	low	low	no data	no data

Key

■ high air pollution, greater than twice WHO guidelines.

▨ moderate air pollution, between one and two times WHO guidelines.

▢ low air pollution, WHO guidelines usually met.

☐ no data available or insufficient data for assessment.

Fig. 5.1

(a) With reference to Fig. 5.1 describe the relationship between the population of a city and its air quality. [10]

(b) 'Atmospheric pollution is the result of development.'

To what extent do you agree with this statement? Include examples of countries at different stages of economic development. [30]

[Total: 40]