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ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **October/November 2025**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

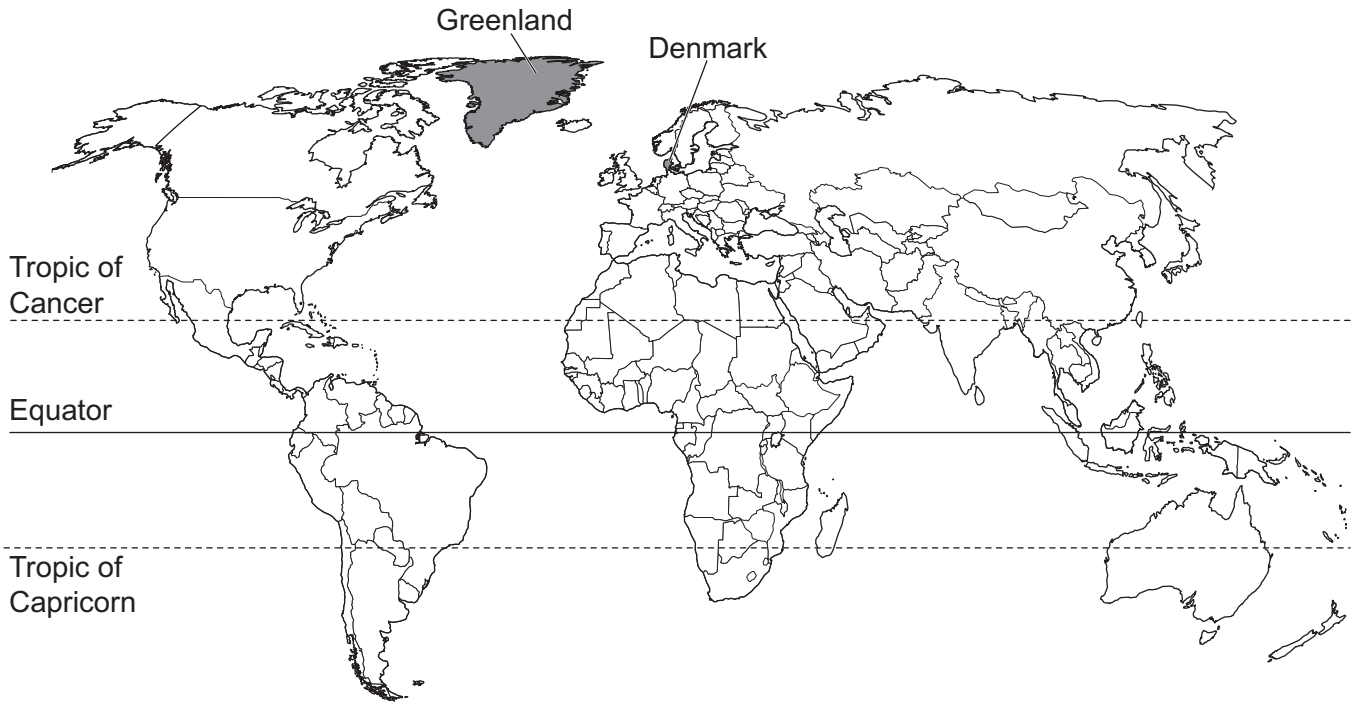
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

world map showing the location of Denmark and Greenland

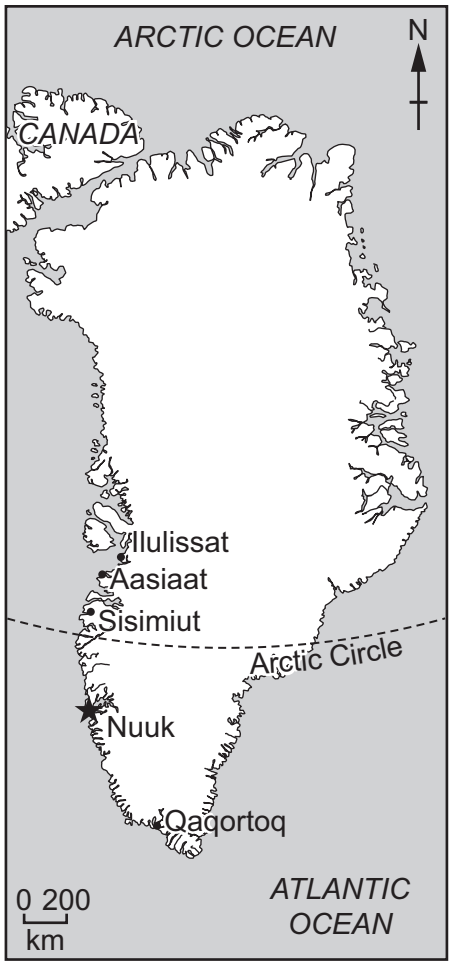


map of Greenland

Key

★ capital city

● settlement



Area of Greenland: 2 166 086 km^2

Population: 57 792 (in 2022)

Children per woman: 1.91

Life expectancy: 74 years

Currency: Danish krone (1 USD = 0.15 DKK)

Language: Greenlandic, Danish, English

Climate of Greenland: long cold winters; short cool summers

Terrain of Greenland: ice sheets and glaciers cover 80% of the land; narrow mountainous rocky land along the coast

Main economic activities of Greenland: fishing and fish processing provide over 90% of exports

Greenland is part of Denmark. Denmark is a more economically developed country (MEDC) in Europe.

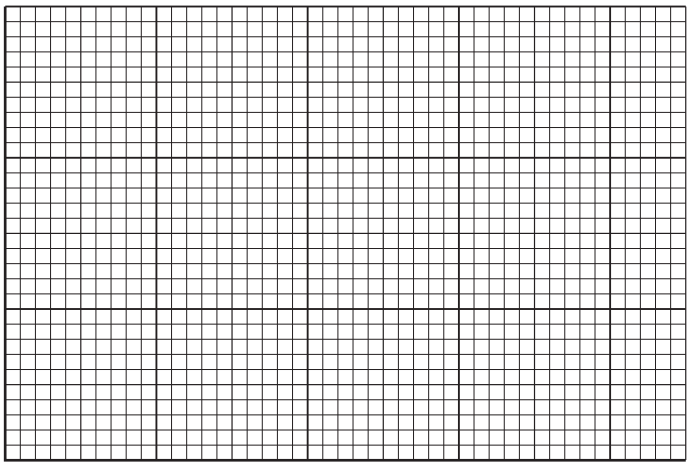
Greenland is the largest island in the world. The coastline has many ports and harbours. Most of these are closed by ice during the winter months. In 2021, the government banned the extraction of mineral resources. These resources included minerals used in the manufacture of batteries for electric cars and computer chips. Hydro-electric power is used to supply electricity to the largest settlements. Income from tourism is increasing.

1 **(a)** The table shows the population of Greenland from 1950 to 2020.

The population is rounded to the nearest 1000.

year	population
1950	23 000
1960	32 000
1970	45 000
1980	50 000
1990	56 000
2000	56 000
2010	56 000
2020	56 000

(i) Plot the data in the table as a line graph.



[4]

(ii) Describe the trend shown by the data in the table.

.....

..... [1]

(b) Many people between the ages of 18 and 30 move from Greenland to Denmark.

(i) State the term used to describe the movement of people from one place to another.

..... [1]

(ii) A report states that the climate, the economy and education are causes of the movement of people from Greenland.

Suggest **one** reason for each cause.

Greenland's climate .....

.....

Greenland's economy .....

.....

Greenland's education .....

.....

[3]

(c) The population of the largest settlements in Greenland in 2022 is shown in the table.

settlement	population
Aasiaat	3005
Ilulissat	4413
Nuuk	14 798
Qaqortoq	3224
Sisimiut	5227

(i) Rank the settlements by population from highest to lowest.

	settlement
highest ↓	
lowest	

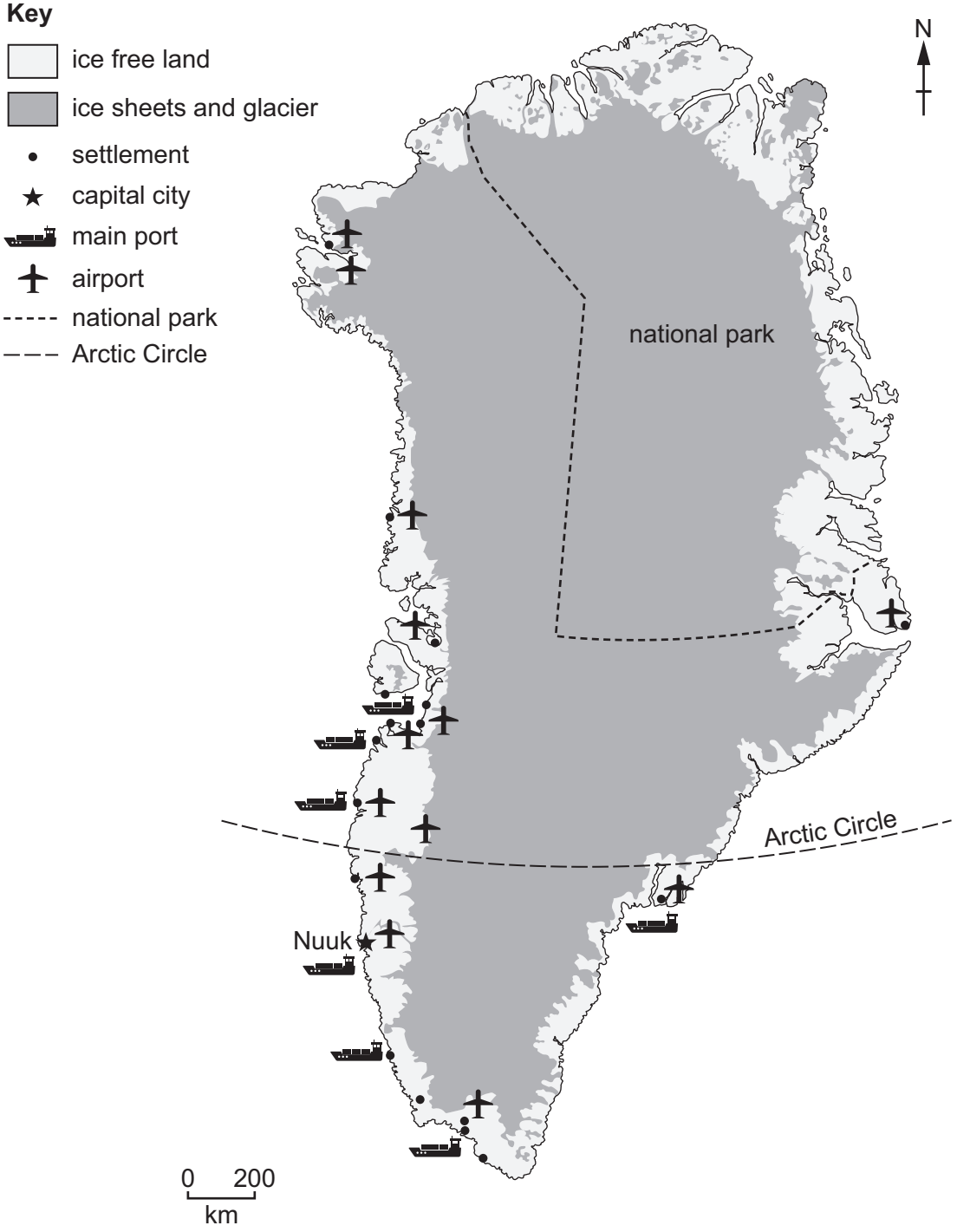
[1]

(ii) The population of Greenland in 2022 is 57 792.

Calculate the percentage of the population of Greenland living in Nuuk.

.....% [1]

(d) The map shows the settlements where most people live in Greenland.



(i) Describe the distribution of the settlements shown on the map.

.....

.....

.....

.....

.....

..... [3]

(ii) There are no roads between the settlements.

Suggest **two** ways people travel between settlements in Greenland.

1 .....

2 .....

[2]

(iii) Estimate the percentage of Greenland occupied by the national park.

Circle **one** percentage.

15% **30%** **45%** **65%**

[1]

(e) The table shows climate data for weather stations in the north and south of Greenland.

The data shows mean values.

north				
month	**maximum temperature / °C**	**minimum temperature / °C**	**precipitation / mm**	**hours of daylight**
Jan	–19.0	–27.0	6.0	0.0
Feb	–20.6	–28.4	6.0	2.9
Mar	–20.1	–27.8	4.0	11.6
Apr	–12.8	–21.0	6.0	20.4
May	–2.6	–8.6	7.0	24.0
Jun	4.2	–0.7	7.0	24.0
Jul	7.4	2.1	16.0	24.0
Aug	6.2	1.6	24.0	22.8
Sep	0.6	–4.0	18.0	14.2
Oct	–6.7	–12.8	12.0	6.0
Nov	–12.9	–20.1	10.0	0.0
Dec	–17.8	–25.0	8.0	0.0
south				
month	**maximum temperature / °C**	**minimum temperature / °C**	**precipitation / mm**	**hours of daylight**
Jan	–2.2	–9.2	57	6.7
Feb	–1.7	–8.8	51	9.1
Mar	–1.0	–8.4	57	11.9
Apr	2.8	–4.4	56	14.7
May	6.9	–0.4	56	17.4
Jun	9.2	1.3	75	19.0
Jul	11.1	3.3	97	18.1
Aug	11.0	3.7	93	15.6
Sep	8.0	1.9	92	12.8
Oct	3.9	–1.7	72	10.0
Nov	–0.8	–5.0	78	7.4
Dec	–1.4	–7.8	73	5.8

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

	north	south
temperature range / °C	35.8	.....
total annual precipitation / mm	.....	857

[2]

(ii) Summer in Greenland has long days and lasts three months.

State the **three** summer months in Greenland.

..... and ..... and ..... [1]

(iii) Explain why people living in the north of Greenland use large amounts of electricity during the winter months.

.....

.....

.....

..... [2]

(iv) The climate of Greenland limits crop production.

Some farmers grow crops in greenhouses.

Explain how greenhouses increase crop production.

.....

.....

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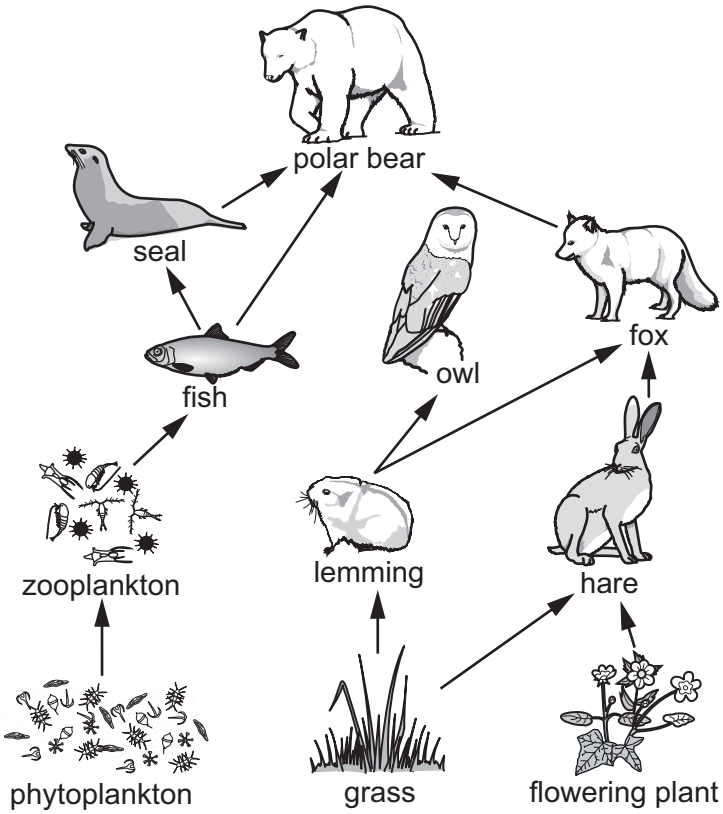
.....

.....

..... [3]

(f) The diagram shows a food web in the north of Greenland.



(i) State what the arrows in the food web show.

.....

..... [1]

(ii) Use the food web to write a food chain that includes **five** trophic levels.

..... [2]

(iii) The grass and flowering plant in the food web contain a green pigment that captures light energy.

Name this green pigment.

..... [1]

(iv) State the word equation for photosynthesis.

..... [2]

(v) Some flowering plants are pollinated by insects.

Complete the sentences to describe the process of pollination.

Pollination is the movement of ..... from the ..... to the

..... of a flower.

[3]

(g) (i) A student investigates the number of different species of flowering plants in the north of Greenland.

Statements **A**–**F** describe the method the student uses.

The statements are **not** in the correct order.

A mark 10 sampling sites at regular intervals along the transect line

B make a 10 m transect line with a measuring tape

C count the number of flowering plants in each quadrat

D record the results in a table

E use a book to identify the different species

F place a 1 m × 1 m quadrat at each of the 10 sampling sites

Write the letters of statements **A**–**F** in the correct order.

The last one has been completed.

1	2	3	4	5	6 **D**

[3]

(ii) Name the sampling method used by the student.

..... [1]

(iii) The student records a total of 4 flowering plants of one species in the 10 quadrats.

Each quadrat is 1 m^2.

Estimate the number of flowering plants of this species in 1 km^2 (1 000 000 m^2).

..... [1]

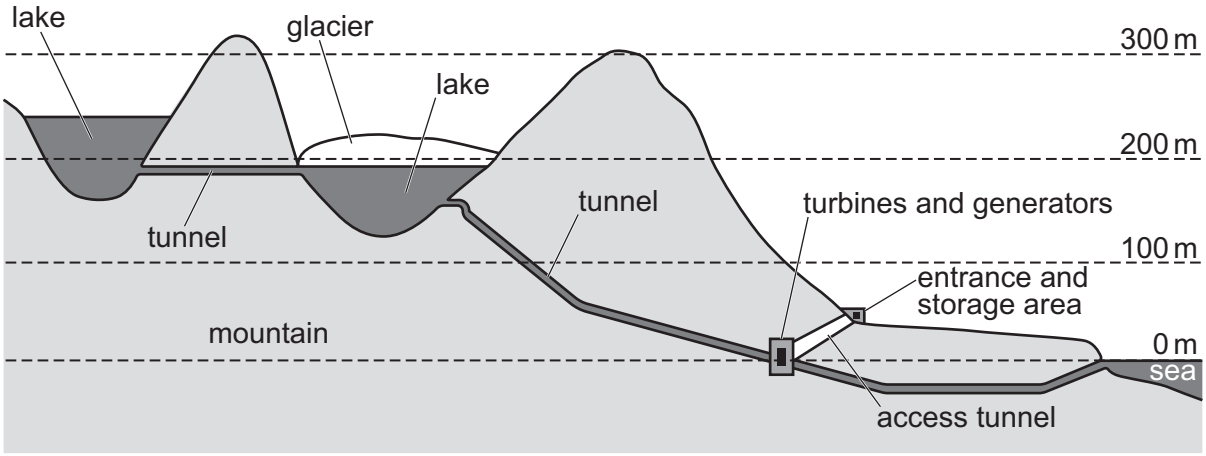
[Total: 39]

2 **(a)** Greenland has 5 hydro-electric power (HEP) stations. They supply electricity to the largest settlements.

The diagram shows an HEP station 45 km north of Ilulissat.

Key

---- height above sea level in m



(i) Use the diagram to describe how water from the lakes is used to generate electricity.

.....

.....

.....

.....

.....

..... [3]

(ii) The turbines and generators are inside the mountain below a layer of permafrost.

Describe permafrost.

.....

..... [1]

(iii) The power station is designed to be automated to generate electricity without the need for people to operate the machinery.

Suggest **three** reasons for this design.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(iv) The HEP station replaced a fossil fuel powered station in Ilulissat.

Suggest **three** reasons why people in Ilulissat were in favour of the HEP station.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(v) State **three** ways people can use energy efficiently in their homes.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) It is expensive to build solar panels and wind turbines.

Many small settlements in Greenland have some of their electricity generated by solar panels and wind turbines.

State **three** limitations of relying on solar energy for electricity generation.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(c) Suggest reasons why the government of Greenland is building wind turbines.

.....

.....

.....

.....

.....

..... [3]

(d) It is expensive to build a geothermal power station.

Suggest **one** other reason why Greenland does **not** have any geothermal power stations.

.....

..... [1]

(e) Fossil fuels are non-renewable energy resources.

Name **one** other non-renewable energy resource.

..... [1]

[Total: 21]

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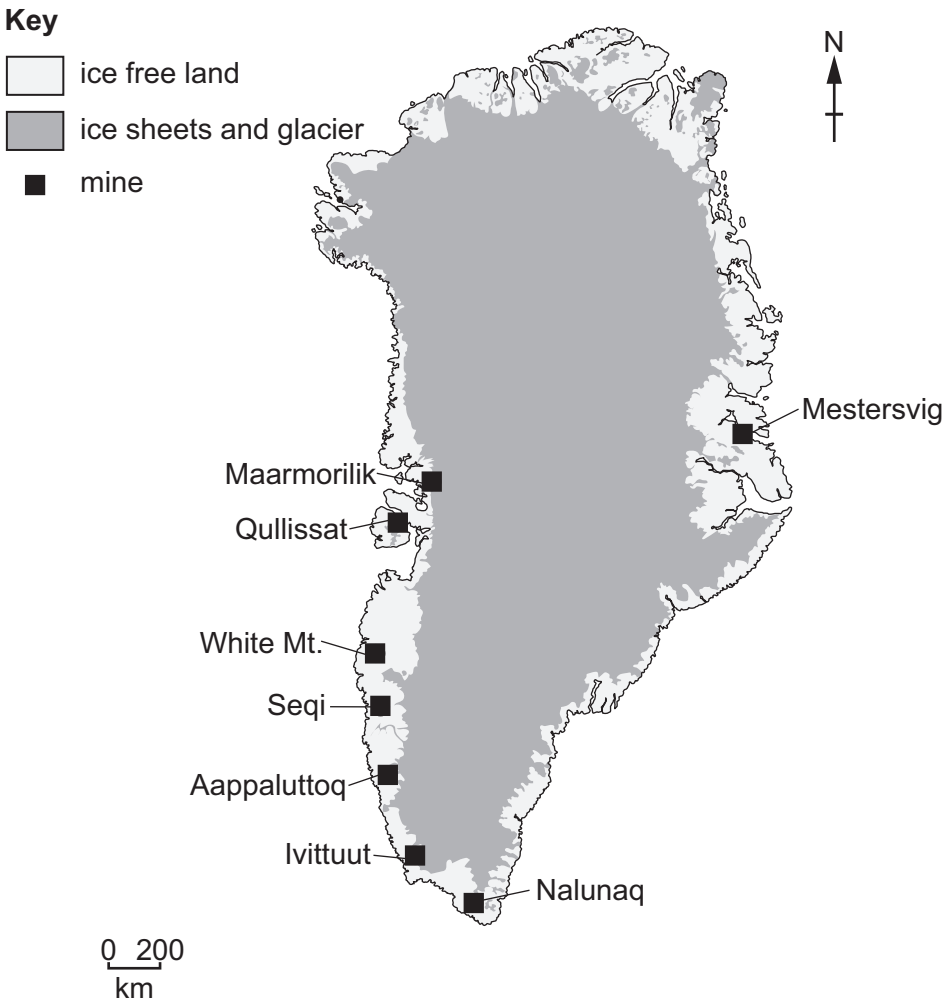
3 **(a)** The map shows the location of eight mines in Greenland.



The table shows information about the eight mines.

mine	material extracted	years of operating	environmental impact assessment	pollution risk
Ivittuut	cryolite	1854–1987	no	marine
Qullissat	coal	1924–1972	no	none identified
Mestersvig	lead, zinc	1956–1963	no	marine and land
Maarmorilik	lead, zinc, silver	1973–1990	no	marine
Nalunaq	gold	2004–2013	yes	none identified
Seqi	olivine	2005–2009	yes	dust
Aappaluttoq	rubies	2017–present	yes	none
White Mt.	anorthosite	2018–present	yes	none

(i) Suggest **one** reason why the mines on the map are located close to the coast.

.....

..... [1]

(ii) Name the **two** mines operating in 2022 and the material extracted.

mine ..... material .....

mine ..... material .....

[1]

(iii) Tick (✓) the boxes that describe part of an environmental impact assessment (EIA).

availability of local workforce	☐
checking for endangered species	☐
fracking	☐
measuring the weather	☐
surveying wildlife	☐
waste disposal	☐

[3]

(b) A company uses a questionnaire to find people's views about opening a new mine in Greenland.

The company sends the questionnaire to 50 men living in Denmark.

Suggest **two** limitations of this sampling method.

1 .....

.....

2 .....

.....

[2]

(c) Anorthosite is an igneous rock mined in Greenland.

Describe the formation of igneous rock.

.....

.....

.....

.....

.....

..... [3]

(d) State **three** strategies for the sustainable use of rocks and minerals.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....

[3]

(e) Scientists have found large amounts of mercury in the water along the coasts and in the rivers in Greenland.

Mercury is a toxic substance.

Suggest **two** reasons why people in Greenland are concerned about mercury in the water.

1 .....

.....

2 .....

.....

[2]

[Total: 15]

4 A report states that the largest ice sheet in Greenland is getting smaller.

(a) State **two** negative environmental impacts of melting ice sheets.

1 .....

.....

2 .....

.....

[2]

(b) Suggest **three** ways the melting of ice sheets and glaciers may benefit the economy of Greenland.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

[Total: 5]

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