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6202262862

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **February/March 2024**

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.

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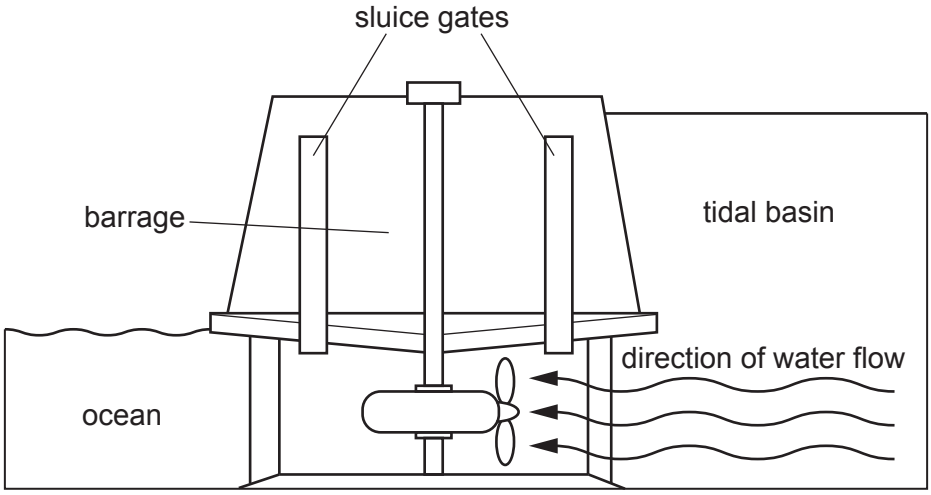
Section A

1 **(a)** The list contains examples of energy resources.

nuclear **geothermal** **coal** **oil** **biogas**

Draw a circle around **two** renewable energy resources. [2]

(b) The diagram shows how ocean tides are used to generate electricity.



A barrage is a dam-like structure. The tidal basin stores tidal sea water. The sluice gates slide up inside the barrage and down into the ocean.

(i) Describe how ocean tides are used to generate electricity.

Use the diagram to support your answer.

.....

.....

.....

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.....

..... [3]

(ii) The barrage in the diagram has sluice gates.

Suggest the function of the sluice gates.

.....

..... [1]

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(c) Describe **one** benefit and **one** limitation of using ocean tides to generate electricity.

benefit .....

.....

limitation .....

.....

[2]

[Total: 8]

2 **(a)** Use words from the list to complete the sentences describing soils as a medium for plant growth.

carbon dioxide **nitrate** **phosphate** **potassium** **water**

Each word may be used once, more than once or not at all.

Soils provide plants with nitrogen as ..... ions and phosphorus as

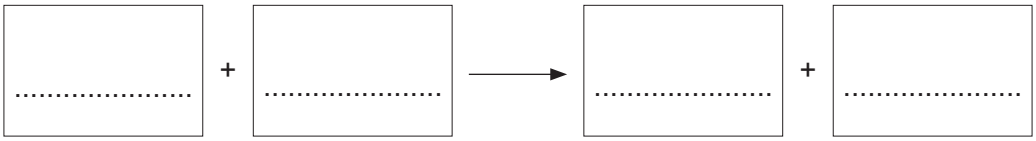
..... ions. The organic content of the soil is important because it helps the

soil to retain ..... .

[3]

(b) Plants photosynthesise to provide substances and energy needed for growth.

(i) State the word equation for photosynthesis.



[2]

(ii) State the substance found in some plant cells that absorbs light energy during photosynthesis.

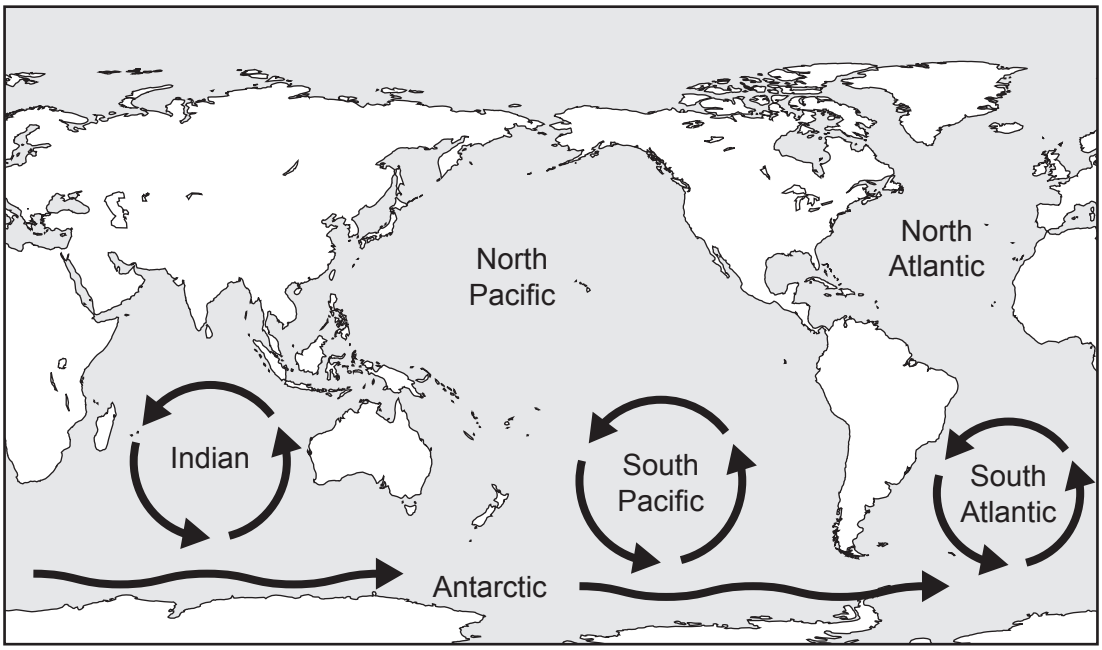
..... [1]

[Total: 6]

3 The map shows the distribution of some major ocean currents.

Key

major ocean current



(a) **(i)** Label with an **X** a cold ocean current in the Indian Ocean. [1]

(ii) Draw on the map the major ocean currents in the North Pacific. [1]

(b) Many marine fisheries are found where ocean currents meet or are found on continental shelves.

Explain how ocean currents and continental shelves affect the distribution of marine fisheries.

ocean currents .....

.....

.....

.....

continental shelves .....

.....

.....

.....

[4]

[Total: 6]

Section B

4 The photograph shows the Tungurahua volcano in Ecuador.



(a) The Tungurahua volcano is on a plate boundary.

Suggest the type of plate boundary that the Tungurahua volcano is found on.

..... [1]

(b) **(i)** The Tungurahua volcano is very active. It has erupted several times in the past 20 years. In 2000, a group of volunteers from local communities started to monitor the volcano.

Suggest the benefits and limitations of this strategy for managing the impacts of a future eruption.

benefits .....

.....

.....

.....

limitations .....

.....

.....

.....

[3]

(ii) There is a small town near the volcano.

Explain **two** reasons why people choose to live close to a volcano.

1 .....

.....

.....

2 .....

.....

.....

[4]

(c) (i) During an eruption in 2006, the Tungurahua volcano emitted 12 000 tonnes of sulfur dioxide gas that reached a height of 8 km in the atmosphere.

State the layer of the atmosphere that contains this sulfur dioxide gas.

..... [1]

(ii) Sulfur dioxide gas is an atmospheric pollutant.

Explain how sulfur dioxide gas causes the acidification of lakes.

.....

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..... [3]

[Total: 12]

5 **(a)** The photograph shows maize growing on a subsistence farm in Africa.



(i) Identify **one** feature from the photograph that shows this is subsistence agriculture.

.....

..... [1]

(ii) Adding fertilisers is one technique used to increase the yield of maize.

Identify **two** other techniques that this farmer is using to increase the yield of maize.

Only identify techniques shown in the photograph.

1 .....

.....

2 .....

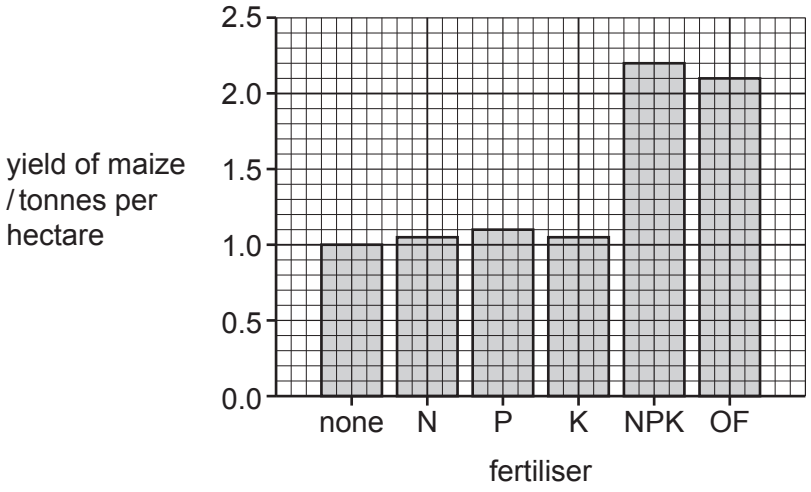
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[2]

(b) The bar chart shows the effect on the yield of maize of adding different fertilisers to different fields.

Key

none = no fertiliser added
N = nitrogen-based fertiliser
P = phosphorus-based fertiliser
K = potassium-based fertiliser
NPK = nitrogen, phosphorus and potassium fertiliser
OF = organic fertiliser



(i) One conclusion from the data is that adding fertiliser made from a mixture of nitrogen, phosphorus and potassium gives the highest yield of maize per hectare.

State **one** other conclusion from the data.

.....

..... [1]

(ii) Explain why fertiliser was **not** added to one of the fields of maize.

.....

..... [1]

(iii) State **two** types of organic fertiliser.

1 .....

2 .....

[2]

(c) Describe how the overuse of fertilisers can lead to the death of aquatic organisms.

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..... [4]

[Total: 11]

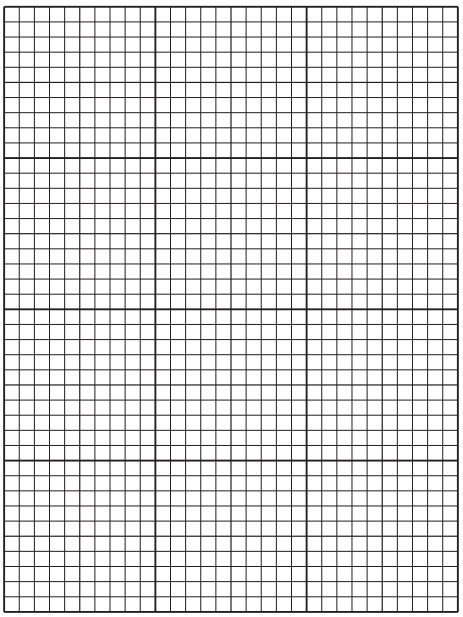
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6 Chlorofluorocarbons (CFCs) are known as ozone-depleting substances because they destroy ozone in the atmosphere. The table shows the emissions of ozone-depleting substances from 1980 to 2015.

year	emissions of ozone-depleting substances / million tonnes
1980	1.1
1990	1.3
2000	0.5
2010	0.4
2015	0.3

(a) Plot a line graph to show the emissions of ozone-depleting substances between 1980 and 2015.

Draw a straight line between each plotted point.



[5]

(b) Explain how CFCs destroy ozone.

.....

.....

.....

.....

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..... [3]

(c) Describe the benefits and limitations of strategies to reduce the impact of CFCs.

benefits .....

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.....

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limitations .....

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[5]

[Total: 13]

7 The table shows the distribution of fresh water on Earth.

source	volume of fresh water / cubic kilometres
ice sheets and glaciers	24 500 000
ground water	10 500 000
lakes and rivers	125 000
atmosphere	
total	35 140 000

(a) (i) Calculate the volume of fresh water found in the atmosphere. Include the unit.

volume = ... unit = ... [2]

(ii) Calculate the ratio for the volume of water in lakes and rivers compared to the volume of water in ice sheets and glaciers.

Give your answer as the simplest whole number ratio.

ratio = ... : ..... [2]

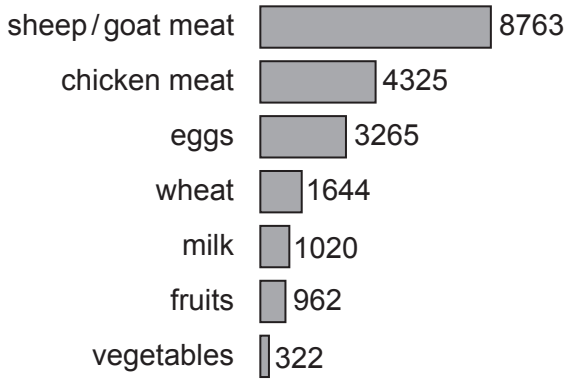
(iii) Ice sheets and glaciers contain stored frozen water.

State **one** other natural form of stored frozen water on Earth.

..... [1]

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(b) The diagram shows the volume of water in litres needed to produce 1 kg of different foods.



Describe how people can change their diets to reduce the volume of water used in food production.

Use data from the diagram to support your answer.

.....

.....

.....

..... [2]

(c) In many areas, safe drinking water is unavailable. This means that water-related diseases are more common.

Leptospirosis is a water-related disease that causes liver and kidney failure. Like cholera, leptospirosis is a bacterial disease.

Suggest how people can avoid catching leptospirosis.

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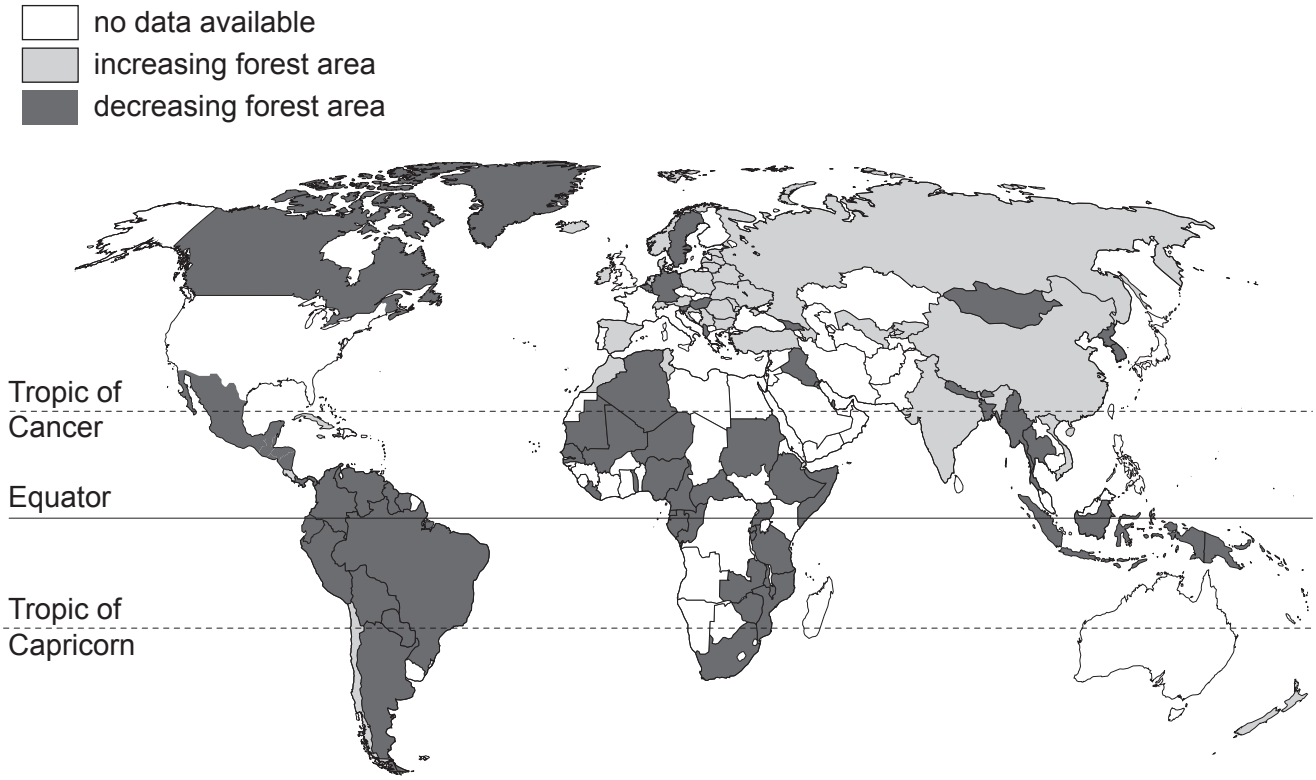
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..... [3]

[Total: 10]

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8 The map shows the annual change in forest area for countries between 2010 and 2015.



(a) Describe the distribution of countries with increasing forest area.

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..... [2]

(b) A country can increase its forest area by reforestation or afforestation strategies.

Compare these **two** strategies.

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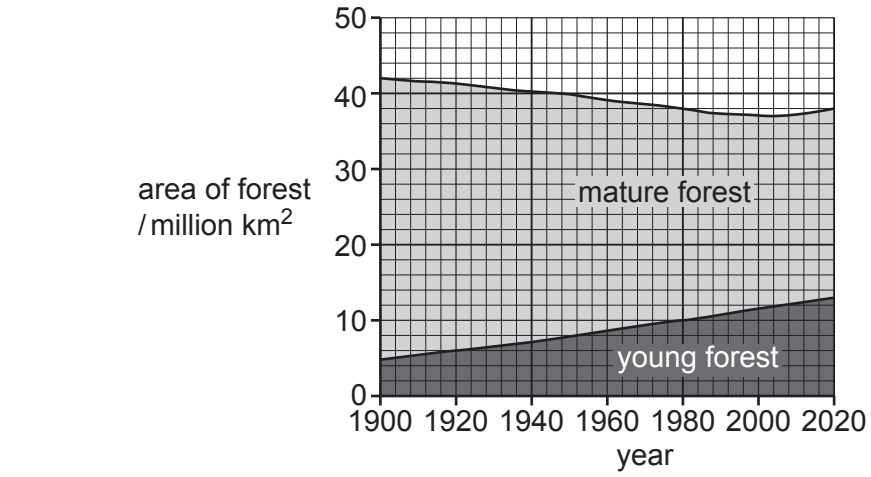
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..... [2]

(c) Young forests act as carbon sinks and mature forests act as carbon stores.

The graph shows the area of the world's forests by age from 1900 to 2020.



(i) Describe the trends shown by the data.

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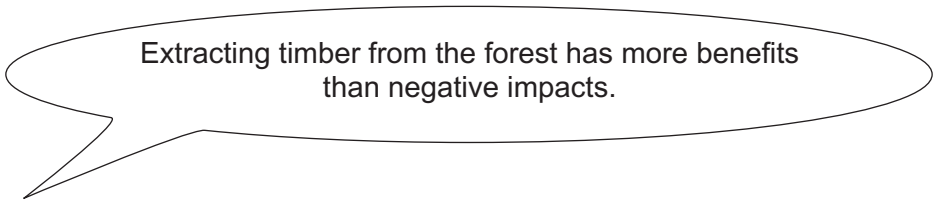
..... [2]

(ii) Calculate the percentage of the world's forests that were mature in 2020.

.....% [2]

(d) A landowner wants to extract timber from 10 000 ha of forest.

The landowner says:



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

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..... [6]

[Total: 14]

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