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Cambridge O Level

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ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 Theory **May/June 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.

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Section A

1 **(a)** Earthquakes are one cause of a tsunami.

State what is meant by a tsunami.

.....

..... [1]

(b) State **two** ways that an early warning about an earthquake saves lives.

1 .....

.....

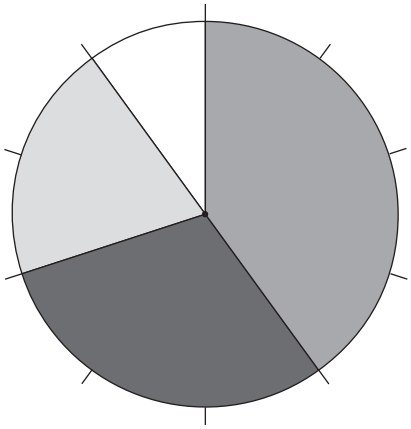
2 .....

.....
[2]

(c) Some scientists used a computer model to predict whether an earthquake would occur.

The scientists used data from 120 tectonic events to test the computer model.

The pie chart shows the results.



Key

- correctly predicted no earthquake
- correctly predicted an earthquake would occur
- incorrectly predicted an earthquake would occur
- incorrectly predicted no earthquake

Calculate the number of correct predictions.

..... [2]

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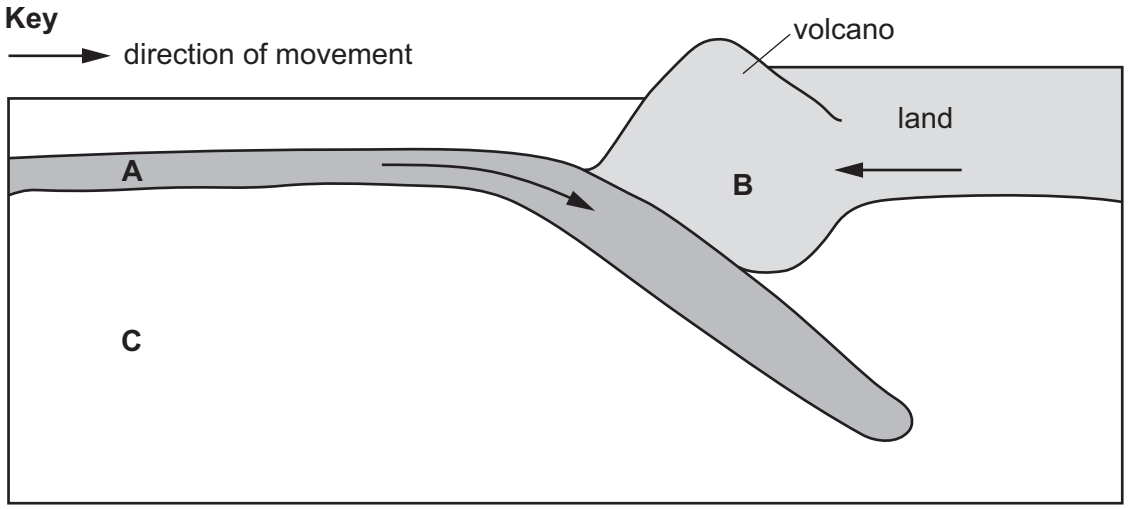
(d) The diagram shows a section of the Earth.



(i) Name parts **A**, **B** and **C**.

A .....

B .....

C .....

[3]

(ii) Label the subduction zone with the letter **S** on the diagram. [1]

[Total: 9]

DO NOT WRITE IN THIS MARGIN

2 Complete the sentences about the El Niño Southern Oscillation phenomenon.

Use words from the list. Each word may be used once, more than once or not at all.

Atlantic **cold** **decrease** **east** **increase**

north **Pacific** **polluted** **south**

Southern **warm** **west**

The usual wind direction reverses above the ..... Ocean.

The warm water around Oceania moves ..... .

This causes the sea level along the coast of South America to ..... .

There is more ..... water and more rainfall than normal around the coast of South America.

Marine fisheries in South America ..... .

[5]

DO NOT WRITE IN THIS MARGIN

3 **(a)** The oceans are a source of food.

(i) Describe what is meant by bycatch.

.....

..... [1]

(ii) State **one** reason why closed seasons are used to manage marine species.

.....

..... [1]

(iii) Explain why international agreements are needed to manage the harvesting of marine species.

.....

..... [1]

(iv) State **one** strategy used to manage the harvesting of marine species other than closed seasons and international agreements.

..... [1]

(b) State **two** ways the oceans are a source of energy.

1 .....

.....

2 .....

.....
[2]

[Total: 6]

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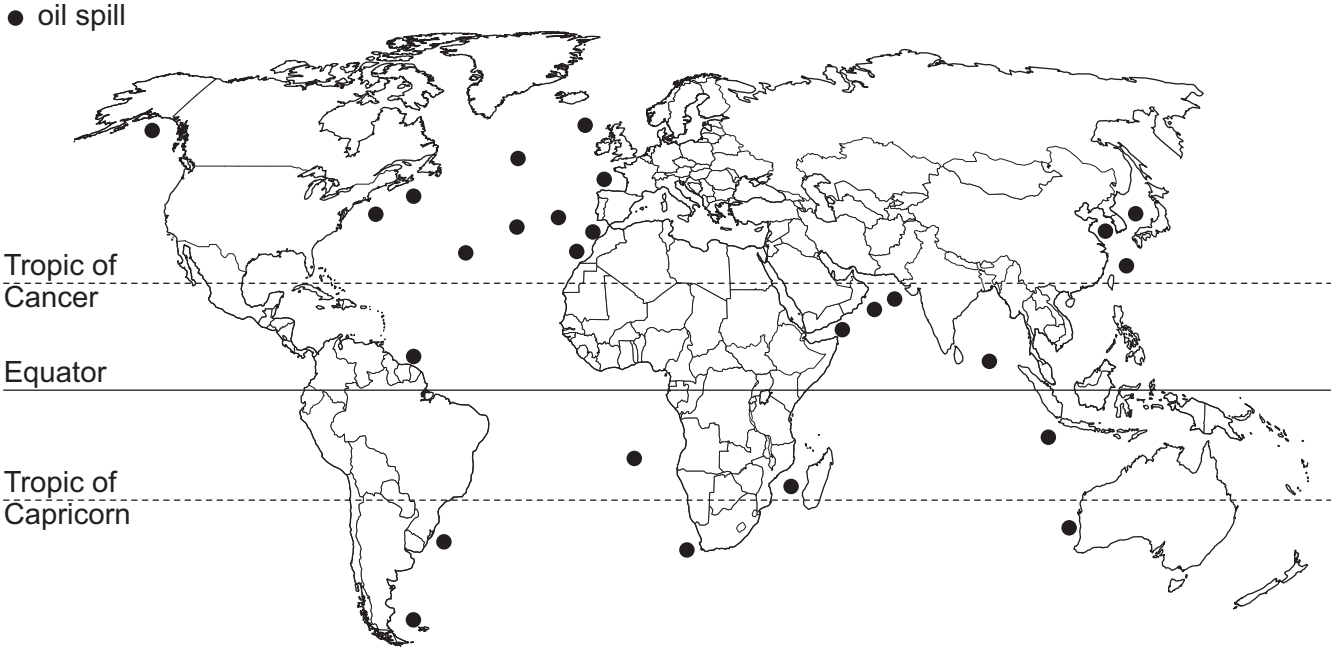
Section B

4 **(a)** The map shows some oil spills.

Key

● oil spill



Describe the distribution of oil spills shown on the map.

.....

.....

.....

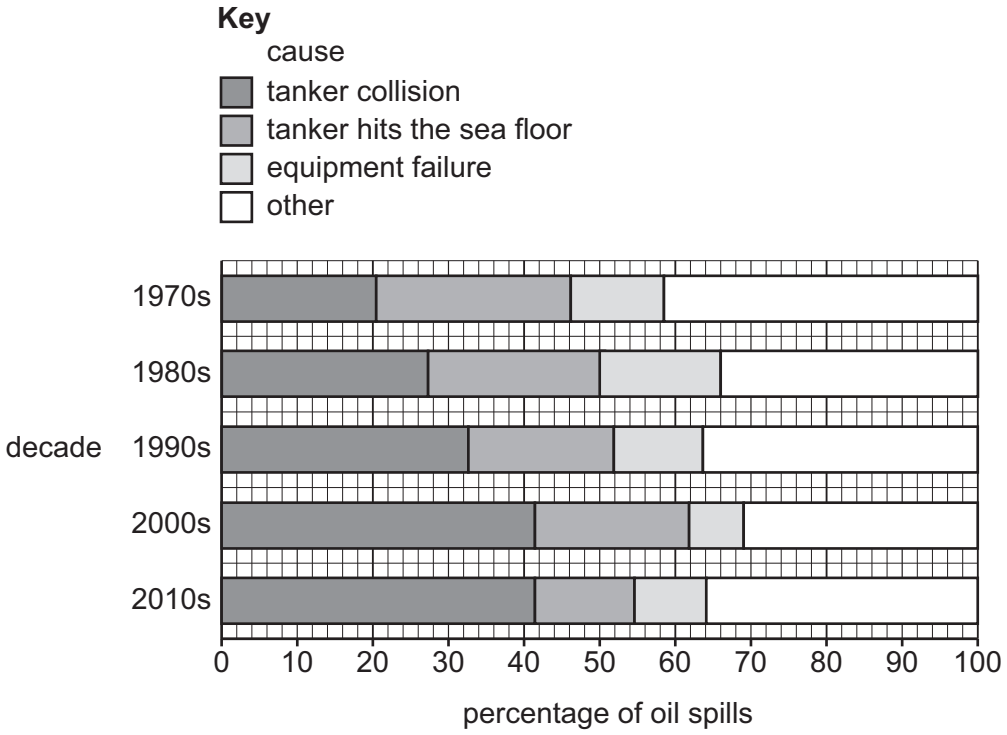
.....

.....

..... [3]

DO NOT WRITE IN THIS MARGIN

(b) The diagram shows the causes of marine oil spills of 7 tonnes or more in a 50-year period.



(i) Determine the percentage of marine oil spills due to equipment failure in the 1980s.

.....% [1]

(ii) Determine which cause is the **least** frequent during the 50-year period.

..... [1]

(iii) Suggest **one** cause in the 'other' category.

..... [1]

(c) Describe how booms reduce the impact of marine oil spills.

.....

.....

.....

..... [2]

DO NOT WRITE IN THIS MARGIN

(d) The photograph shows mussels on a rock in the ocean.

An oil spill occurs in the ocean where these mussels live.

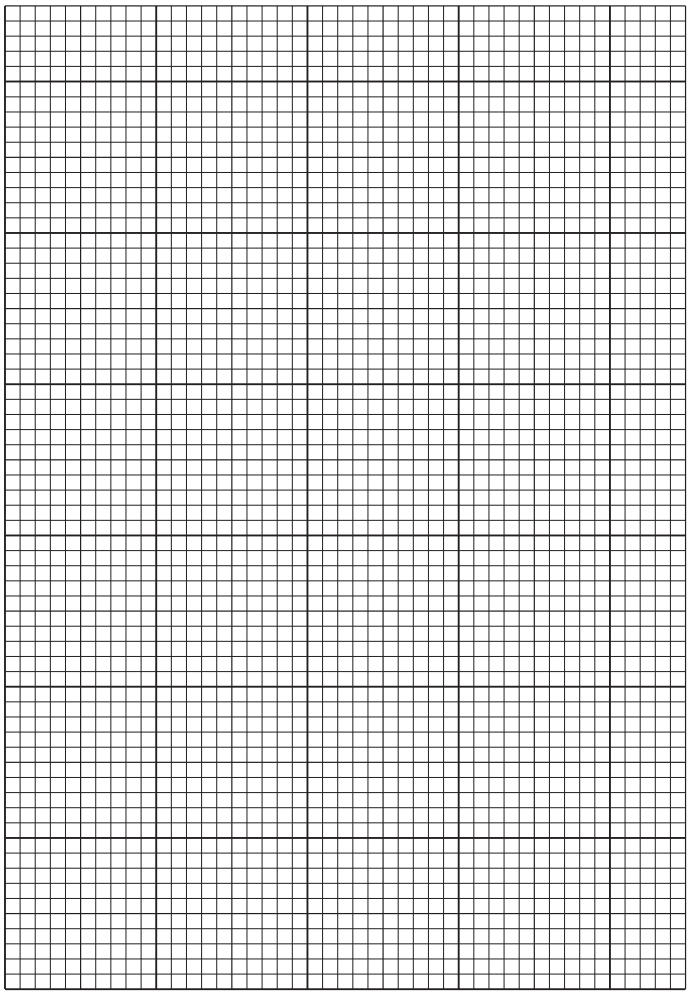
The table shows the oil concentration in the mussels after the oil spill.

day after oil spill	oil concentration in mussels / *ppm
0	0
1	480
3	600
4	420
5	110
10	50
15	40
30	0
35	0

*ppm = parts per million

DO NOT WRITE IN THIS MARGIN

(i) Plot the data as a line graph.



[4]

(ii) The mussels were moved to oil-free water at the end of day 3.

Use the table to describe the effect on the concentration of oil in the mussels after they are moved to oil-free water.

.....

.....

.....

..... [2]

DO NOT WRITE IN THIS MARGIN

(iii) Oil from spills can bioaccumulate in organisms.

Complete the sentence.

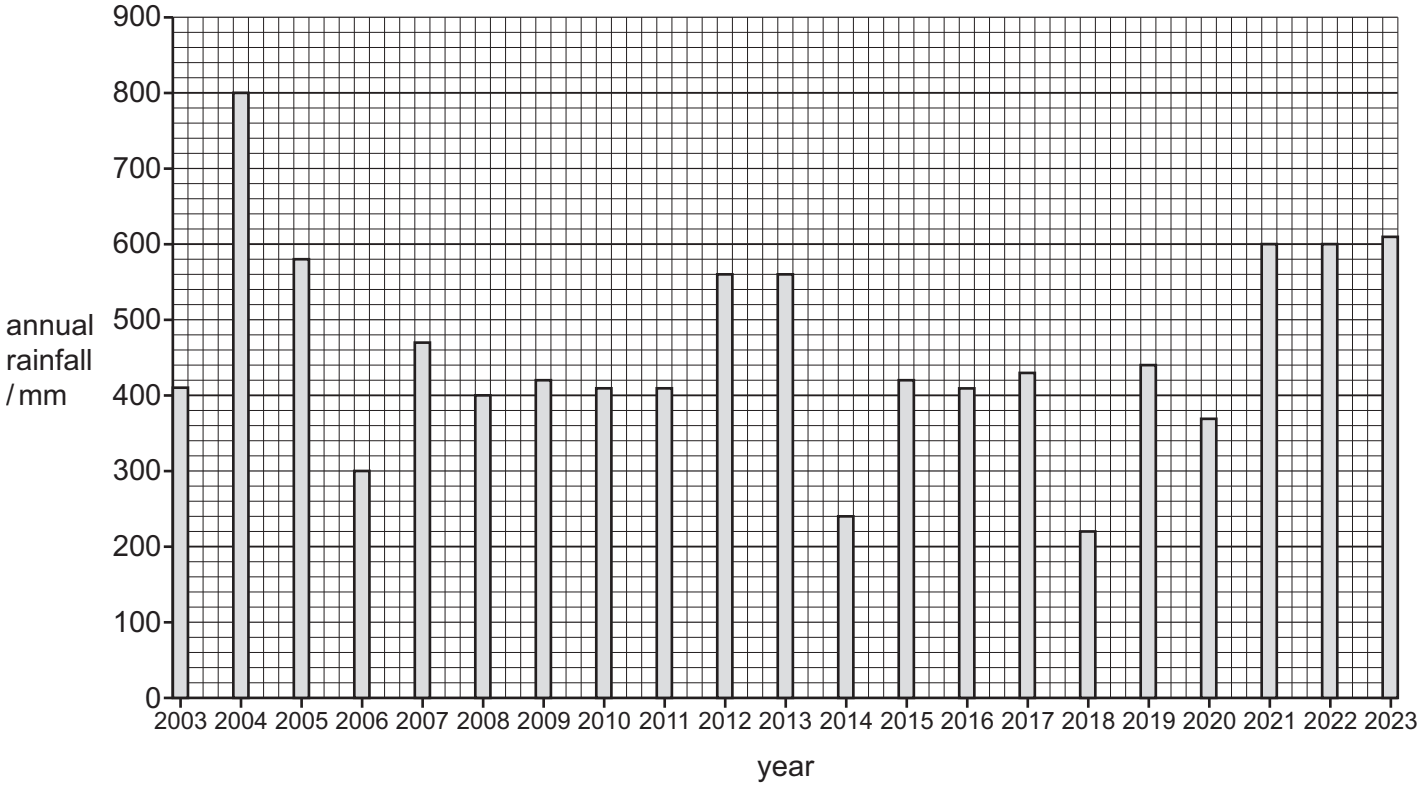
Bioaccumulation occurs when an organism ..... a substance at a rate faster than the substance is ..... .

[1]

[Total: 15]

DO NOT WRITE IN THIS MARGIN

5 **(a)** The bar chart shows the annual rainfall at a weather station from 2003 to 2023.



(i) Calculate the range in annual rainfall.

..... mm [2]

(ii) The mean annual rainfall is 460 mm.

Determine the number of years when the rainfall was greater than the mean.

..... [1]

DO NOT WRITE IN THIS MARGIN

(iii) Explain why crop yields decrease in years when the rainfall is much greater than the mean.

.....

.....

.....

.....

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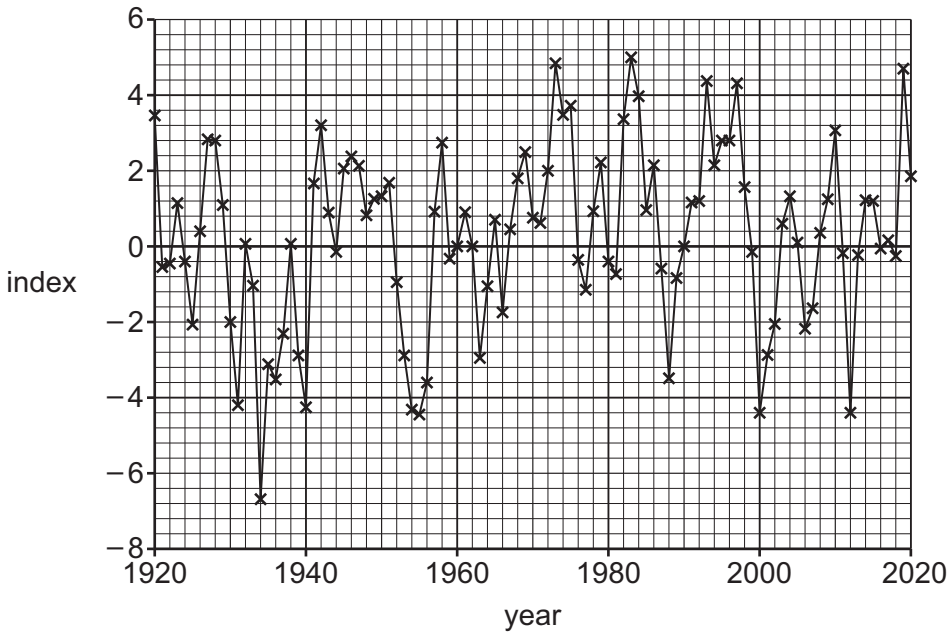
.....

..... [5]

(b) A drought severity index is a measure of drought conditions over time.

- A positive value is wetter than average.
- A negative value is drier than average.
- A value below –4 is an extreme drought.

The graph shows the drought severity index for the United States.



(i) Determine the number of years when an extreme drought occurred.

..... [1]

DO NOT WRITE IN THIS MARGIN

(ii) A student makes this conclusion from the data.

Between 2000 and 2020 there were more years with drought than without drought.

Is the student correct?
Give a reason for your answer.

.....

..... [1]

(iii) Suggest why the number of droughts could increase in the future.

.....

.....

.....

..... [2]

(iv) Suggest why droughts increase the risk of wildfires.

.....

..... [1]

(v) A report stated that in the United States in 2022 there were $21 billion of agricultural losses due to weather related disasters.

$20.4 billion were lost due to drought and wildfires.

Calculate the percentage lost due to drought and wildfires.

.....% [1]

(vi) Describe strategies for managing the impact of drought on agriculture.

.....

.....

.....

..... [2]

DO NOT WRITE IN THIS MARGIN

(c) One strategy to reduce the impact of drought is desalination of sea water by distillation.

Some statements about the distillation of sea water to produce drinking water are shown.

A drinking water is collected
B sea water is heated until it boils
C water vapour condenses
D water evaporates
E water vapour is cooled

Put the statements in the correct order. One has been completed for you.

				A

[2]

(d) Reservoirs are a source of fresh water.

A reservoir is formed when a dam is built.

(i) State **one** source of fresh water other than desalination and reservoirs.

..... [1]

(ii) A location experiences many periods of drought.

Suggest **three** reasons why a local government decides **not** to build a dam in this location.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

DO NOT WRITE IN THIS MARGIN

(e) Dams form part of a hydro-electric power scheme.

(i) Describe how electricity is generated in a hydro-electric power scheme.

.....

.....

.....

.....

.....

..... [3]

(ii) State **one** benefit of a multipurpose dam, other than as a source of fresh water and generation of electricity.

..... [1]

[Total: 26]

DO NOT WRITE IN THIS MARGIN

6 **(a)** The photograph shows a carp.

Carp were first released into Australian rivers in the 1800s. Australia is a country in Oceania. Before their release, carp were **not** found in Australia.

Suggest **two** reasons why these carp reduce biodiversity in Australia.

1 .....

.....

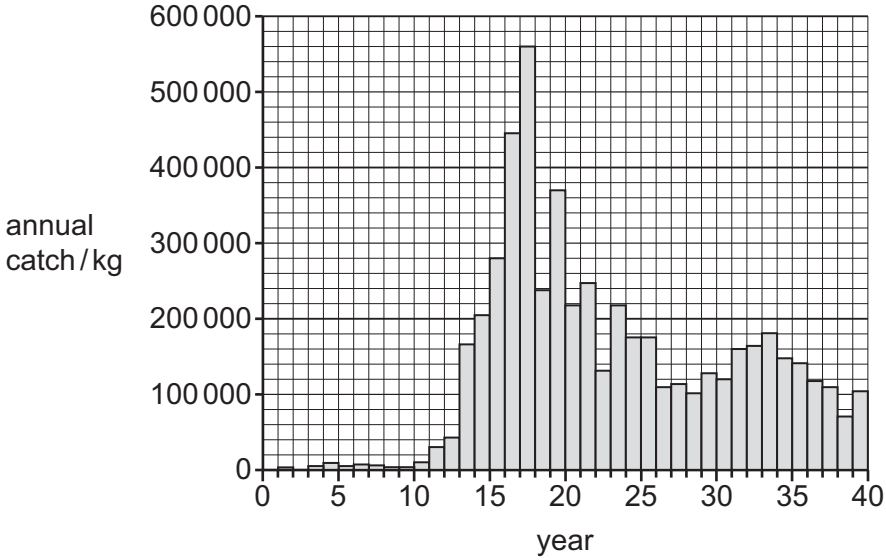
2 .....

.....
[2]

DO NOT WRITE IN THIS MARGIN

(b) Carp are now the most abundant large fresh water fish in the Murray and Darling rivers in Australia.

The bar chart shows the annual catch of carp in the Murray and Darling rivers over a 40-year period.



In year 4, some carp escaped into the Murray and Darling rivers from a fish farm.

Suggest **two** reasons why there is a large increase in annual catch between years 11 and 18.

1 .....

.....

2 .....

.....
[2]

(c) Scientists have identified a natural disease that causes high death rates in carp.

The scientists want to introduce this disease to the carp in Australia.

(i) Suggest **two** reasons why some people are against this method of controlling the carp population.

1 .....

.....

2 .....

.....
[2]

(ii) Name this method of pest control.

..... [1]

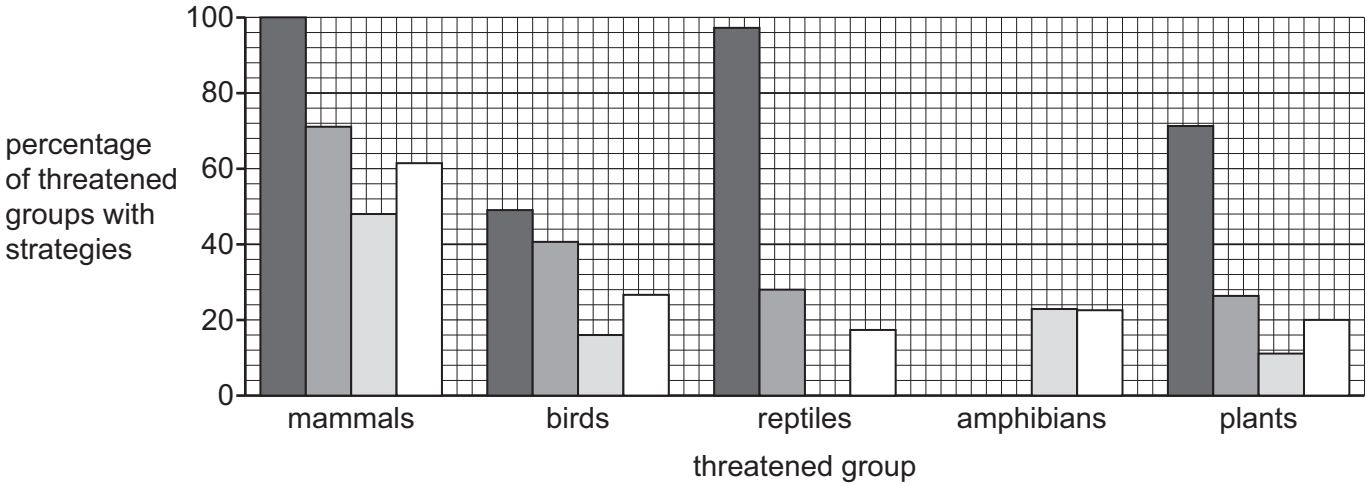
DO NOT WRITE IN THIS MARGIN

(d) The Australian government have strategies to protect some threatened groups of organisms.

The bar chart shows the percentage of threatened groups which have strategies to protect them.

Key

- critically endangered
- endangered
- vulnerable
- total: percentage of all species in each group that has some level of protection



Circle the threatened group that has the least total protection.

mammals **birds** **reptiles** **amphibians** **plants**

[1]

(e) **(i)** State **three** reasons why an ecological corridor increases the number of mammals.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) State **two** other strategies for increasing the number of mammals.

1 .....

.....

2 .....

.....

[2]

DO NOT WRITE IN THIS MARGIN

(f)

Climate change is the biggest threat to biodiversity.

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

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..... [6]

[Total: 19]

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