Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9039524108

ENVIRONMENTAL MANAGEMENT **5014/11**

Paper 1 **May/June 2015**

2 hours 15 minutes

Candidates answer on the Question Paper.

Additional Materials: Insert

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 **all** 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.

Write your answers in the spaces provided on the Question Paper.

All questions in Section A carry 10 marks.
Both questions in Section B carry 40 marks.

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.

The Insert is **not** required by the Examiner.

This document consists of **23** printed pages, **1** blank page and **1** Insert.

CAMBRIDGE International Examinations

Section A

Answer **all** the questions.

1 Look at the photograph, which shows an area where a rock is being extracted.

(a) (i) State the name and describe the method of rock extraction shown in the photograph.

name .....

method .....

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[3]

(ii) Explain the disadvantages of this method of extracting rock for people living nearby.

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.....[4]

(iii) Suggest **one** way in which the rock extraction industry can lead to benefits for the people living nearby.

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.....[1]

(b) Describe how the site shown in the photograph could be improved after rock extraction has finished.

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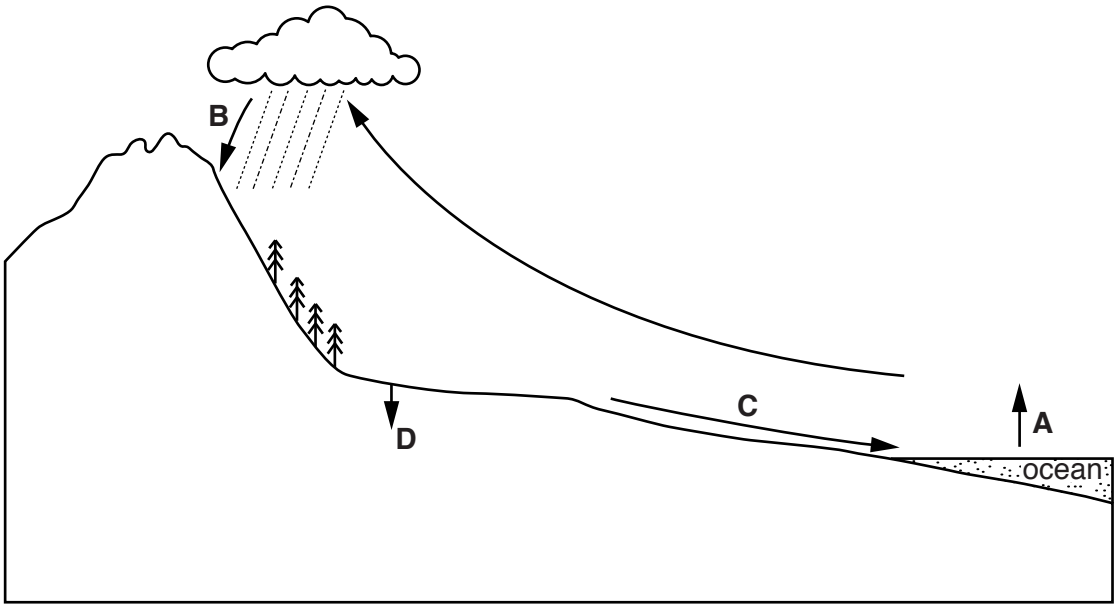
.....[2]

2 Look at the diagram of part of the water cycle.



Key

→ water cycle process

(a) (i) Describe the water cycle as shown by the processes **A**, **B** and **C** on the diagram.

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.....[3]

(ii) Name the process shown by arrow **D**.

.....[1]

(iii) Describe **two** ways in which vegetation affects the amount of water in the soil.

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2 .....

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[2]

(iv) State **three** reasons why the volume of water in some rivers is reduced by human activity.

1 .....

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2 .....

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3 .....

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[3]

(b) Suggest **one** reason why the water cycle does not operate as shown in the diagram in all areas of the world.

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.....[1]

3 Look at the table, which gives information about the most powerful cyclone in each year from 2002 to 2012. All occurred in the northern hemisphere, except the ones marked with an asterisk (*).

cyclone name	month and year	highest wind speed / km per hr	lowest pressure / mb	ocean region
Zoe	December 2002	285	890	South Pacific *
Maemi	September 2003	280	910	Western Pacific
Chaba	August 2004	290	879	Western Pacific
Wilma	October 2005	295	882	Atlantic/Caribbean
Monica	April 2006	285	905	South Pacific *
Dean	August 2007	280	907	Atlantic/Caribbean
Jangmi	September 2008	260	905	Western Pacific
Rick	October 2009	285	906	Eastern Pacific
Megi	October 2010	295	885	Western Pacific
Yasi	February 2011	295	929	South Pacific *
Sanba	September 2012	205	900	Western Pacific

* southern hemisphere

(a) (i) Name the **three** most powerful cyclones with the highest wind speed between 2002 and 2012.

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.....[2]

(ii) Identify the **three** months in the year in which the most powerful cyclones in the northern hemisphere occurred.

.....[1]

(iii) Explain why powerful cyclones occur in the northern hemisphere in the months you have chosen in **(a)(ii)**.

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.....[1]

(b) Explain the main impacts when powerful cyclones reach land.

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.....[3]

(c) Explain why cyclones of the same strength can have very different impacts in different countries.

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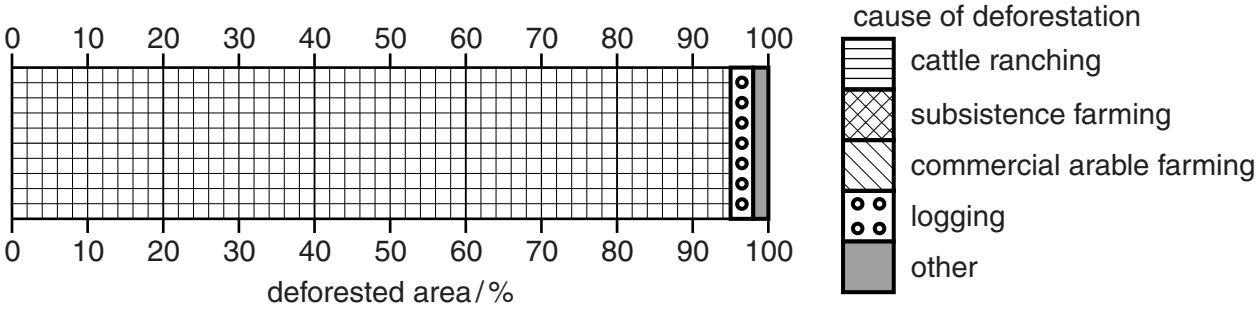
.....[3]

4 **(a)** Look at the table, which shows causes of deforestation in the tropical rainforest of the Amazon Basin.

cause of deforestation	cattle ranching	subsistence farming	commercial arable farming	logging	other	total
percentage of deforested area / %	67	22	6	3	2	100

(i) Use information from the table to complete the divided bar graph below. Use the key provided.



[3]

(ii) Suggest **one** cause of deforestation that is likely to be included in the 'other' category.

.....[1]

(b) **(i)** Explain how the clearance of large areas of tropical rainforest affects the people living in the forest.

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.....[2]

(ii) Describe sustainable methods for harvesting trees (logging) from the forest.

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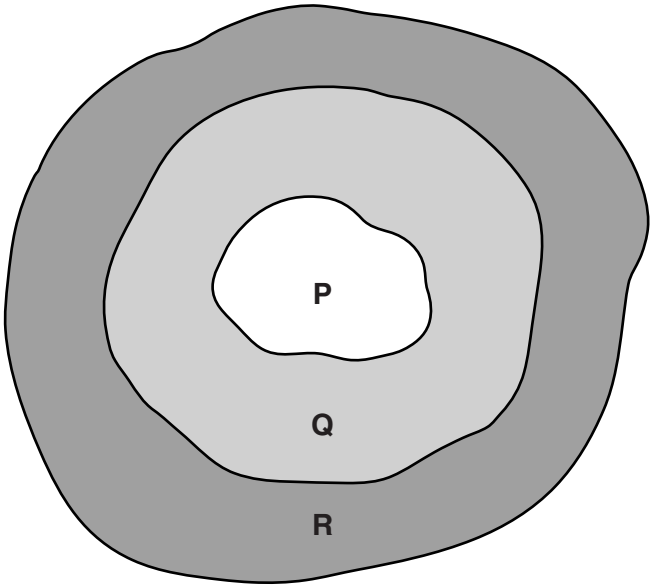
(c) World biosphere reserves have been set up in tropical rainforest areas. They have three zones, shown below as **P**, **Q** and **R**.



(i) Suggest which zone is protected by law and the reason it is protected.

zone .....

reason .....

.....
[1]

(ii) Controlled tourism is often encouraged in the other zones of world biosphere reserves. Suggest how it is controlled.

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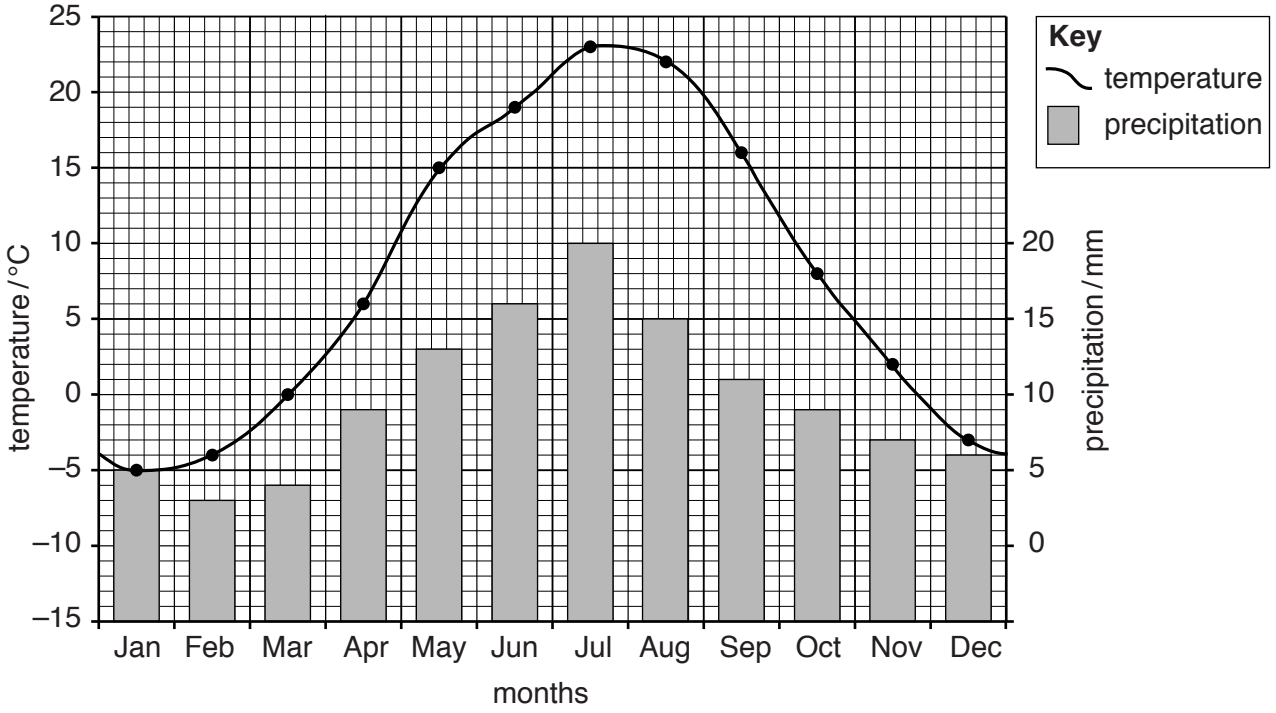
.....[1]

Section B

Answer **both** questions.

5 **(a)** Look at the climate graph for Aralsk, a town in Kazakhstan. Aralsk was on the northern edge of the Aral Sea.



(i) Describe the climate of Aralsk.

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(ii) Explain why the climate around Aralsk causes problems for farmers.

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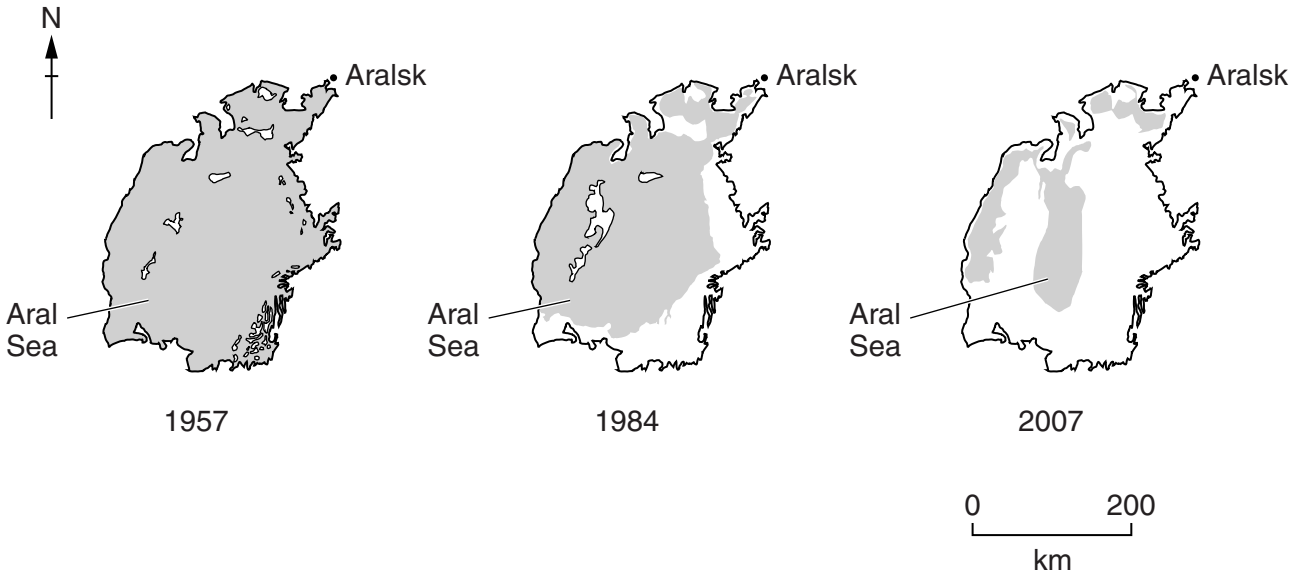
(b) Look at the maps showing changes to the size of the Aral Sea from 1957 to 2007.



Describe the changes to the Aral Sea from 1957 to 2007.

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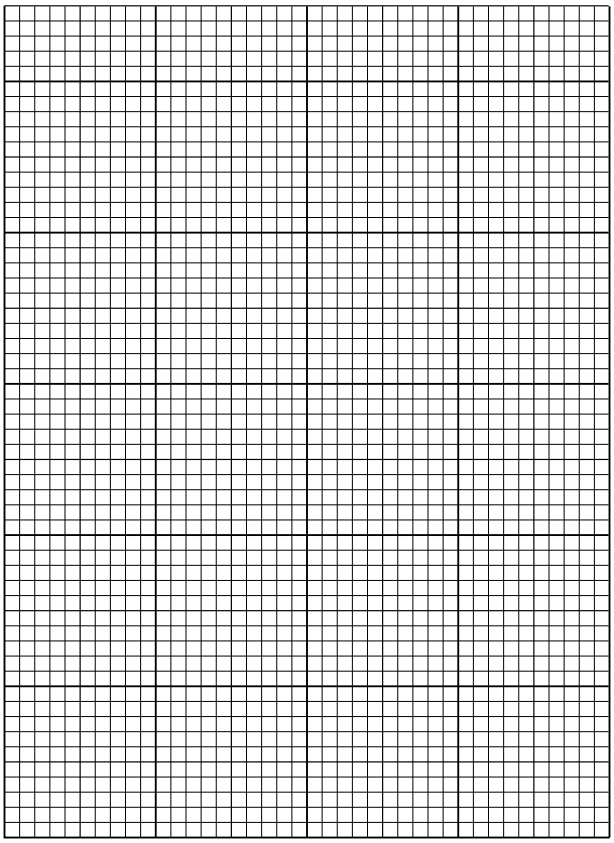
(c) Two rivers flow into the Aral Sea. Both have been dammed and the water is mainly used to irrigate crops of cotton, rice and wheat. The percentage of the water taken from the rivers from 1960 to 2000 is shown in the table.

year	percentage of water taken
1960	45
1980	95
2000	90

(i) Complete a bar graph on the grid below to show the data in the table. Label the axes.



[4]

(ii) In the year 2000, the total amount of water flowing down the two rivers was 120 km^3. Calculate how much of this water reached the Aral Sea.

..... km^3 [1]

(iii) The Aral Sea is an inland sea with no rivers flowing out of it. Suggest why the level of the sea went down when water from the rivers was still flowing into it.

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.....[2]

(d) Read the information below.

> **Environmental disaster in the Aral Sea**
>
> Large amounts of fertilisers and pesticides were used on irrigated crops. Some of these were washed into the rivers and into the Aral Sea. As the sea got smaller, it became increasingly salty. The reduction in the surface area of the sea altered the climate around the area. It has been described as an environmental disaster.

(i) Describe and explain the problems that these changes would have had on the Aral Sea ecosystem.

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(ii) Suggest how people living near the Aral Sea were affected by this environmental disaster.

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.....[3]

(e) Look at Photograph A (Insert) of soil erosion on a hillside.

(i) Most of the natural vegetation has been cleared for grazing. What was the natural vegetation?

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(ii) Describe what has happened to the hillside shown in the photograph since the natural vegetation was cleared.

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.....[2]

(iii) Explain **two** ways in which farmers can reduce soil erosion.

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(iv) Explain why soil erosion is a serious problem.

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(f) Can agriculture become sustainable and still feed a growing human population? Explain your answer.

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6 **(a)** Read the four definitions of ecosystem terms.

W A community of organisms, where each is eaten in turn by another.

X Organism that forms the base of a food chain by taking energy from the environment to create carbohydrates.

Y The place where a population (e.g. human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

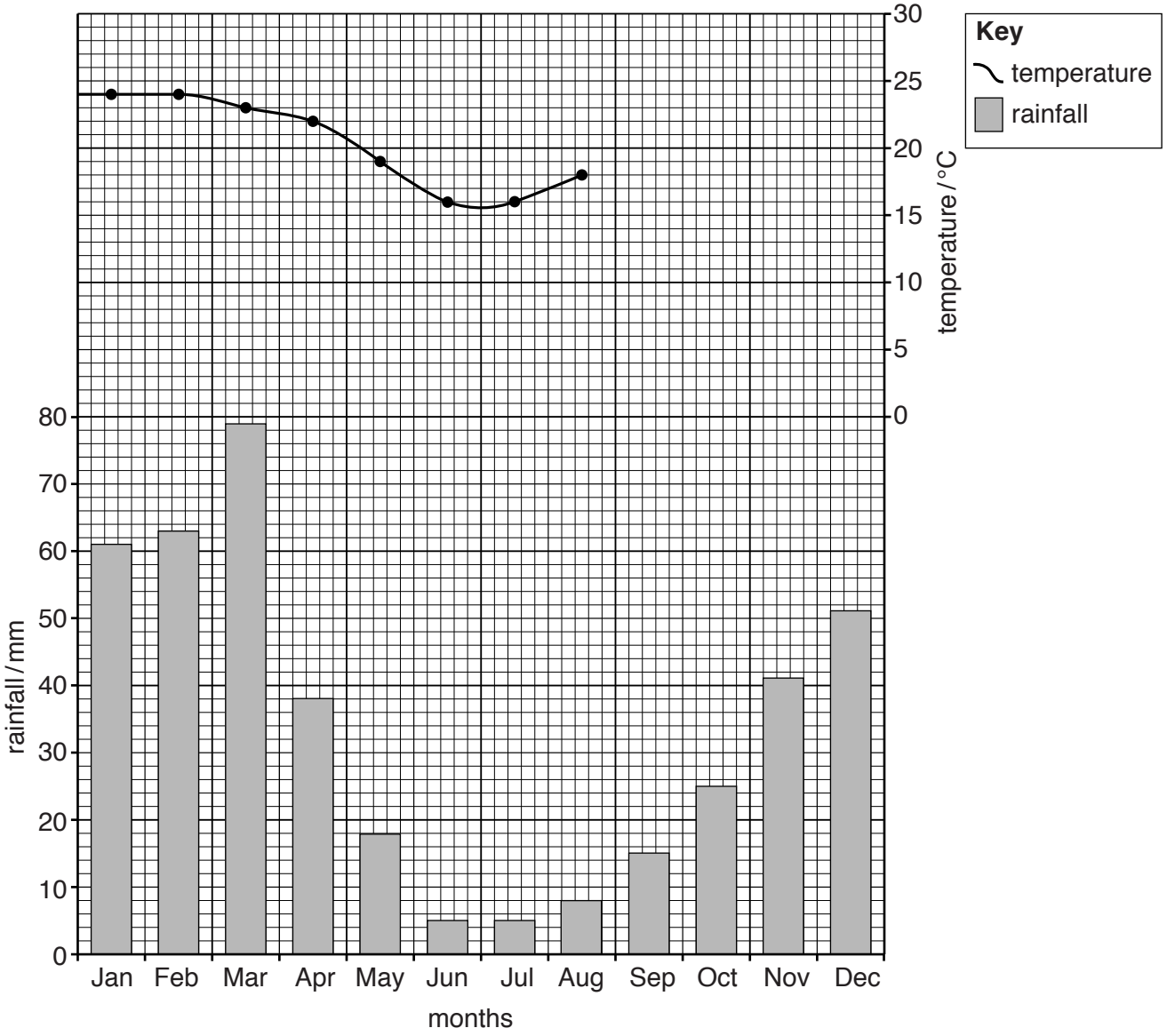
Z Total number of individual organisms of the same species living within a defined area.

Match the following terms to their definitions, labelled **W**, **X**, **Y**, **Z**:

term	**letter**
food chain	.....
habitat	.....
population	.....
producer	.....

[3]

(b) The graph shows climate data for a savanna region in southern Africa.



(i) Use the figures in the table to complete the climate graph.

month	Sep	Oct	Nov	Dec
average temperature / °C	23	27	26	24

[2]

(ii) Calculate the range of temperature.

.....°C [1]

(iii) Calculate how much rain falls in the driest three months.

.....mm [1]

(iv) State the season when the rainfall is lowest.

.....[1]

[Turn over

(v) Describe the appearance of vegetation in this savanna area in March and in August.

March .....

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August .....

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[3]

(vi) Give **one** reason to explain the differences in savanna vegetation in this area, in March and August.

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.....[1]

(c) Look at Photograph B (Insert), which was taken in the same area of savanna vegetation.

(i) Suggest why the elephants have visited the area shown in the photograph.

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(ii) Describe how the vegetation has been affected by the elephants.

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(iii) Suggest what would happen to the ecosystem if the elephant population increased.

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(d) In some parts of Africa, elephants cause problems for farmers and villagers. They eat the crops and animal fodder and destroy fences used to keep animals secure. Their numbers have grown in recent years as they are protected and trade in ivory (from their tusks) has been banned for many years. Some villagers think that the number of elephants need to be reduced.

Explain why the WWF (World Wide Fund for Nature) would oppose reducing the number of elephants.

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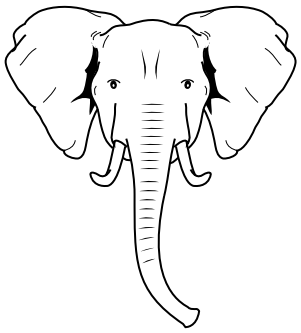
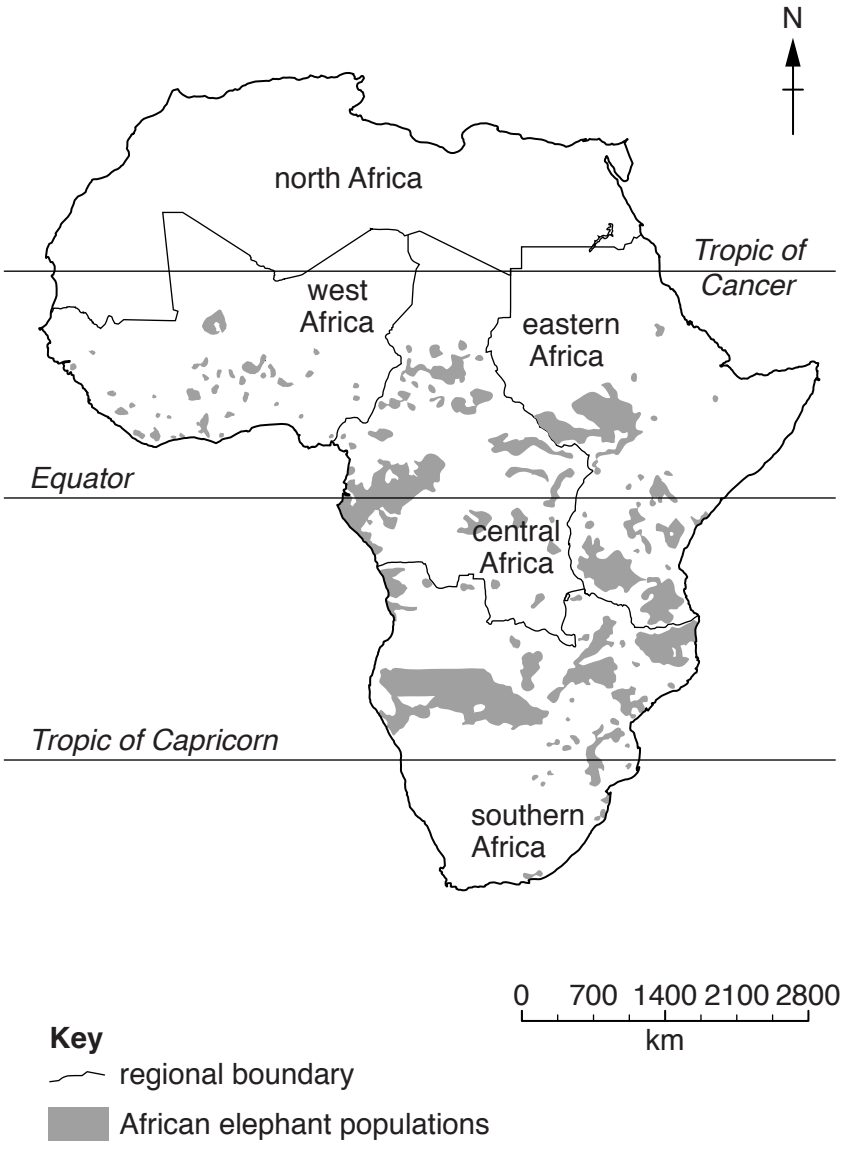
(e) Read the fact sheet about African elephant populations.



African elephants used to live in most of Africa. It is thought there may have been as many as 3-5 million African elephants 80 years ago. Elephants were hunted for trophies and their tusks. In the 1980s, an estimated 100 000 elephants were killed each year and up to 80% of herds were lost in some regions. In Kenya, the population fell by 85% between 1973 and 1989. Hunting is now banned in most African countries, but elephants are still being killed illegally for their tusks for ivory. Today, there are fewer than 700 000 left.

The map shows where African elephants are found today. In general, the elephant population is only increasing in the southern parts of Africa.



(i) How many African elephants are thought to be alive today?

.....[1]

(ii) Describe the distribution of the elephant population in Africa.

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(iii) Suggest why elephant numbers are increasing in southern parts of Africa, but decreasing in other parts of Africa.

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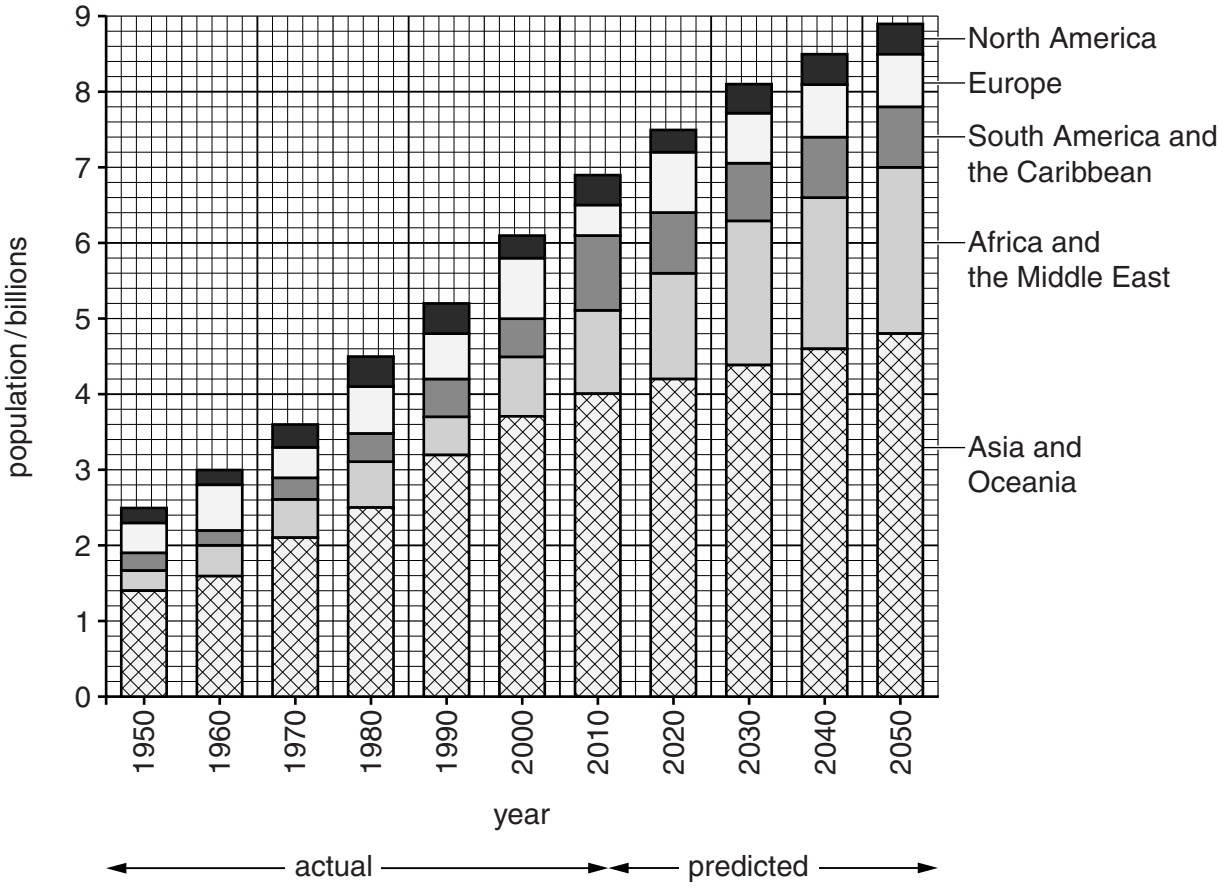
(f) Look at the graph which shows world human population by world region from 1950 to 2050.



(i) State the world population in billions in 1950.

..... billion [1]

(ii) State the predicted world population in billions in 2050.

..... billion [1]

(iii) Identify the world region which has had the largest population since 1950.

.....[1]

(iv) Estimate how many years it took for the world population to increase from three billion to four billion.

..... years [1]

(v) Explain the rapid increase in world population since 1950.

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.....[3]

(vi) Explain environmental problems that are caused by an increasing human population.

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