



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE
NAME

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CENTRE
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ENVIRONMENTAL MANAGEMENT

0680/23

Paper 2

May/June 2016

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

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 **both** questions.

Electronic calculators may be used.

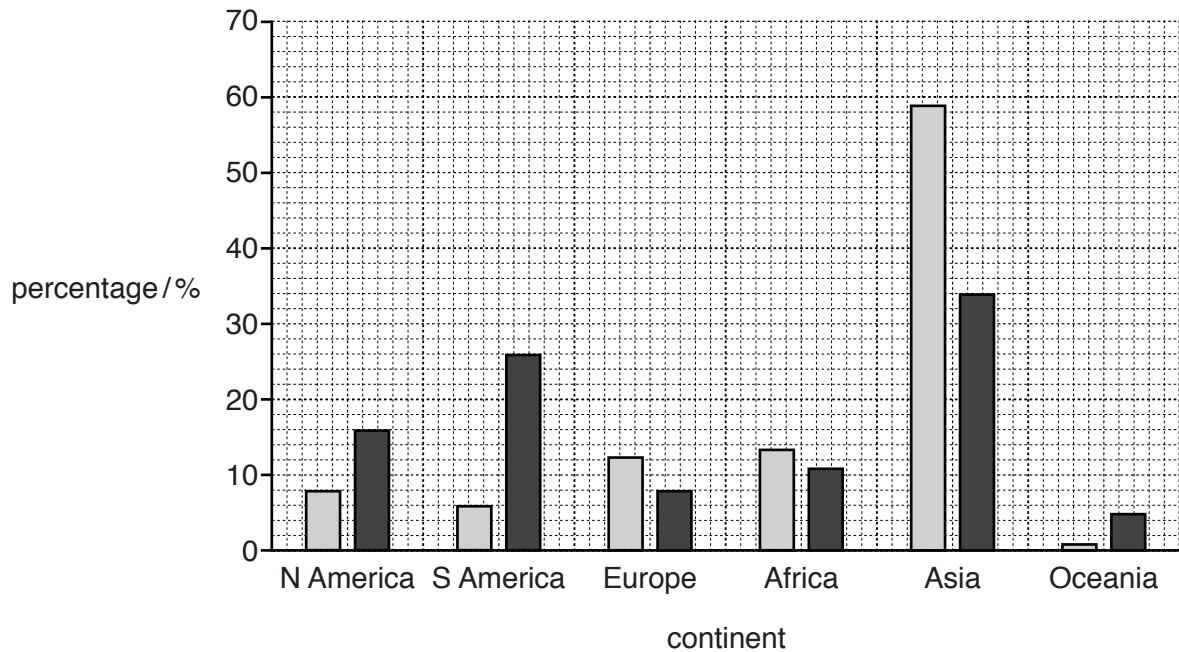
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

This document consists of **14** printed pages and **2** blank pages.

- 1 (a) Look at the graph, which shows population and water availability by continent as percentages of the world totals.



Key

□ % of world population

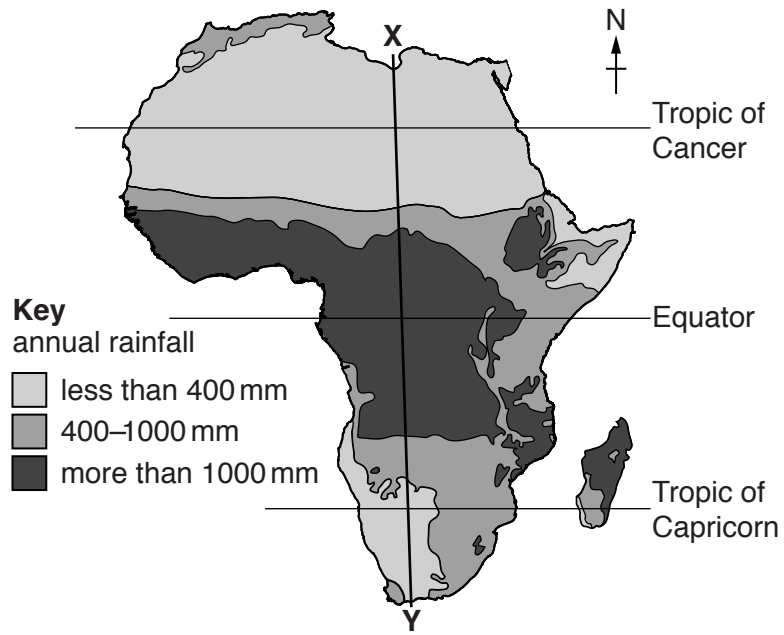
■ % of world water

Use the graph to complete the paragraph below.

Africa, Asia and have a larger percentage of the world's population than of the world's water. Oceania has% of the world's water, the lowest amount of any continent. South America has the greatest excess of water with% of the world's water and% of the world's population.

[4]

(b) Look at the map of annual rainfall in Africa.



(i) Describe how annual rainfall varies along the line X–Y.

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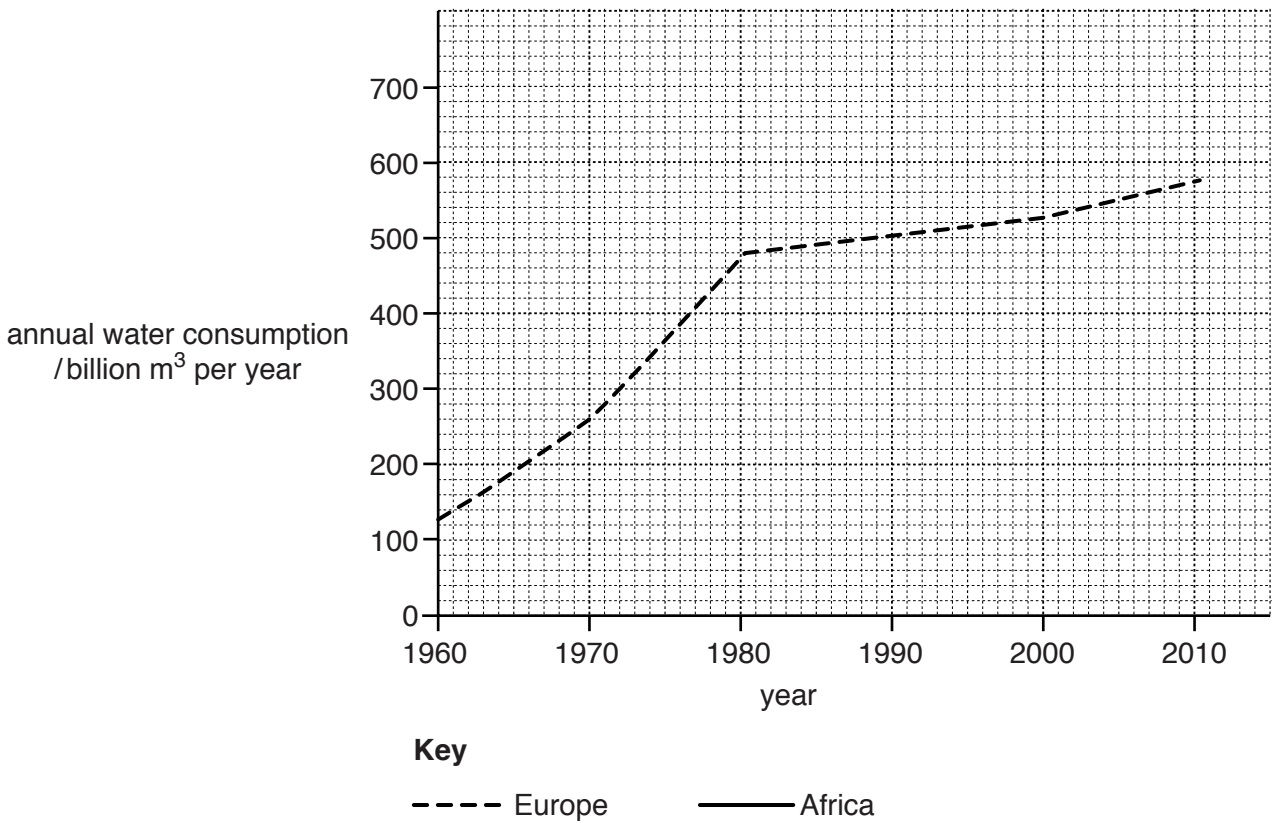
 [4]

(ii) Suggest which parts of Africa will have a shortage of water for use by people.

.....

 [2]

(c) The graph below shows annual water consumption in Europe from 1960 to 2010.



(i) Use the figures in the table to plot a line graph for annual water consumption in Africa on the grid above. [2]

year	1960	1970	1980	1990	2000	2010
annual water consumption in Africa /billion m ³ per year	80	100	140	210	220	250

(ii) Compare the consumption of water in Europe before and after 1980.

.....
[1]

(iii) Europe and Africa have similar populations. Suggest reasons why water consumption is higher in Europe than in Africa.

.....

[3]

(d) Look at the photograph, which shows a valley where a dam and reservoir are planned. Dams and reservoirs store water for human use.



(i) State **three** advantages of this location for creating a dam and reservoir.

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.....[3]

- (ii) Describe how the creation of a dam and reservoir could affect the ecosystems of the area.

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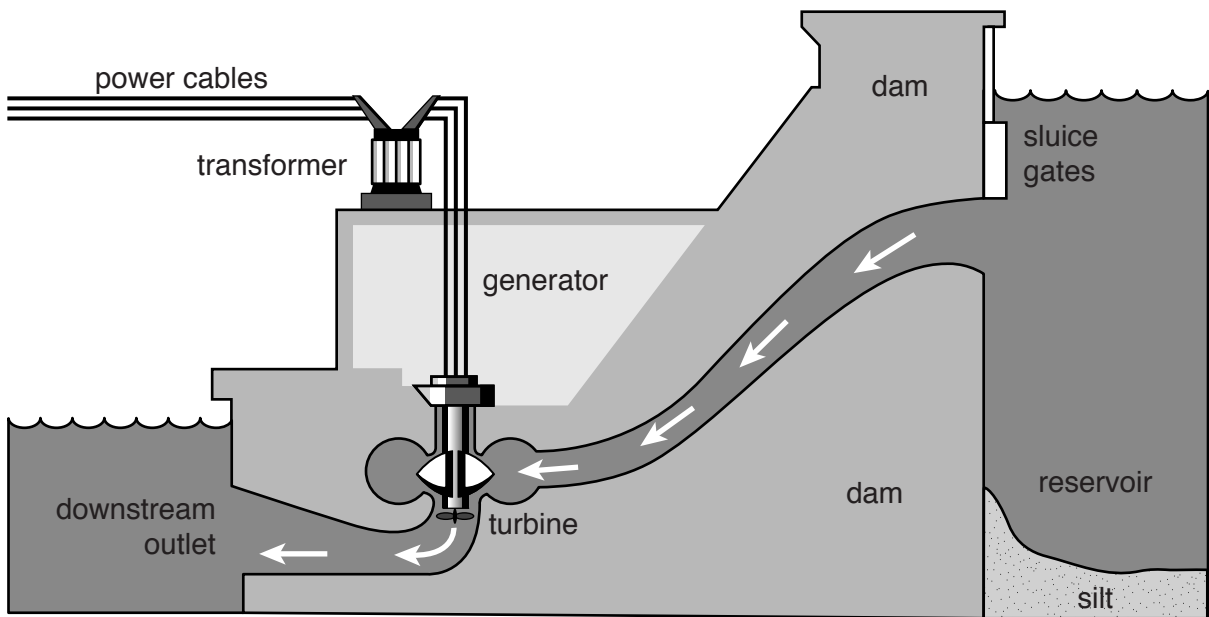
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- (e) Some dams and reservoirs are used for hydro-electric power (H.E.P).



- (i) Using the diagram, describe how electricity is produced in a hydro-electric power (H.E.P) station.

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(ii) Is hydro-electric power (H.E.P.) a sustainable energy source? Give reasons for your answer.

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.....[3]

(f) Bilharzia is a water-based disease caused by a parasite. Describe the life cycle of this parasite and its effects on humans.

life cycle

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effects on humans

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[5]

2 (a) Choose from the following list of terms to complete the table. [4]

- consumer food chain food web**
photosynthesis respiration plant (vegetational) succession

definition	term
The process in which green plants use sunlight.	
A diagram showing all possible feeding relationships of organisms in an ecosystem.	
The change in plant species over time from bare ground to a climax community.	
The process in which green plants and animals release energy, carbon dioxide and water.	

(b) The table below shows climate data for three weather stations in locations **A**, **B** and **C**.

weather station location	latitude /°N	annual rainfall /mm	length of dry season /months	average annual temperature /°C	annual range of temperature /°C
A	4	2300	2	26.0	2.4
B	12	920	7	26.7	7.2
C	18	230	10	28.9	11.4

(i) Describe how the following change from weather station **A** to weather station **B**.

average annual temperature

.....

annual range of temperature

.....

[2]

(ii) Calculate the decrease in annual rainfall between weather stations **A** and **B**.

Space for working.

..... mm [1]

(iii) State the relationship between annual rainfall and the annual range of temperature shown in the table.

.....

.....[1]

(iv) State the type of natural vegetation likely to be found at each of the weather station locations **A**, **B** and **C**.

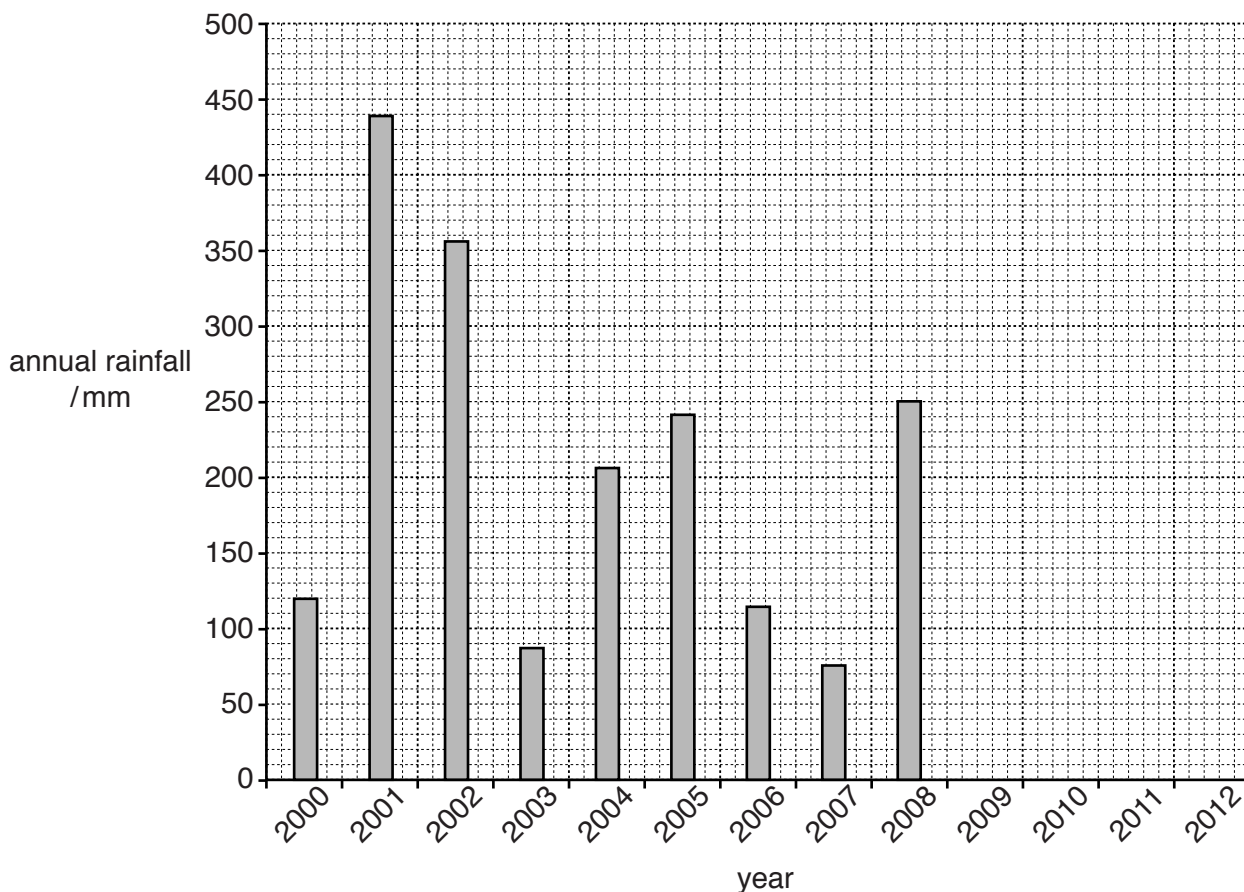
A

B

C

[3]

(c) Look at the graph, which shows annual rainfall in a desert region.



(i) Complete the annual rainfall graph using the figures in the table.

[2]

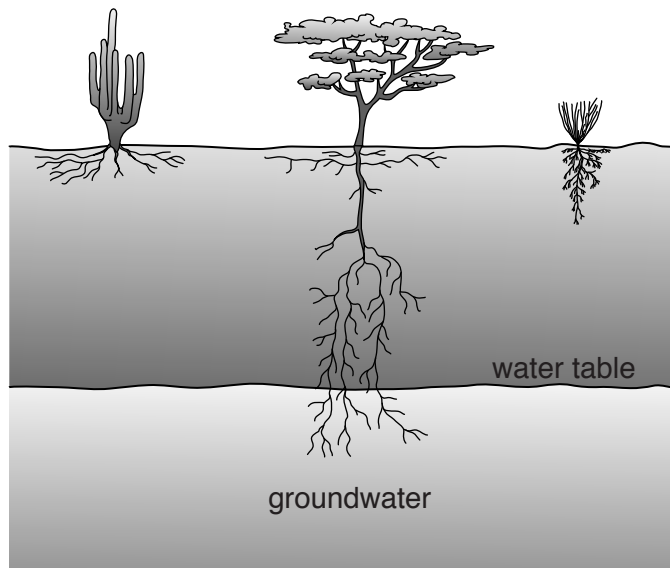
year	annual rainfall/mm
2009	100
2010	350
2011	170
2012	70

(ii) The average annual rainfall is 200 mm. Show this by drawing a line at 200 mm on the graph. [1]

(iii) State how many years had below average annual rainfall.

..... years [1]

(d) Look at the drawing of desert vegetation.



(i) Using the diagram and your own knowledge, describe how vegetation has adapted to desert conditions.

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(ii) Suggest ways in which desert vegetation can be damaged.

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.....[2]

(iii) Explain how agriculture is possible in some desert areas.

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.....[2]

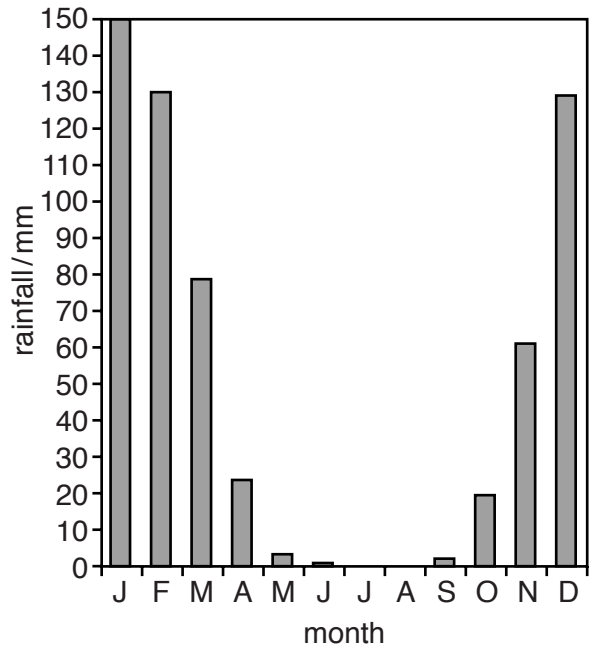
- (e) One way to conserve ecosystems is by the creation of national parks. Look at the information about the Chobe National Park in Botswana.

Chobe National Park

Chobe National Park covers 10 566 km². The north of the park, which borders the Chobe River, receives the most rainfall. The amount of rainfall decreases rapidly to the south. Temperatures are high throughout the year. The graph below shows the average monthly rainfall for the northern part of the park.

The original inhabitants were hunter-gatherers with nomadic pastoralists in the south. There was some forestry, but by 1975 that had stopped and all the people living in the park were resettled elsewhere.

The park has a wide variety of animals, with large numbers of elephants, zebras and antelopes, as well as predators such as lions and hyenas.



- (i) Describe the location of Chobe National Park.

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.....[2]

(ii) Explain the purpose of national parks.

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..... [2]

(iii) Explain the terms *hunter-gatherer* and *nomadic pastoralist*.

hunter-gatherer
.....
nomadic pastoralist
..... [2]

(iv) Suggest the month when much of the wildlife will start to migrate northwards to the Chobe River.

..... [1]

(v) Explain the reasons for this migration.

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..... [2]

(vi) Suggest why Chobe National Park attracts many international tourists.

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..... [2]

- (f) Tourism has benefits for Botswana's national parks, but also causes environmental problems. Do the benefits of such tourism outweigh the problems? Explain your answer.

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.....[6]

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