



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER



ENVIRONMENTAL MANAGEMENT

0680/22

Paper 2

May/June 2014

1 hour 45 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler

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.

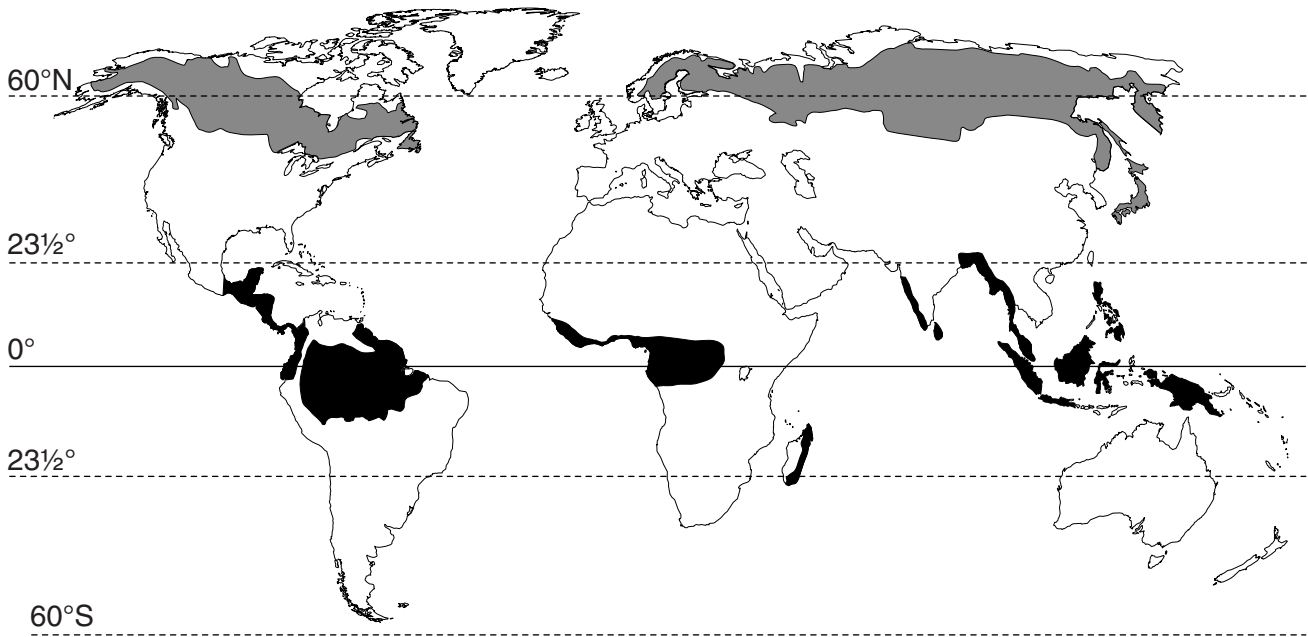
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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 **17** printed pages and **3** blank pages.

- 1 (a) Look at the map showing the world distributions of two biomes, tropical rainforest and taiga forests.

location of tropical rainforest and taiga forest biomes



Key

-  taiga forest
-  tropical rainforest

- (i) Describe where tropical rainforests are located.

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..... [2]

- (ii) Describe where taiga forests are located.

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..... [2]

- (iii) State the most important difference between the distribution of taiga forest and tropical rainforest.

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..... [1]

(b) Some of the characteristics of the vegetation in the two biomes are given in the table. Complete the table by filling in the empty boxes.

| | tropical rainforests | taiga forest |
|---------------------------------|--|---|
| A forest characteristics | | |
| 1 biodiversity | many species of tree in 50 hectares | two or three species of tree in 50 hectares |
| 2 forest layers | 4 or 5 | |
| 3 tree shape | 1. tall and slim trunks, 2. branches and leaves mainly at the top | 1. 2. |
| B leaf characteristic | | |
| C example of named tree | mahogany | |

[6]

(c) Look at the table showing a summary of the climates for tropical rainforests and taiga forests.

| | temperature/°C | | precipitation/mm | | |
|--|--------------------------|--------|-------------------|---------------|--------------|
| | mean monthly temperature | | mean annual total | wettest month | driest month |
| climate | highest | lowest | | | |
| equatorial for tropical rainforest | 28 | 26 | 2000 | 270 | 150 |
| cool temperate interior for taiga forest | 14 | -12 | 500 | 70 | 20 |

(i) Calculate the annual range of temperature in taiga forest.

Space for working.

..... °C [1]

(ii) Use the climate data to explain two differences in vegetation characteristics between tropical rainforest and taiga forest.

difference

explanation

.....

difference

explanation

..... [3]

(iii) The table below shows the percentage of tropical rainforest and taiga forest cleared by people.

tropical rainforest
45% already cleared

taiga forest
less than 5% cleared

Suggest how the climates of the two biomes explain this difference.

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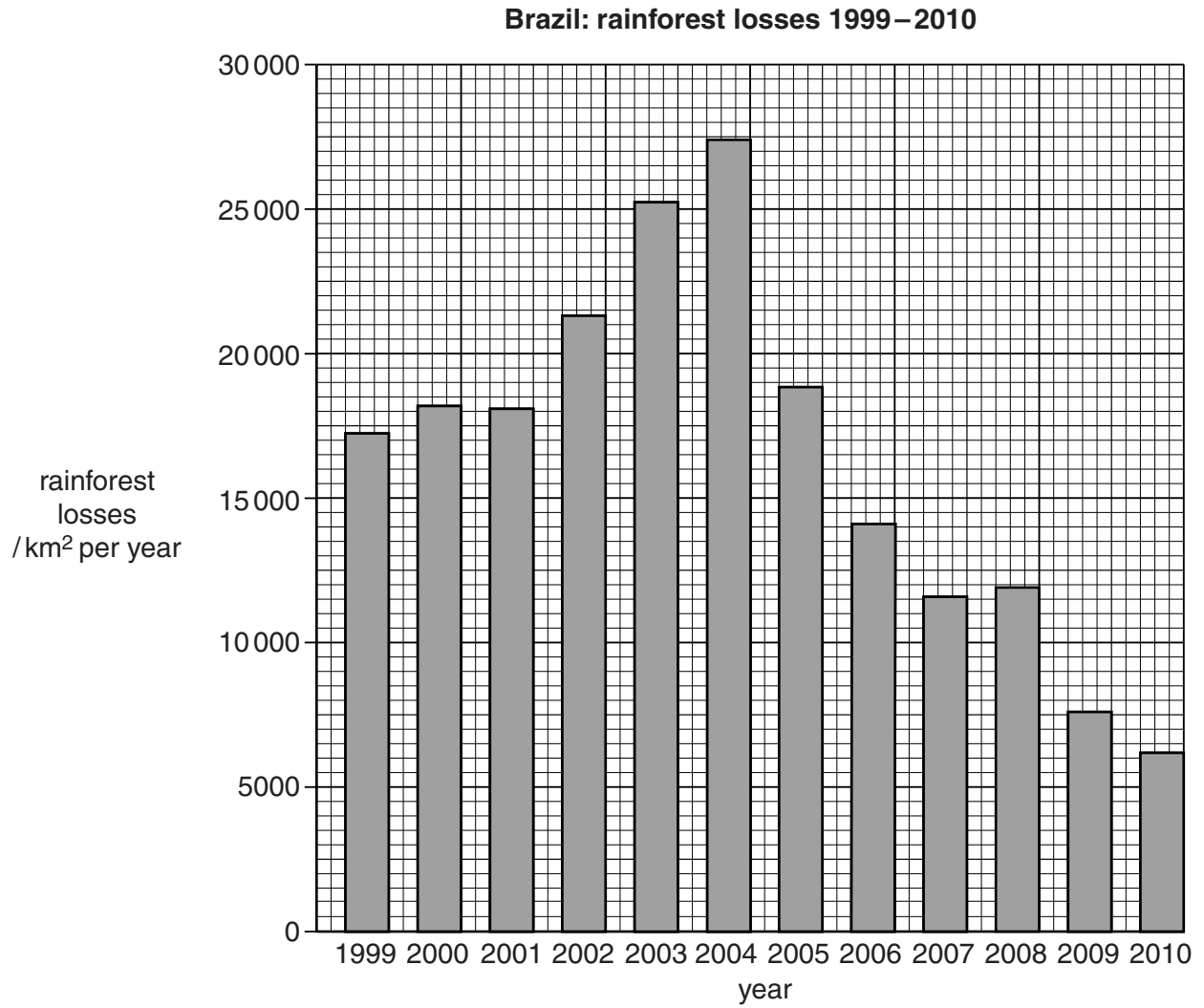
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..... [3]

(d) Environmental groups are concerned about tropical rainforest losses in Brazil.

Look at the bar graph showing estimates of forest clearances from 1999 to 2010.



(i) Describe the trends shown by the graph on page 6.

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(ii) Discuss the extent to which the graph shows that the environmental groups should be concerned about the clearance of the tropical rainforest in Brazil.

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- (e) One strategy for tropical rainforest conservation is to create a biosphere reserve. One example is the Maya biosphere reserve in Guatemala. It was created in 1990 to protect the largest remaining area of tropical rainforest in Central America. Map A shows its location and map B shows the zones within it.

map A

location of Maya biosphere reserve

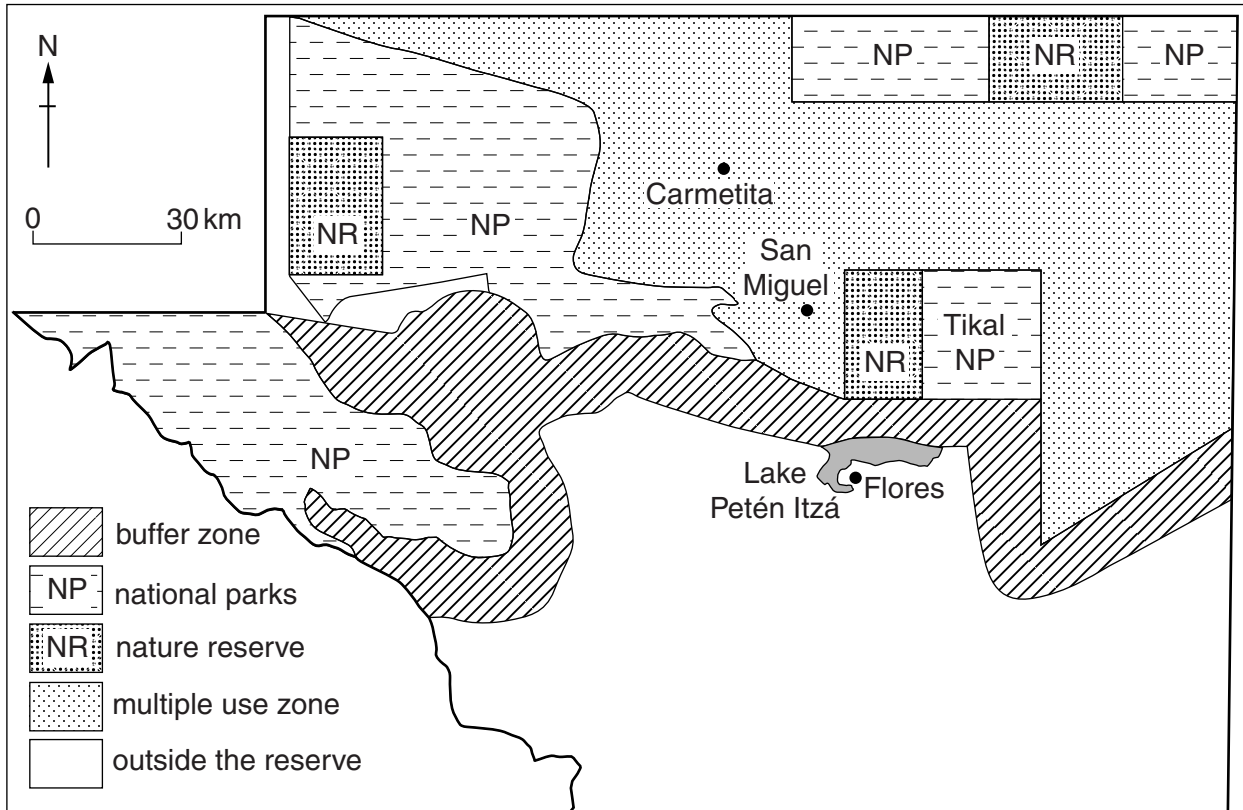


Key

-  Maya biosphere reserve
-  mountain region
-  capital city
-  other main cities and towns

map B

zones inside the Maya biosphere reserve



(i) Name the **two** land uses where conservation of the rainforest will be greatest.

..... [1]

(ii) How does this give protection to the rainforest?

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..... [1]

(iii) Describe where the buffer zone is located **and** suggest its purpose.

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..... [2]

- (iv) People living in the multiple use zone are encouraged to follow new economic activities, such as the sustainable harvesting of forest products rather than slash and burn subsistence farming.

A Fair Trade group has been organised to buy and export products.

Explain how **and** why these new economic activities can increase the chances of remaining areas of forest being conserved by the local people.

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..... [3]

- (v) Tikal, with its Mayan pyramids, attracts 200 000 visitors a year many of them from overseas.

Suggest what can be done to try to ensure that local people can share in some of the economic benefits from tourism.

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- (vi) Government figures show that the Maya biosphere reserve has lost 21% of its forest cover since being declared a protected zone in 1990. Some losses are due to illegal activities, such as production of drugs and forest clearance for airstrips to export the drugs.

Suggest why the government find it difficult to protect the forest from clearance.

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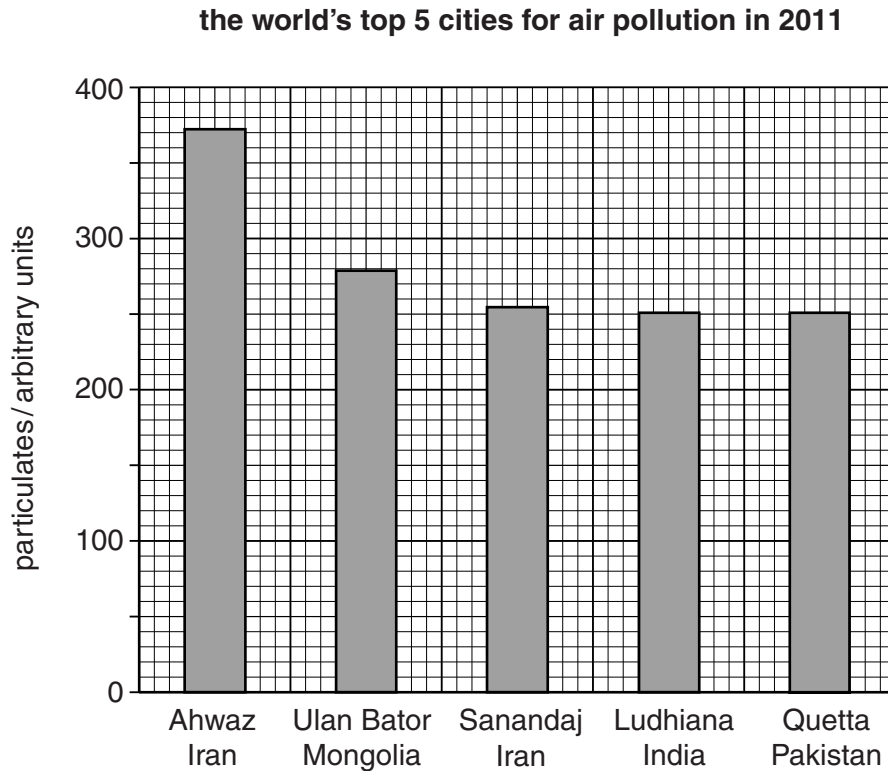
- (vii) Many biosphere reserves are located in countries where average incomes are low, such as Guatemala.

To what extent is the strategy of creating biosphere reserves likely to be successful? Explain your answer.

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[Total: 40]

- 2 (a) The bar graph shows the results of a survey in 2011, which identified the five cities with the world's highest urban air pollution. It was based on the measurement of particulates (such as smoke particles) in the atmosphere.



- (i) The World Health Organisation (WHO) recommends 20 arbitrary units as a safe limit for particulates.

On the graph above, draw a line to show this safe limit. [1]

- (ii) Approximately how many times higher were the particulates in Quetta than the WHO safe limit?

Circle one answer.

5 times 9 times 12 times 18 times [1]

- (iii) Describe how high levels of air pollution can affect economic activity in a city.

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- (iv) One of the reasons for the high levels of air pollution in these cities is the burning of fuel oil, firewood and dried dung.

Suggest reasons why it is difficult to reduce the amount of particulates going into the atmosphere in cities such as these.

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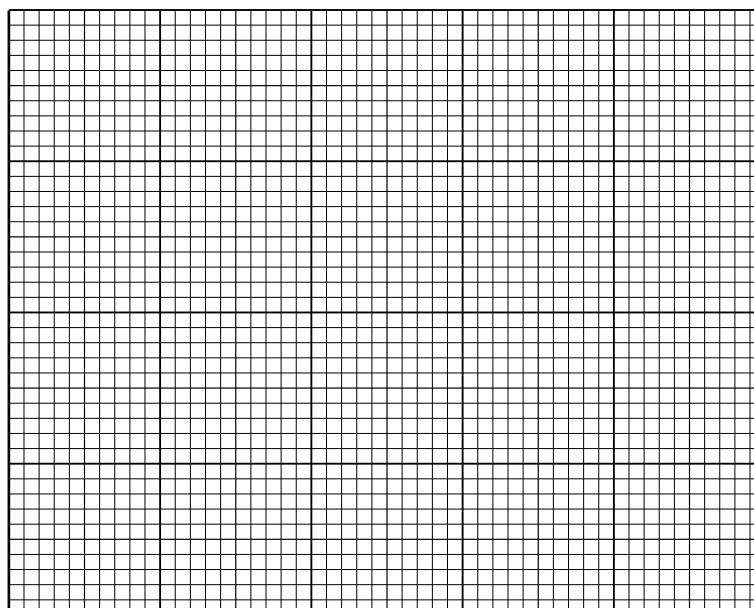
..... [3]

- (b) (i) Particulate amounts in four of the world's cities are given in the table.

| city | country | particulates /arbitrary units |
|-------------|---------|-------------------------------|
| Beijing | China | 121 |
| Mexico City | Mexico | 30 |
| Los Angeles | USA | 25 |
| New York | USA | 21 |

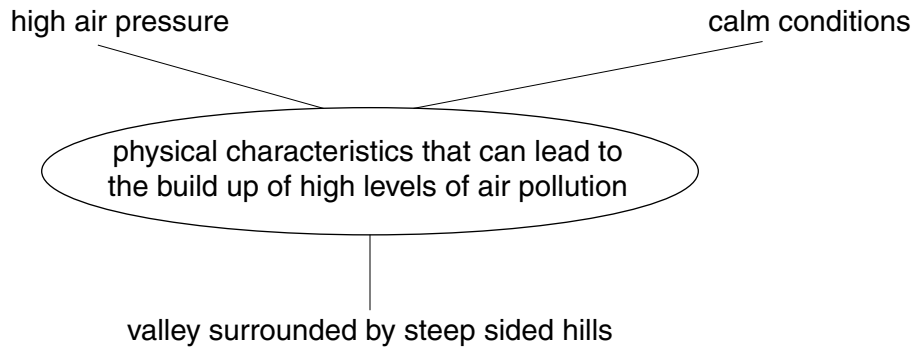
On the grid below, draw a bar graph of particulate amounts in Beijing, Mexico City, Los Angeles and New York.

air pollution in four of the world's cities



[3]

- (ii) There are certain physical characteristics which increase the chances of high levels of air pollution in cities. Three of these are named in the spider diagram.



Explain how these physical characteristics can lead to the build up of high levels of air pollution.

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- (iii) Describe strategies that can be used to improve the air quality in cities.

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- (iv) Explain the problems that governments have in implementing strategies to reduce air pollution in cities.

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- (c) Read the newspaper report about an air pollution accident in Bhopal, India in December 1984.

Disaster in Bhopal

A gas leak from a pesticide factory has killed more than 25 000 people. A large cloud of poisonous gas covered the shanty towns around the factory. The health of about 250 000 people living further away is thought to be at risk. People in Bhopal had little idea about the dangers of living next to a factory producing toxic chemicals.

The accident was caused by design faults in the factory’s safety systems and by poor maintenance.

In the United States of America, factories making such toxic chemicals must be located at least 80 kilometres away from the nearest settlement.

- (i) State two ways in which the factory’s managers could have reduced the risk of a gas leak from this factory in Bhopal.

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..... [2]

- (ii) Suggest why there was a greater loss of life in India, a developing country, than there would have been if the accident had happened in the United States of America, a developed country.

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- (d) Read this newspaper report written in 2009.

25 years later; the effects of the disaster are still being felt by the people of Bhopal

More than 25 000 people have died and at least 500 000 have serious health problems, such as cancer, anaemia, infertility and birth defects. Large areas around the factory have been labelled a ‘global toxic hot-spot’, unfit for any kind of use.

The factory site remains closed and abandoned, with thousands of tonnes of toxic wastes stored there. In the monsoon season, the rains wash these chemicals into the groundwater, contaminating local wells. These contain mercury concentrations thousands of times higher than WHO (World Health Organisation) recommended limits. An estimated 90 per cent of local people have to use this well water. They complain that not enough water is being piped in by the authorities.

- (i) Describe and explain the long-term effects of the Bhopal disaster.

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- (ii) Give **three** reasons why people could still be suffering from the effects of this disaster in another 25 years time.

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- (e) Human activities damage environments in many ways, such as the impact of mineral exploitation.

Discuss what measures could be taken to restore such damaged environments.

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..... [6]

[Total: 40]

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