UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

5827153850

ENVIRONMENTAL MANAGEMENT **0680/02**

Paper 2 **May/June 2009**

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 a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **both** questions.

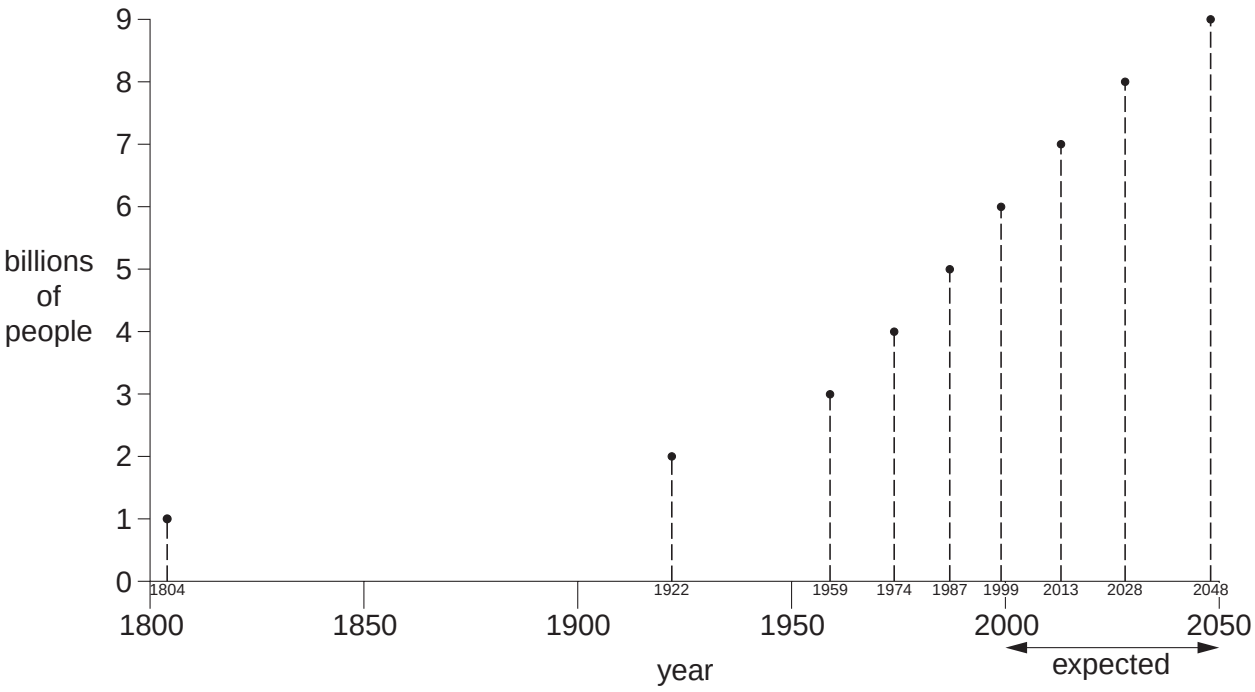
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
Total	

This document consists of **17** printed pages and **3** blank pages.

1 **(a)** World population keeps on growing.

World population growth



(i) Draw in the line on the graph to show world population growth. [1]

(ii) How many years did it take for the world population to grow from one to two billion?

..... [1]

(iii) What was the least number of years it took for world population to increase by one billion?

..... [1]

(iv) Describe what the graph shows about expected future population growth compared with past growth.

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..... [2]

(b) Some countries have population policies to reduce rates of population growth.

(i) Name one country which has a population policy.

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(ii) Describe its main features.

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(iii) Comment on whether or not it has been successful.

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[5]

(c) State two reasons why governments in some developing countries have not introduced a population policy.

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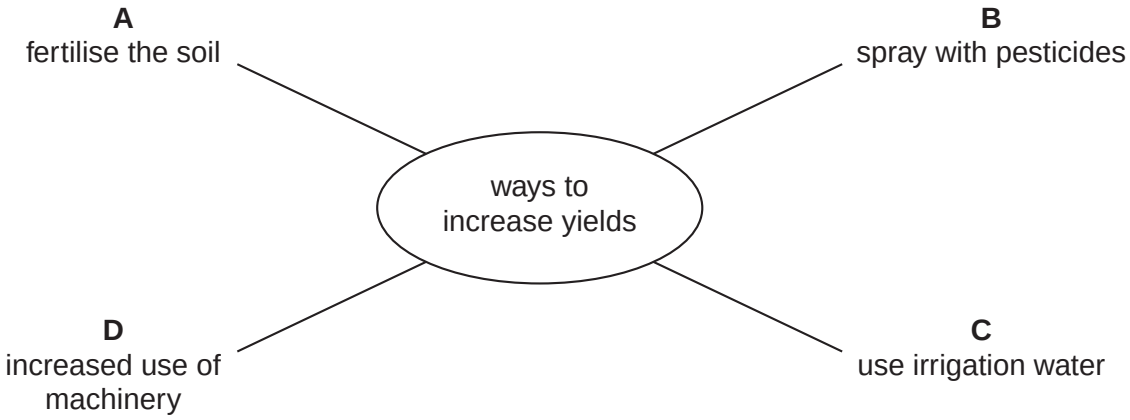
(d) More food needs to be produced to feed the world's growing population. Four agri techniques used by farmers to increase food output are given on the spider diag below.



Choose two of the techniques named. For each one,

(i) briefly explain how it increases yields;

(ii) state one disadvantage of its use.

Choice .....

Explanation .....

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Disadvantage .....

..... [3]

Choice .....

Explanation .....

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Disadvantage .....

..... [3]

(e) Another way of increasing farm yield is to use new seeds.

Sowing the seeds of change

In 1959 researchers in the Philippines cross-bred two rice plants: a semi-dwarf plant from China with a strong, tall Indonesian plant. The result was a sturdy short plant called IR8. How it compared with traditional varieties of rice plants is shown below.

Old plant			New plant
grows rapidly			shorter, stronger plant
tall plant, can fall over easily			can be planted close together, needs little space
needs to be planted far apart			needs fertiliser and pesticides
5 months growing season			4 months growing season
average yield 1.5 tonnes per ha			average yield 5.0 tonnes per ha

(i) Why was this method given the name ‘Green Revolution’?

..... [1]

(ii) From the information above, give two different reasons why use of the new seeds resulted in higher food output.

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..... [2]

(iii) State one reason why the new plants were less at risk from bad weather during the growing season than the old plants.

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..... [2]

(iv) After new seeds were introduced, the wealth gap between rich large farms a... small farms became wider. Explain why the introduction of new seeds favoured... farms with large areas of land.

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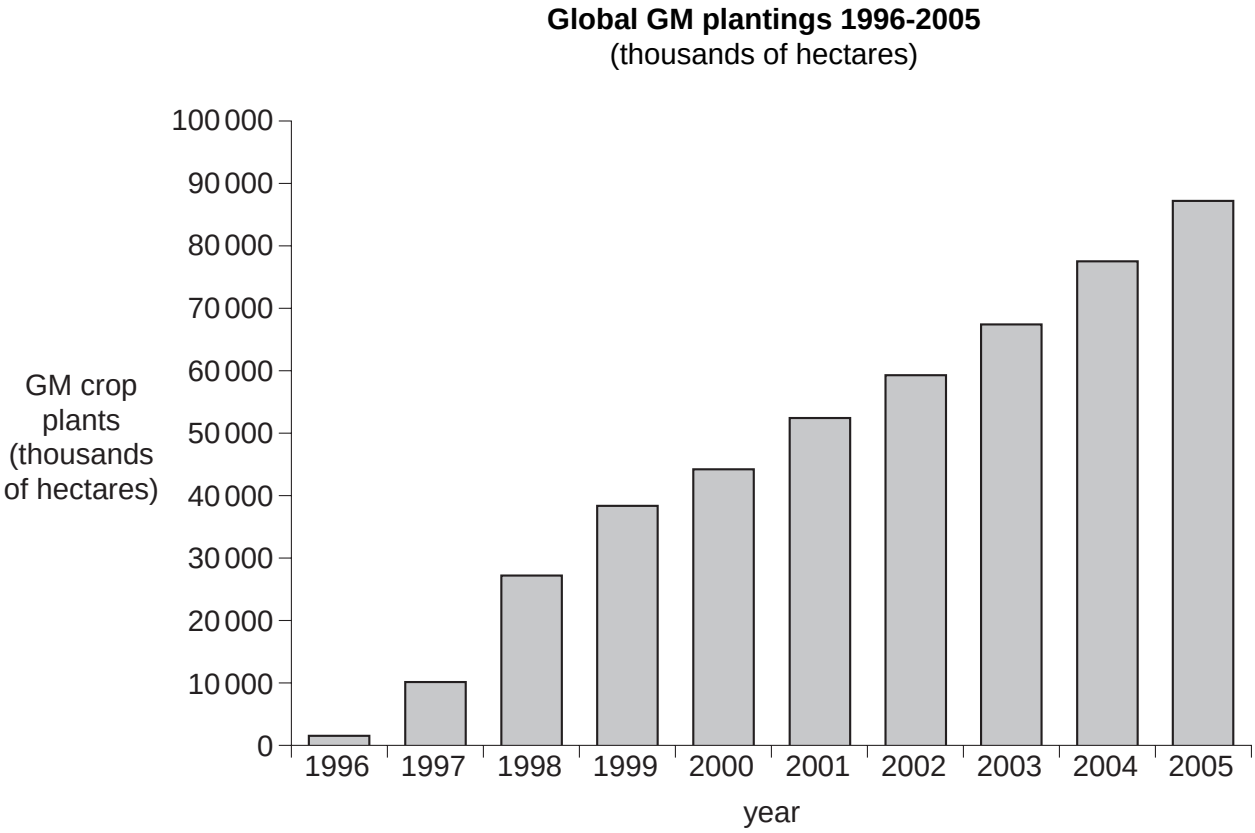
(f) About 30 years ago, research scientists started to develop GM (genetically modified) crops. The bar graph shows world total area planted with GM crops for the 10 years from 1996 to 2005.



(i) Describe what the graph shows about the growth in area planted with GM crops before and after 1999.

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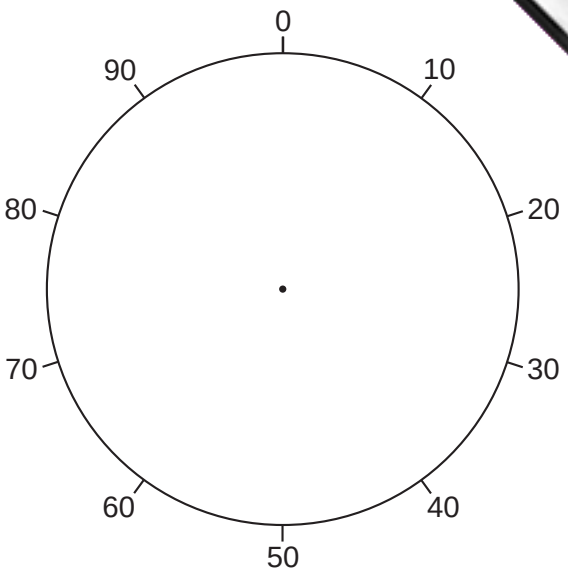
..... [2]

(ii) **Global GM plantings by country in 2005**

Percentages of global total area	
USA	55
Argentina	20
Brazil	10
Canada	7
China	4
16 other countries	4



Complete the pie graph. [3]

(iii) The largest GM seed producing companies are American. They were full of hope that their GM seeds would be used world-wide, in the same way as new seeds were during the Green Revolution of the 1960s.

By 2005 the use of GM crops had not been as widespread and successful as the companies had hoped. What evidence from the bar and pie graphs supports this statement?

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(g) **Comments about GM crops**

GM crops produce more food, more reliably. We have created corn with a natural pesticide; if an insect attacks the plant, the insect will die, not the plant. We have made a tomato that withstands frost.

GM research scientist

Public opinion in Europe is hostile to GM crops. It would be commercial suicide for our company to start selling foods made from GM crops. While there is no evidence that eating GM foods is harmful, many people are unwilling to take the risk.

Supermarket boss in Europe

We are worried about the introduction of 'unnatural' plants into the environment. The environment is a delicate system of checks and balances, easy to upset. Our fear is that GM crops will be harmful to surrounding plant and insect life.

Environmental group

As usual, the big GM companies are concentrating on rich countries. They are unwilling to sell seeds in poor countries, where their profits will be less. We have not seen any of the benefits so far and probably never will.

Politician in a poor African country

(i) State different reasons why fewer GM crops are grown in Europe and Africa than in the Americas (North and South).

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..... [2]

(ii) Would you expect there to be a great increase in the global area of GM plantings in the next 10 years?

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(iii) In your opinion, should there be a big increase in plantings of GM crops? State and explain your views about this.

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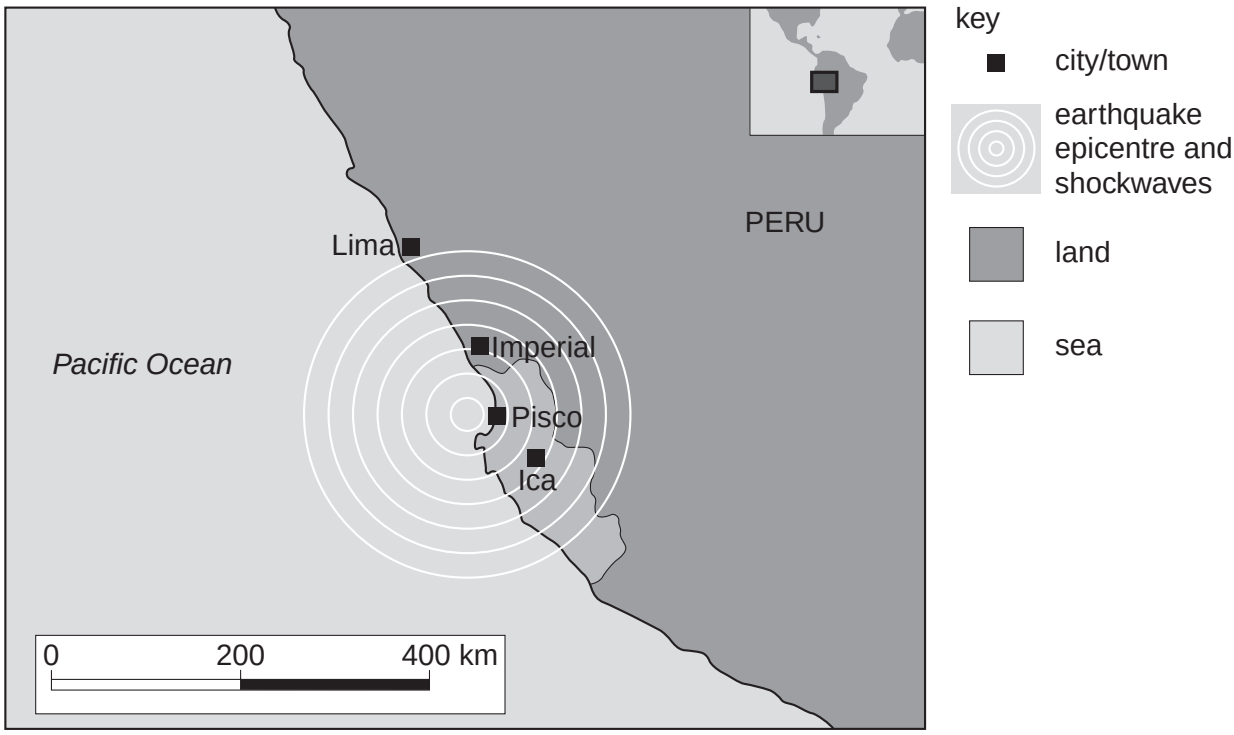
[4]

[Total: 40]

2 **Information about the earthquake in Peru (August 2007)**

On Wednesday 16th August 2007 at 18.41 local time, an undersea earthquake registering 7 on the Richter scale struck Peru's coastal province of Ica. The epicentre was about 150 km south east of Lima, the capital city.



Reports from coastal cities within the first 24 hours

Pisco – The first estimate was that 70% of the city was in ruins. Most houses had fallen – so also had churches and hotels. It was a city without lights, water and communications. Hundreds were trapped in buildings.

Imperial – The first estimate was that 80% of the adobe (mud) brick houses had fallen. Survivors lit fires in their ruined homes during the cold winter night.

Ica – People sifted through the rubble of the main church, which collapsed during a service when packed with worshippers.

Lima – People stood trembling in the streets as buildings shook around them.

The final death toll was estimated at between 450 and 500.

(a) State where the centre of the Peru earthquake was located in 2007.

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..... [1]

(b) **(i)** How far away from the centre were the effects of the earthquake felt?

..... [1]

(ii) Describe how the impacts of the earthquake varied with distance from the centre.

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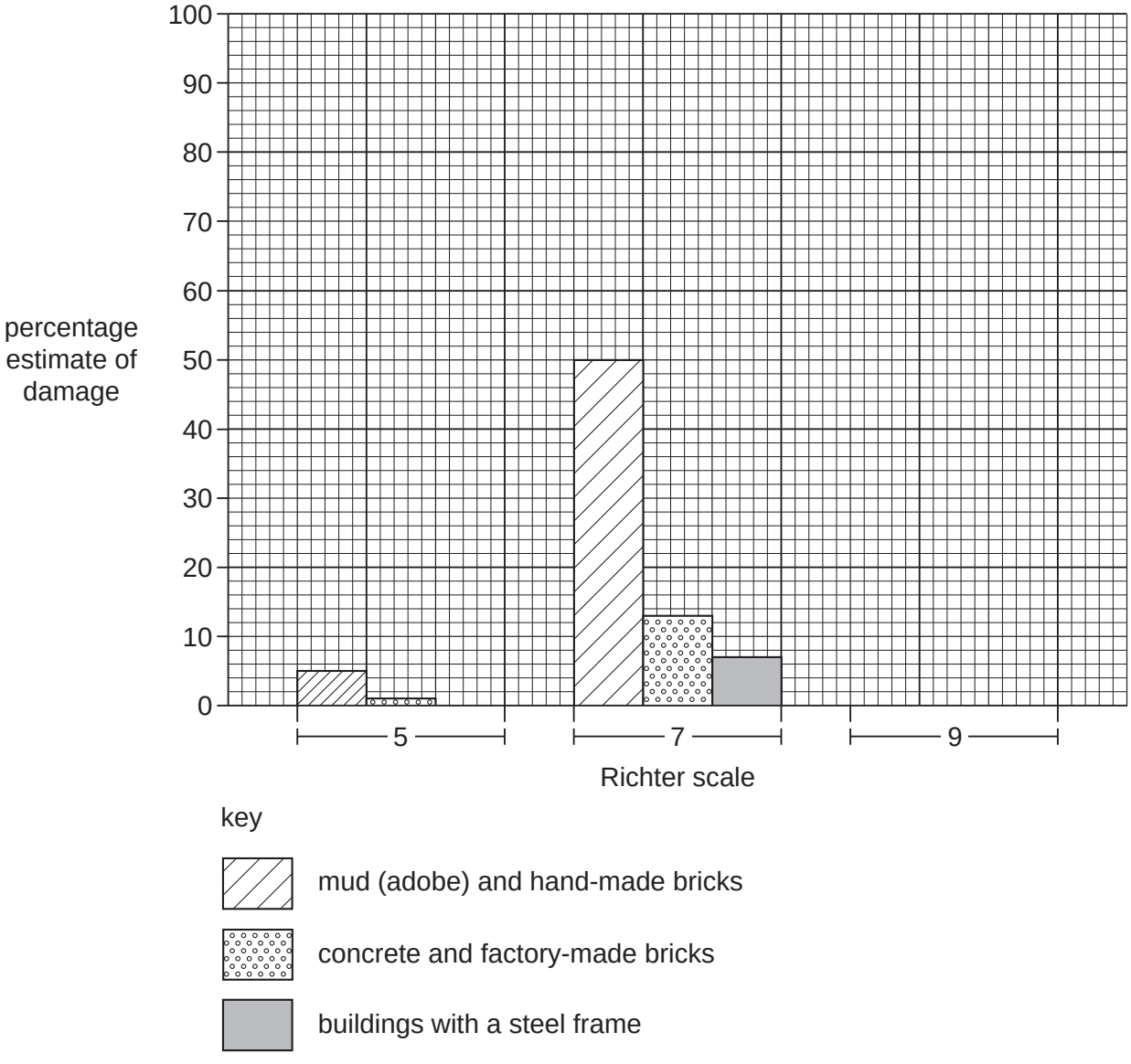
(c) The partly completed graph shows estimates for the percentage chance of dam buildings, according to types of building materials and earthquake strength.

Percentage estimates for damage to buildings in earthquakes



(i) Percentage estimates for an earthquake Richter scale 9

mud (adobe) and hand-made bricks	100
concrete and factory-made bricks	33
buildings with a steel frame	20

Complete the bar graph by showing percentages for a Richter scale 9 earthquake.

[2]

(ii) Describe what the graph shows about the percentage chance of damage to b according to increasing earthquake strength and types of building materials us

Increasing earthquake strength .....

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Types of building materials .....

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..... [3]

(iii) Was the damage to buildings in the Peru earthquake similar to that expected for an earthquake around 8.0 on the Richter scale? Explain as fully as you can from the information given.

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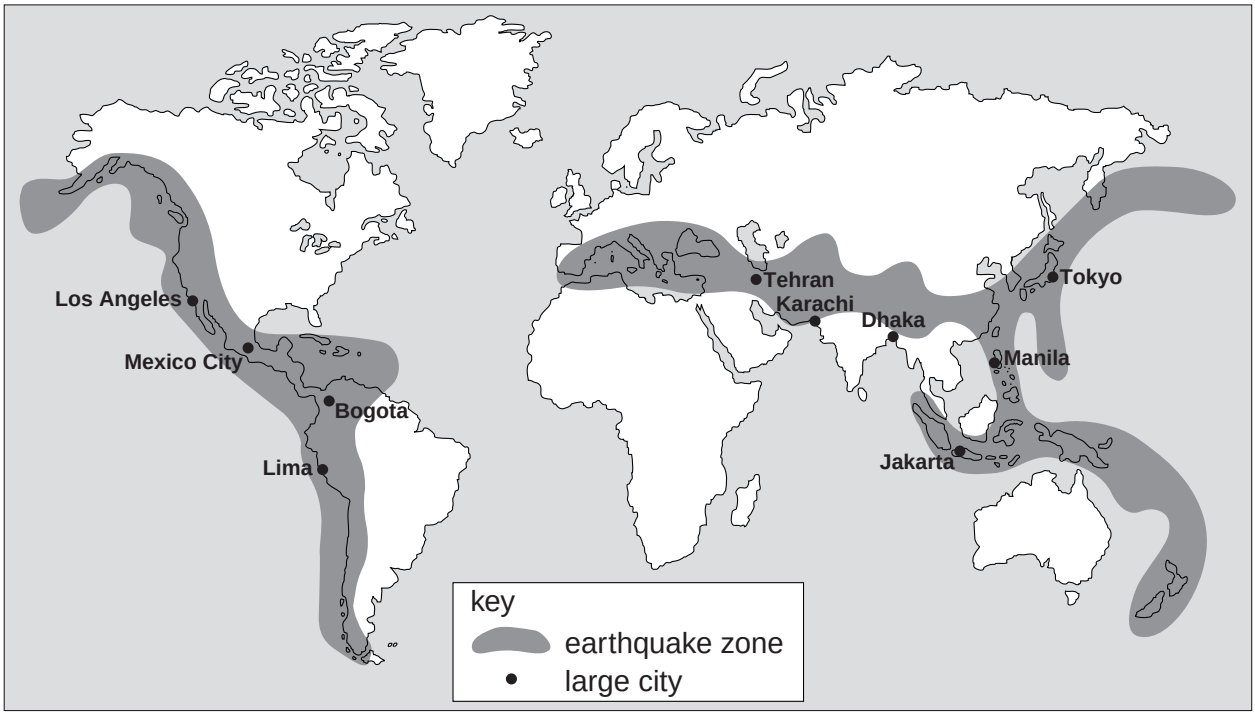
(d) Look at the world map of major earthquake zones. All ten cities named have mo... 7 million inhabitants.

Major earthquake zones



(i) Describe the main features of the world distribution and pattern of major earthquake zones shown on the map.

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(ii) Explain why earthquakes occur less frequently, or not at all, outside the major earthquake zones shown.

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(iii) Choose one country in which the earthquake risk is high. Explain why earthquakes occur regularly in that country.

Name of country .....

Explanation .....

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..... [4]

(e) The large cities named on the map make a big contribution to national wealth, for example Tehran contributes 40% of Iran's national income each year. One big earthquake could wreck the economy of Iran.

Tehran lies in such an earthquake-prone area that some have suggested moving the whole city of 12 million people to a safer location.

(i) Why is this unlikely to happen?

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(ii) Describe **three** strategies used in cities in developed countries, such as Tokyo and Los Angeles, to save lives when an earthquake strikes.

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[4]

(f) **Big cities and natural disasters**

UN Report 2007

* The number of natural disasters affecting urban populations has increased by four times since 1975

Causes identified

* World population growth
* Growth of big cities and densely packed urban areas
* Slums springing up in disaster-prone areas, such as on steep slopes, next to swamps
* Coastal locations of many big cities, with increasing risks from flooding and tsunamis

Main conclusion

* That the death toll from natural disasters affecting big cities does not have to keep increasing

(i) Big city growth is a much greater problem in developing than in developed countries. Why?

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..... [3]

(ii) Problems caused by natural disasters in coastal locations are similar in big cities in both developing and developed countries. Explain why.

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(iii) How likely is it that the death toll from natural disasters affecting large cities will stop increasing, as the UN says it should? State and explain your views about this.

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..... [4]

[Total: 40]

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