



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**5014/11**

Paper 1

**May/June 2011**

**2 hours 15 minutes**

Candidates answer on the Question Paper.

Additional Materials:     Ruler  
                                      Protractor

**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 **all** questions.  
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.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
<b>Total</b>	

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



Section A

- 1 (a) Look at the table, which gives information about very strong earthquakes in Indonesia since 1960.

years	number of very strong earthquakes	approximate number of deaths from earthquakes in Indonesia
1960 – 69	1	70
1970 – 79	0	5 000
1980 – 89	0	0
1990 – 99	1	2 500
2000 – 04	4	228 120
2004 – 09	9	12 100

(i) In which 20 year period were there no very strong earthquakes in Indonesia?  
.....[1]

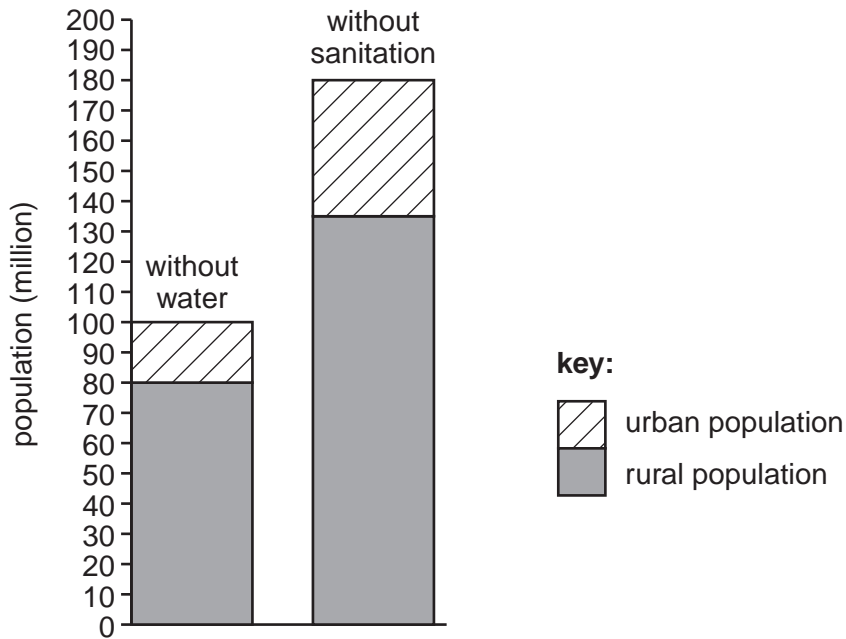
(ii) How did the number of very strong earthquakes in Indonesia change after 1999?  
.....[1]

(iii) Was there a relationship between the earthquake strength and the number of deaths in Indonesia between 1960 and 2009? Support your answer with evidence from the table above.  
.....  
.....  
.....  
.....[2]

(b) Indonesia lies along a destructive plate boundary. Describe how this explains the occurrence of earthquakes in Indonesia.  
.....  
.....  
.....  
.....  
.....  
.....[3]



- 2 (a) The bar graph shows the total numbers of people living in homes without water and without sanitation for both urban and rural areas of South East Asia.



- (i) What percentage of people without access to water in South East Asia live in rural areas?

..... % [1]

- (ii) Compare the total number of people living in homes without water with those without sanitation in South East Asia.

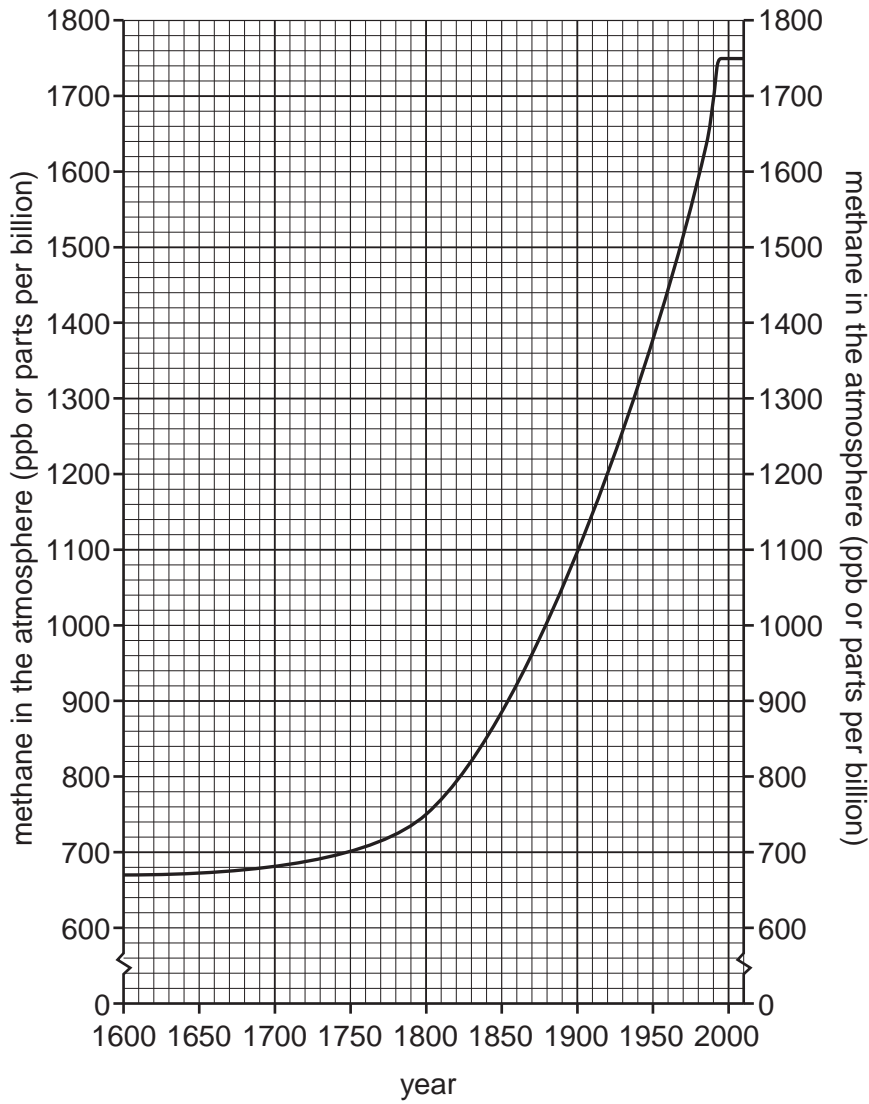
.....  
..... [1]

- (iii) Describe how access to water and sanitation in homes differs between urban and rural areas of South East Asia and suggest **one** reason for the difference.

difference .....  
.....  
reason .....  
..... [2]



3 (a) Look at the graph, which shows amounts of methane in the atmosphere since 1600.



(i) How much methane (ppb) did the atmosphere contain in 2010?

..... ppb [1]

(ii) Describe the main trends in the methane content of the atmosphere since 1600.

.....  
 .....  
 ..... [2]



- 4 (a) Describe the density of trees within the tropical rainforest and the characteristics of trees in the canopy layer.

density of trees .....

characteristics of trees .....

.....

.....

.....

.....

.....[4]

- (b) Look at the photograph of tropical rainforest in Panama.



- (i) What evidence suggests that subsistence cultivation is taking place in this area?

.....

.....

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.....[2]



(ii) Clearance has affected the vegetation in the foreground of the photograph. State two ways in which the vegetation which has re-grown differs from natural tropical rainforest.

1 .....

2 ..... [2]

(c) The government wants to stop clearance of the forest. Suggest reasons why subsistence cultivation should be allowed to continue.

.....

.....

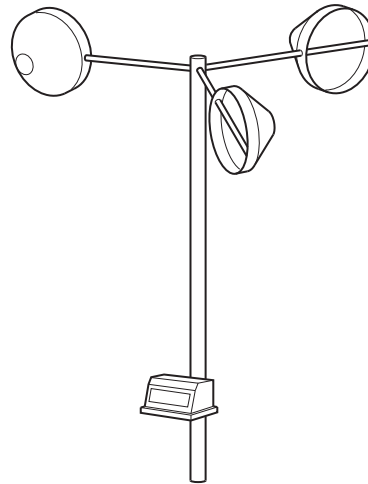
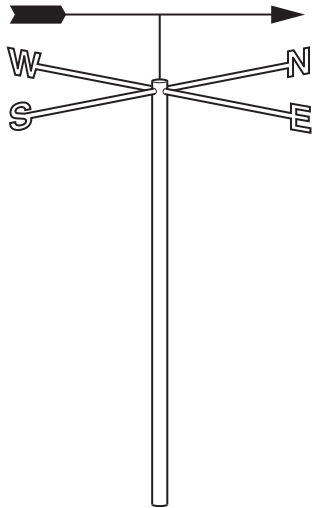
.....

..... [2]

Section B

5 (a) (i) In the spaces, name the two weather instruments and state what each one measures.

Instruments for measuring the weather



name ..... [2]

measures ..... [2]

(ii) What is similar about how the two instruments work and where they are sited?

work .....

.....

site .....

..... [3]

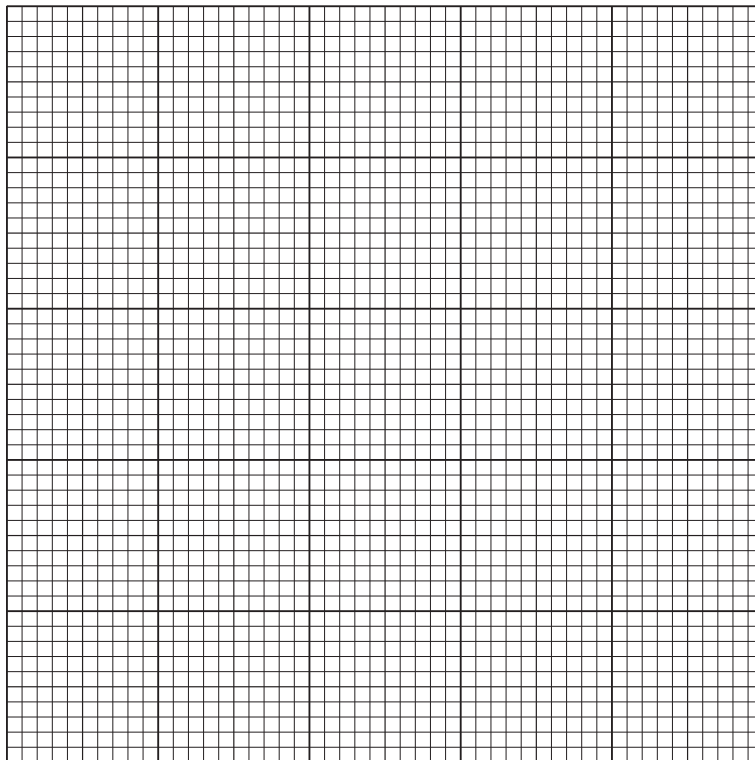
(b) Wind can be used as a power resource.

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Use

**Costs of electricity generation in the UK in 2005 by power sources**

power source	cost (US cents per kilowatt hour)
fossil fuels	5
nuclear	7
wind	8
wave and tidal	22
solar	72

(i) Draw a bar graph to show these values.



[4]

(ii) Looking at the graph, how likely is it that further use will be made of wind power to generate electricity in the UK in the future? Explain your view.

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..... [3]

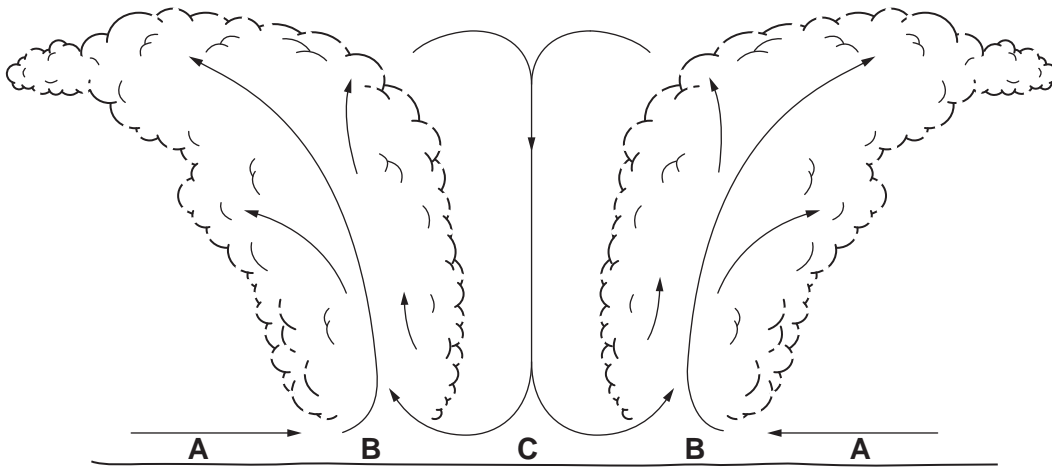
(iii) In other countries the cost of generating electricity from these sources may be different.

Suggest reasons for this.

.....  
.....  
.....  
.....[2]

(c) The strongest winds in the world occur in cyclones. Look at the section through a tropical cyclone.

Section through a tropical cyclone



(i) In which one of the locations labelled **A**, **B** and **C** on the section will the winds be strongest?

Explain your choice of location.

location .....

explanation .....

.....  
.....  
.....[3]

(ii) Where, when and why do cyclones form?

where .....

when .....

why .....

.....

.....

..... [4]

(iii) Describe how very strong winds in cyclones can cause loss of life and injuries to people.

.....

.....

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..... [2]

(iv) Cyclones which affect the Caribbean are called hurricanes. Look at the summary of the 2005 hurricane season in the Caribbean.

named storms	expected number per year	actual number in 2005	difference between expected and actual number in 2005	previous record number
total number at all strengths	10	26		21 (in 1933)
number at hurricane strength	6	14		12 (in 1969)
number at highest hurricane strength (category 5)	1	3		2

Complete the table by filling in the differences for the number in 2005 compared with the average number expected. [1]

(v) Describe what the table shows about the 2005 hurricane season in the Caribbean.

.....

.....

.....

..... [2]

- (d) Information about the effects of four of the hurricanes in the 2005 season is given below.

For  
Examiner's  
Use

**2005 Hurricane season in the Caribbean**

**Hurricane Katrina (USA)**

A direct hit on the city of New Orleans left 1321 people dead and thousands homeless; most were poorer people who did not have cars or the money to escape inland before Katrina arrived. Production from oil and gas fields in the Gulf of Mexico was disrupted. But the USA as a whole was little affected because the Gulf States contribute only 2 per cent to the total economy.

**Hurricane Rita (USA)**

Millions of Texans from large cities such as Houston got into their cars and tried to go north, further inland, to escape the threat of Hurricane Rita. They caused traffic jams more than 150km long.

**Hurricane Stan (El Salvador and Guatemala)**

Very heavy rains set off mudslides and avalanches, killing up to 1000 people as homes and villages were destroyed.

**Hurricane Wilma (Mexico)**

The country counted the cost in lost tourist dollars as thousands of visitors from overseas were driven home early when Wilma destroyed beaches and hotels.

- (i) Give examples of the human costs of the 2005 hurricane season using the headings social and economic.

social .....

.....

economic .....

..... [3]

- (ii) Describe how the evidence from the 2005 hurricane season shows that, as usual with climatic hazards, the poor (both people and countries) were more badly affected than the wealthy.

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..... [3]

**(iii)** How can the negative impact of climatic hazards be reduced? Describe strategies that can be used before the hazard happens.

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.....  
..... [4]

**(iv)** Is it ever going to be possible to stop people dying from the effects of climatic hazards?

Give your views on this and explain them as fully as you can.

.....  
.....  
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..... [4]

[Total: 40 marks]

6 (a) (i) Water is essential for life on Earth. Why?

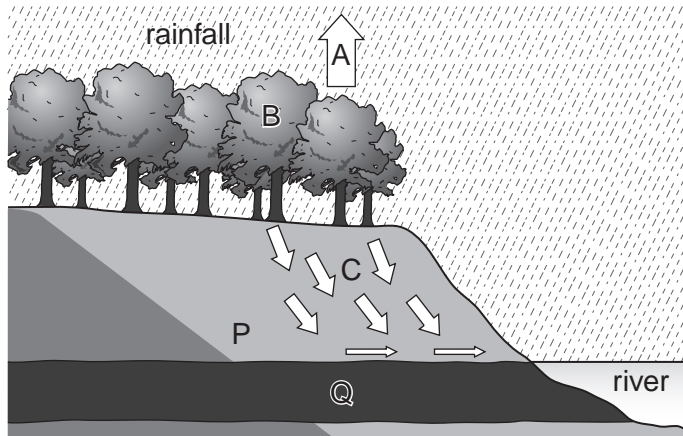
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..... [2]

(ii) Look at the diagram which shows part of the water cycle.



Name the water cycle processes at **A**, **B** and **C**.

**A** ..... **B** .....

**C** ..... [3]

(iii) Rock layers **P** and **Q** have different effects on water movement underground. How and why are they different?

.....

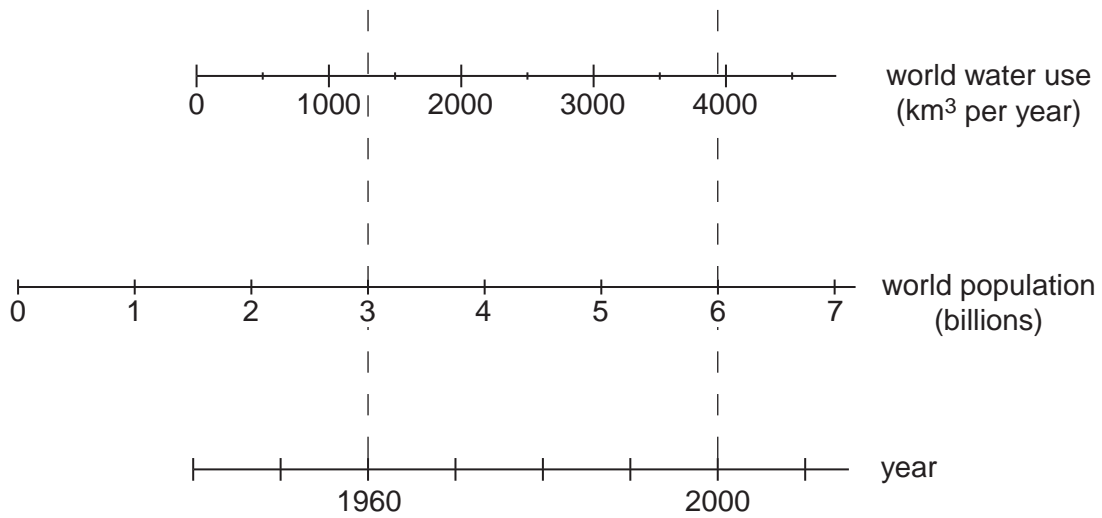
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..... [2]



(b) Look at the information on world population and water use.

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(i) By how many times did world population increase between 1960 and 2000?  
..... [1]

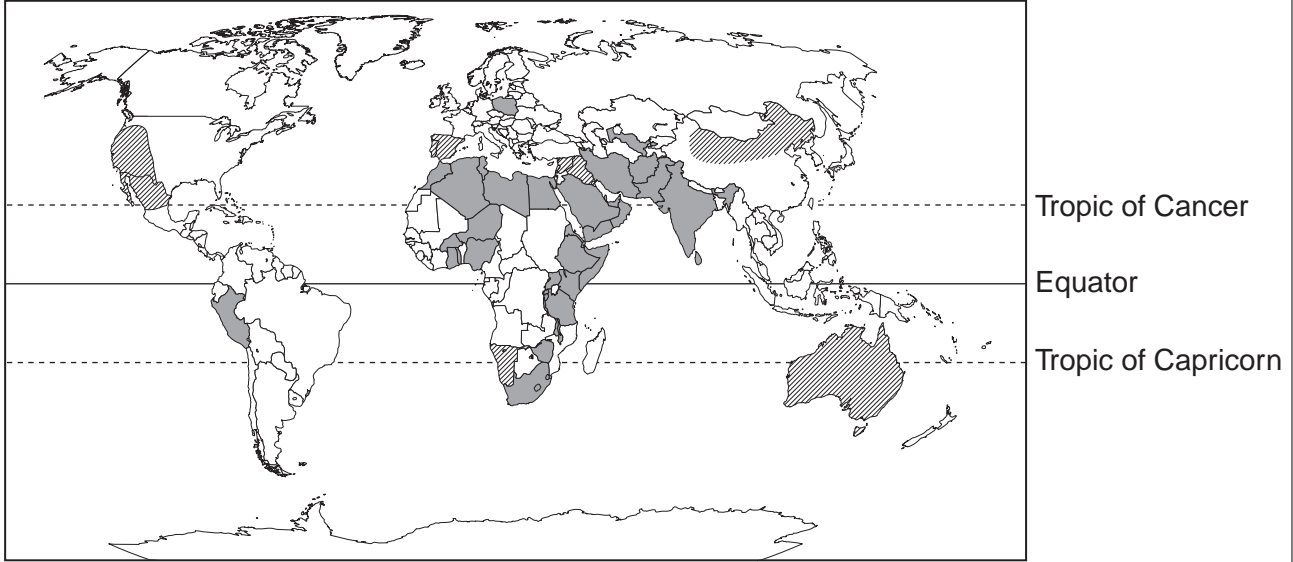
(ii) By how many times did world water use increase between the same dates?  
..... [1]

(iii) Why is it very likely that world water demand will increase even more between 2000 and 2025?  
.....  
.....  
.....  
.....  
..... [3]



(c) Look at the world map of water availability. It shows

- areas already at risk from severe water shortages
- countries expected to be at risk of severe water shortages by 2025, likely to be bad enough to restrict water use.

**Water shortages**



**key:**

-  areas in 2005 already at risk from severe water shortages
-  countries expected to be at risk from severe water shortages by 2025

Describe the distribution of areas and countries with water shortages (already and expected by 2025).

.....

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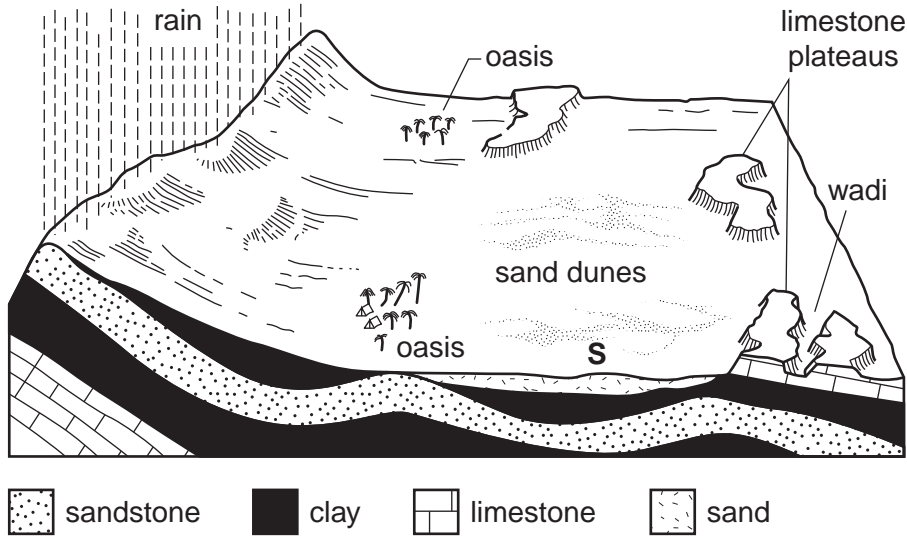
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..... [4]

- (d) Most places at risk from severe water shortages have climates which are dry for all or part of the year. One possible source of water for farmers in these areas is from underground stores.

Look at the section across part of the Sahara Desert.



- (i) On the diagram, shade or colour in the water-bearing layer of rock (the aquifer). [1]
- (ii) Give the source of the water and explain why the water is trapped to form an underground store.

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.....[3]

- (iii) Explain why oases (areas of cultivation and settlement) are located in the areas shown and not in other areas such as the one labelled **S**.

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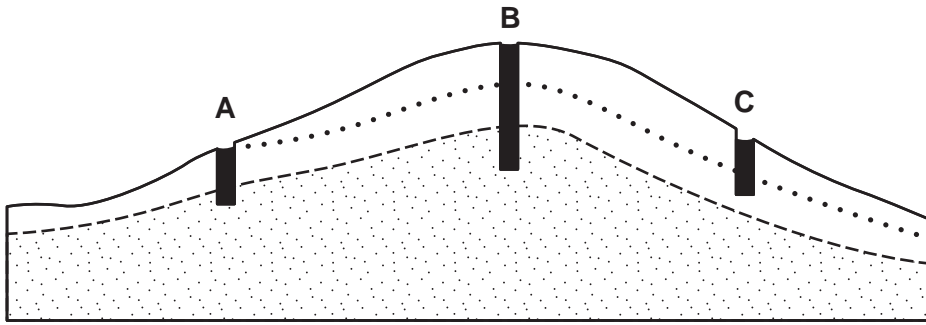
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.....

.....[3]

(iv) Some wells are better than others for reliability and low cost water supply. Look at the diagram showing three wells.


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Use



 well / borehole

..... present day wet season water level (water table)

--- present day dry season water level (water table)

 permanent water bearing rock

Which well is the best for water supply? Why is it better than the other two?

best well .....

why .....

.....

.....

.....

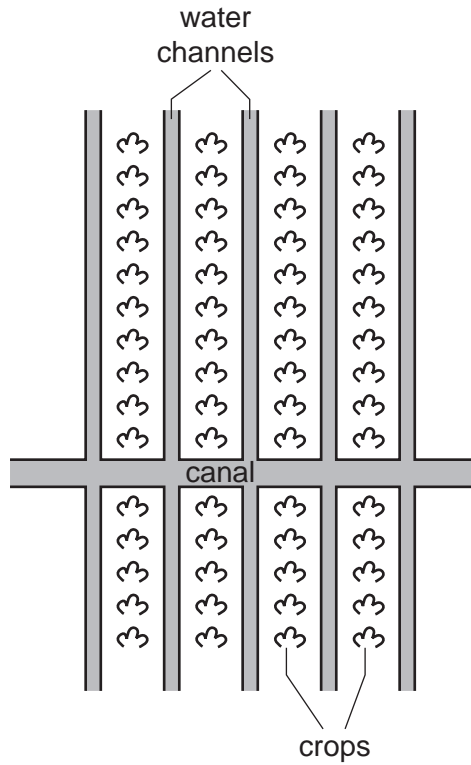
.....

..... [3]

- (e) Many environmentalists believe that there should be improved efficiency in water use for irrigation, before farmers look for new supplies of water.

For  
Examiner's  
Use

Look at the sketch showing channel (furrow) irrigation.



- (i) How is water lost and wasted when this method of irrigation is used?

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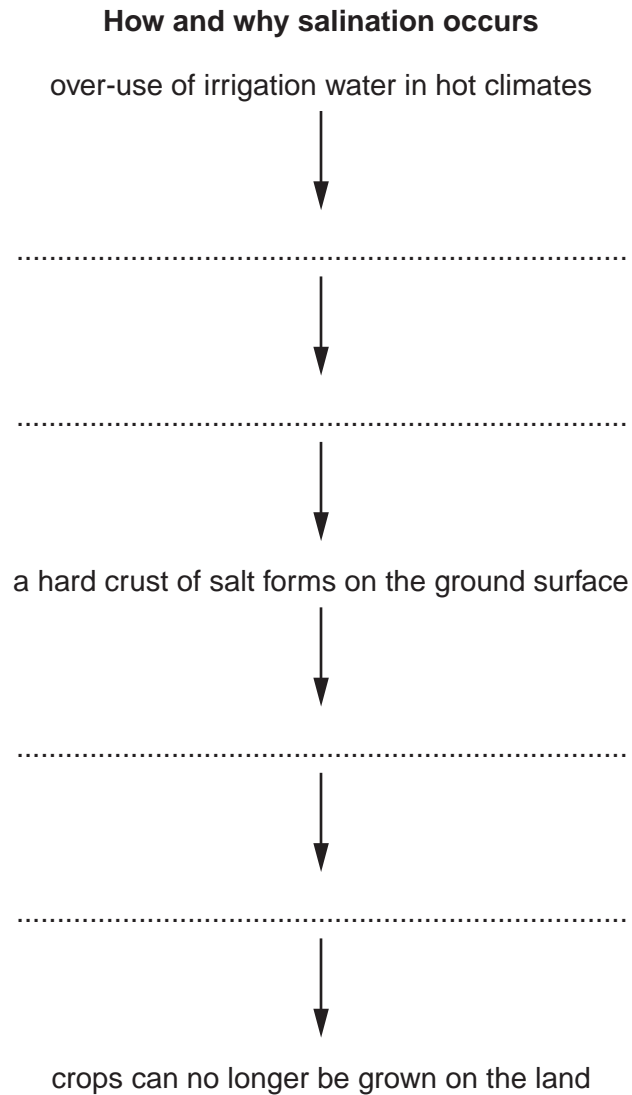
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.....[2]

- (ii) An environmental problem which often results from using this method of irrigation is salinisation.

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Below is a partly completed flow diagram to show how and why the problem of salinisation occurs.



Use the statements below to fill the four empty spaces and complete the flow diagram.

high concentrations of salt accumulate around crop roots

moisture in the soil is evaporated

most crops cannot tolerate high levels of salt

salts are drawn up to the top of the soil

[3]

- (iii) Draw a labelled diagram to show a different method of irrigation, which makes more efficient use of water than channel irrigation. Describe how it makes better use of the water available.

.....

.....

.....

.....

..... [4]

- (iv) Is salinisation more or less likely to occur with this method than with channel irrigation? Explain your answer.

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..... [2]

- (v) When supplies of irrigation water run out, what other farming methods can be used to make sure that crops can still be grown?

.....

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..... [3]

[Total: 40 marks]

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*Copyright Acknowledgements:*

Question 6d      © adaptation from: R B Bunnett; *Physical Geography in Diagrams*; Longman; 1976.

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