UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

2488948817

ENVIRONMENTAL MANAGEMENT **0680/41**

Alternative to Coursework **October/November 2011**

1 hour 30 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 **all** questions.
Study the appropriate Source materials before you start to write your answers.
Credit will be given for appropriate selection and use of data in your answers and for relevant interpretation of these data. Suggestions for data sources are given in some questions.
You may use the source data to draw diagrams and graphs or to do calculations to illustrate your answers.

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.

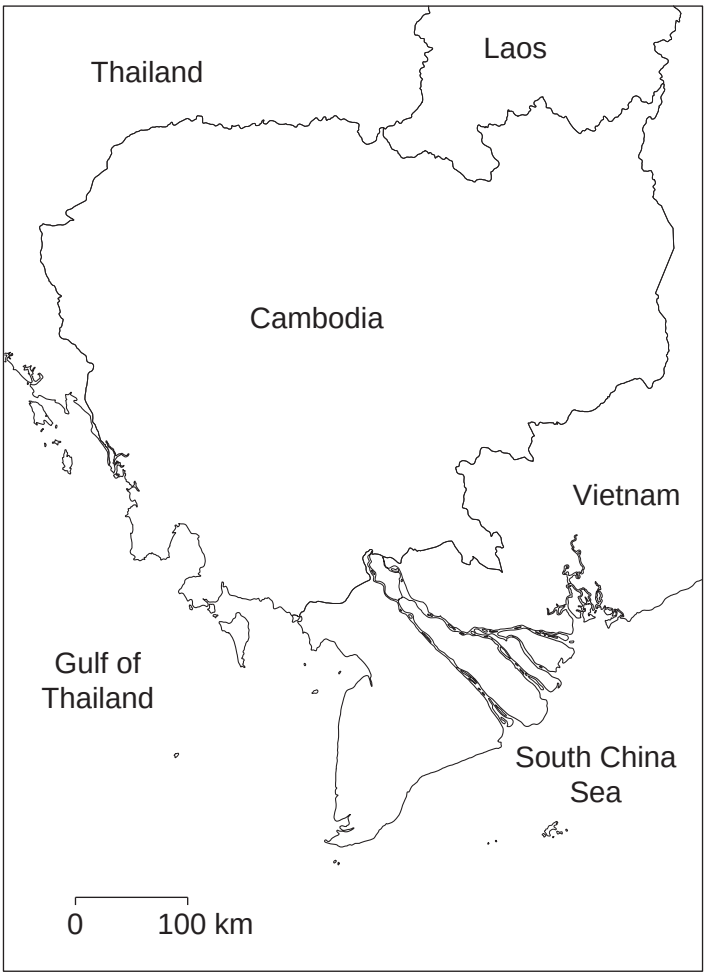
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Map of the World



Map of Cambodia

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Area of Cambodia: 181 515 sq km
Population: 15 000 000
Children per woman: 3.04
Life expectancy at birth: 62 years
Currency: reils (KHR) (4000 KHR = 1 US dollar)
Languages: Khmer, French, English
Climate: tropical, monsoon with wet season May to November, dry season from December to April
Terrain: mostly plains with mountains in the southwest and north
Main exports: clothing, footwear, timber, rubber, rice, fish, tobacco

The economy of Cambodia has grown since 2004 with the growth of clothing manufacture, agriculture and tourism. The clothing industry contributes about 85% of Cambodia's exports. Mining is expected to grow as deposits of bauxite, gold, gems and iron ore are being investigated. The major economic challenge for the next ten years will be creating enough jobs for the 50% of the population that is under 21 years old. There is widespread poverty in the countryside where subsistence agriculture is a way of life.

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[Turn over

1 Tonle Sap is one of the largest lakes in the world. During the wet season, water from the Mekong River fills the lake making it much larger. In the dry season it becomes much smaller and shallower.

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- Half of Cambodia's fish catch comes from Tonle Sap.
- The rice fields and surrounding forests are flooded each year.
- Fish spawn and grow in the flooded areas.

(a) (i) Rural people eat fish and rice every day and remain healthy.
How does eating fish and rice help to maintain human health?

fish .....

.....

rice .....

..... [2]

(ii) At the beginning of the wet season the farmers plant fast-growing varieties of rice that can grow up to 10 centimetres a day. Suggest reasons for this.

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..... [2]

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(iii) During the monsoon fish feed and grow in the rice paddies and in the surrounding flooded forest areas. At the end of the wet season water starts to drain away allowing fish to be caught in the canals connecting the rice paddies to the rivers. The farmers usually only catch enough fish to eat each day. Sometimes a small number of fish are taken to a local market.



The farmers have noticed that

- large fish are not caught as often as in the past
- one of the favourite fish species is now rarely caught
- fish catches are smaller.

A scientist asked six farmers from the rice paddies to record their fish catch each day for a week. They were asked to record the number and type of fish.

Draw, in the space below, a suitable table to record the catch for a week for each of the six farmers.

[3]

(iv) Why did the scientist ask more than one farmer to record their fish catches?

..... [1]

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(b) (i) Suggest **two** other measurements the scientist could have asked the farmers to record.

.....

..... [2]

(ii) What further research could the scientist do to see if the farmers' fish supplies are sustainable?

.....

.....

..... [2]

(c) Another scientist had data from a different survey of fish caught at three villages on the edge of the lake.

The results are shown in the table.

	village A	**village B**	**village C**
numbers of types of fish	8	6	5
large fish	many	some	few
small fish	few	some	many
hours spent fishing each day	2	3	3

(i) Which village is least likely to be overfishing?

..... [1]

(ii) Which village is most likely to be overfishing?

..... [1]

(iii) Suggest **two** reasons why a village might have a shortage of fish even though they have fished in the same way for hundreds of years.

.....

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..... [2]

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(d) The population of Cambodia has doubled in recent years and the demand for fish has increased greatly. To satisfy demand more people are fishing and some illegal methods such as electrofishing are used, a method that kills all the fish in a small area.

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Explain the likely consequences for the fish and other species in the ecosystem.

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..... [3]

(e) The giant Mekong catfish is an endemic species found nowhere else in the world. It has already become a critically endangered species on the IUCN red list (most at risk of extinction). This fish used to be caught in Tonle Sap. The government is trying to protect fish stocks in Tonle Sap.

(i) Suggest **two** ways the government could help to protect fish stocks.

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..... [2]

(ii) Is it helpful for conservation purposes for a species to be put on the IUCN red list? Explain your view.

.....

..... [2]

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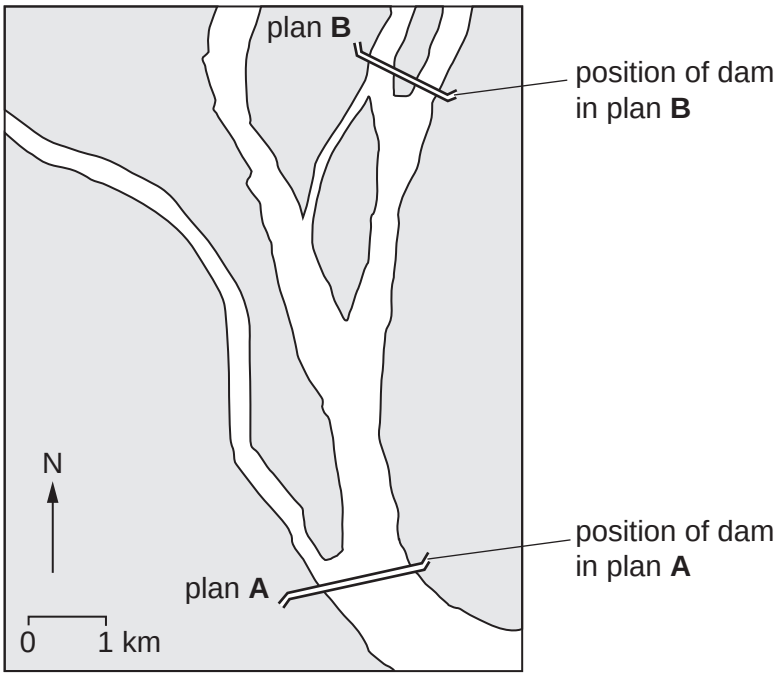
(f) The government plans to build several dams across the country's rivers. The dams will generate electricity and help to control the annual flooding downstream.

One person said, "I am in favour of building dams as we will have electricity for the first time."

Another person said, "I live below one of the proposed dams. I will not have to cope with flooding each year if the dam is built."

A third person said, "I am worried that my food supply will get worse. How can rice grow well without the annual flood? Where will I get my fish from?"

The government proposed two plans for a dam as shown in the diagram.



Details of the two plans are shown below.

	plan A	**plan B**
size of reservoir (sq km)	880	6
megawatts generated	3300	465

(i) What are the advantages of plan **B** to local people?

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..... [3]

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(ii) Suggest reasons why the government prefers plan **A**.

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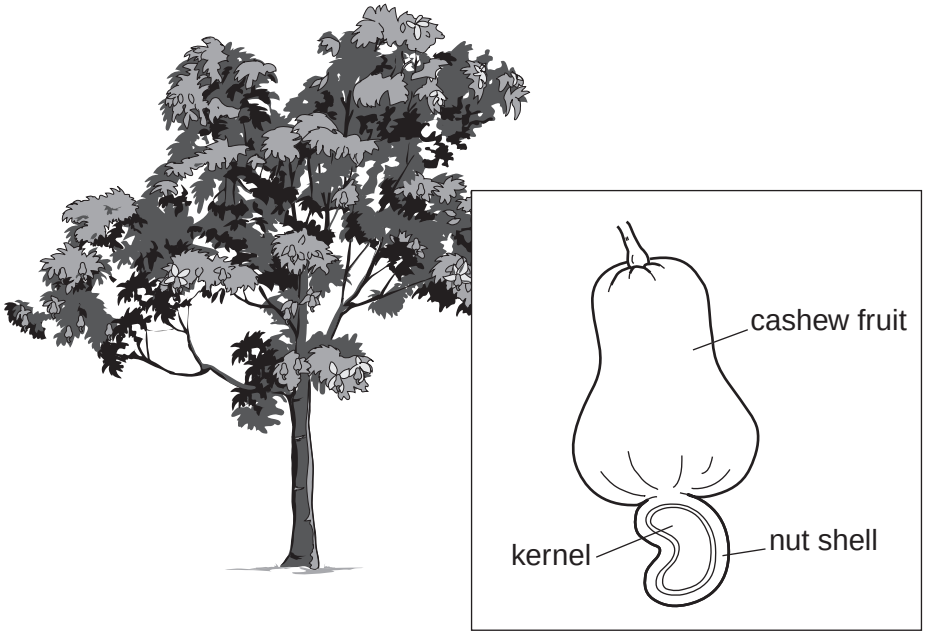
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..... [2]

2 Most of the people in Cambodia are subsistence farmers with only occasional surplus crops to sell. Some farmers are being helped to grow a new high value crop, cashew nuts.

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- Cashew fruits can be eaten.
- The cashew kernel can be sold for high prices.
- Oil can be extracted from the shell surrounding the kernel.
- An extract of the shell can be used as an insecticide.
- The gum of the bark can be used as an insect repellent.
- The plant has other medicinal uses.

The cashew trees need a deep, rich soil. The trees can be planted in orchards or as individual trees on the edge of fields. To produce the best crop the trees should be widely spaced.

The output from three small farms is shown in the table.

	farm A	**farm B**	**farm C**
number of trees	20	15	18
total fresh weight of fruits (kg)	240	165	234

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(a) (i) Work out which farms produce the most and least fruits per tree. Show your working.

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most .....

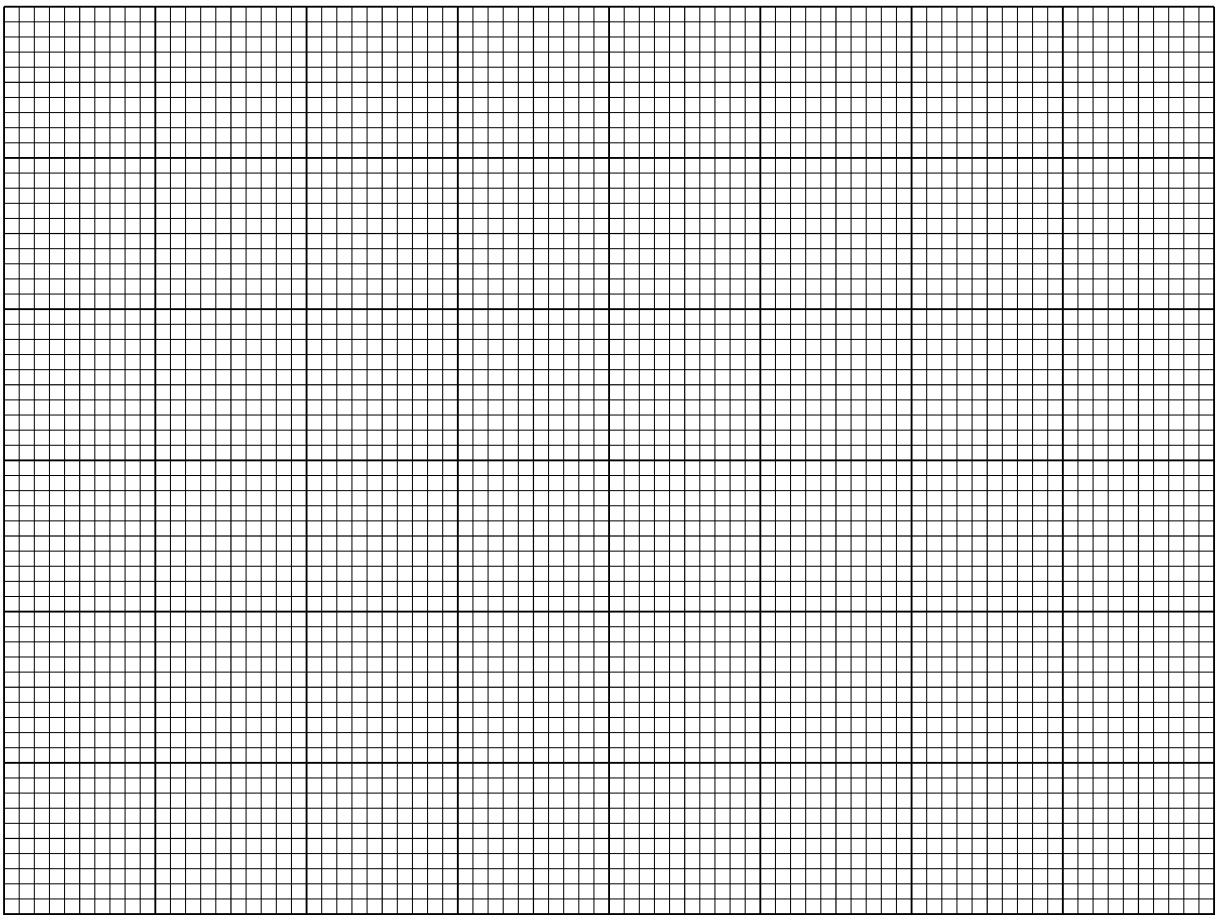
least ..... [3]

(ii) A cashew tree takes several years before it produces its maximum yield of fruits. The harvest from one small orchard of ten trees was recorded for several years. The results are shown in the table.

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year	average weight of fruits per tree (kg)
2003	0
2004	0
2005	5
2006	12
2007	16
2008	21
2009	20
2010	21

Plot the data on a suitable graph. [4]



(iii) In which year did the trees reach maturity?

..... [1]

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(iv) The cashew fruits were sold for 1.25 US$ per kg in the local market in 2010. Calculate the total value of the crop in 2010.

.....

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..... [2]

(b) The rural population is exposed to several diseases including malaria.

(i) What type of climate is likely to favour the spread of malaria?

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..... [2]

(ii) Explain why malaria cannot be eliminated from Cambodia.

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..... [3]

(iii) Suggest how farmers can protect themselves from catching malaria.

.....

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..... [2]

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[Turn over

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3 (a) (i) The government is trying to create more jobs, especially for the increasing number of young people. Ecotourists are encouraged to visit Cambodia's National Parks and Protected Forests. The table shows climate data for Cambodia.

month	highest temperature (°C)	rainfall (mm)	number of wet days	discomfort from heat and humidity
January	34	15	2	high
February	36	3	1	high
March	38	13	2	high
April	40	43	4	extreme
May	39	221	16	extreme
June	38	330	21	extreme
July	37	315	23	extreme
August	36	269	21	extreme
September	35	335	21	extreme
October	35	269	20	high
November	35	114	11	high
December	35	56	7	high

Using information from the table, suggest when the main season for tourism in Cambodia takes place.

..... [1]

(ii) Suggest **three** different jobs that could result from the growth of ecotourism.

.....

.....

..... [2]

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(b) (i) An official from a National Park wanted to find out if people living in the park wished to encourage ecotourism. The official decided to write a questionnaire for villagers in the villages in the National park to answer.

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Complete the questionnaire with three further questions.

Q1 How long have you lived in the National Park?

☐ less than a year ☐ 1–2 years ☐ 3–5 years ☐ more than 5 years

Q2 How do you earn your living?

☐ farming only ☐ farming and collecting wild plants

☐ other ☐ work outside the National Park

Q3 .....

.....

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Q4 .....

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Q5 .....

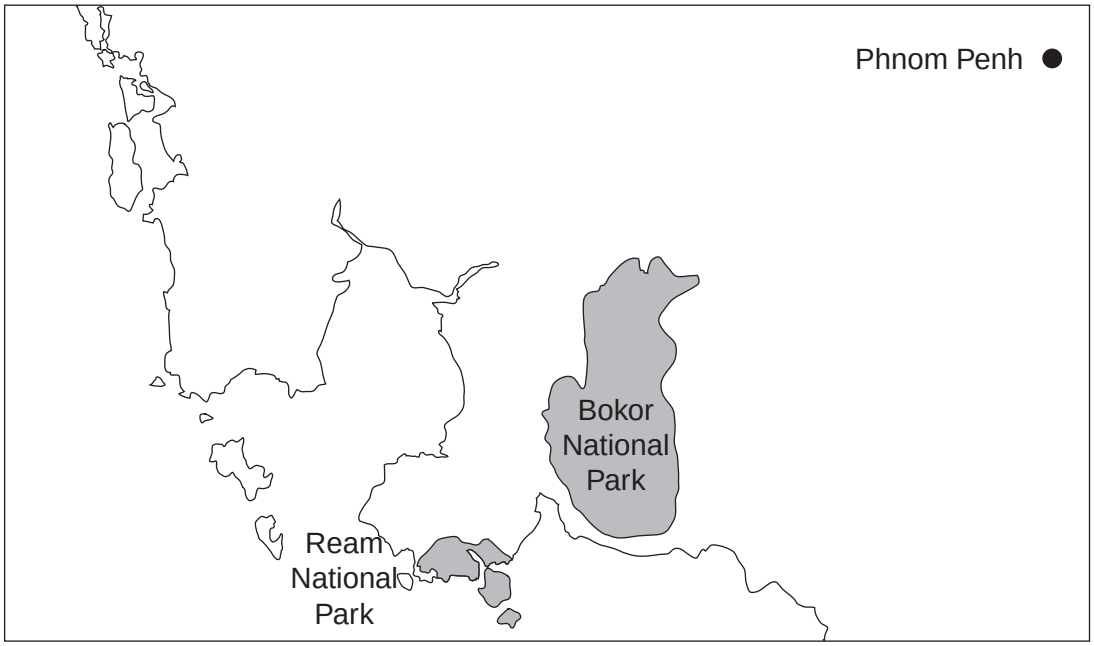
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(ii) The Bokor National park is 1580 km^2 of protected forest, mostly primary forest rich in plants and endangered animals such as the tiger. Nearby is the Ream National Park with a coastline of beautiful beaches.

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Ecotourism allows tourists to see areas of great biodiversity. However, any kind of tourism can damage the environment because of the needs for transport, goods and services.

The area shown in the diagram is going to be further developed for ecotourism by 2020. Some developments will be allowed and others restricted or banned. Describe the developments you would allow and those you would restrict or ban.

allowed developments .....

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restricted or banned developments .....

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..... [8]

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