



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

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CENTRE  
NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**0680/43**

Paper 4

**October/November 2018**

**1 hour 30 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 **all** 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.

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.

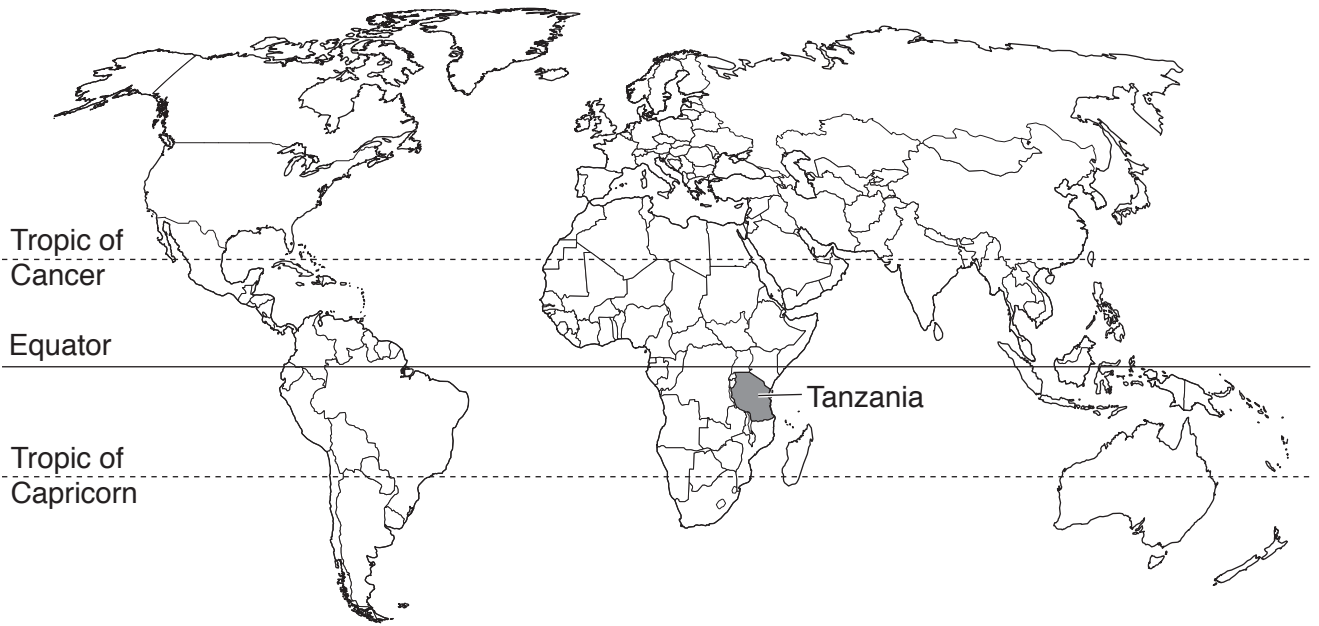
You may use the source data to draw diagrams and graphs or to do calculations to illustrate your answers.

At the end of the examination, fasten all your work securely together.

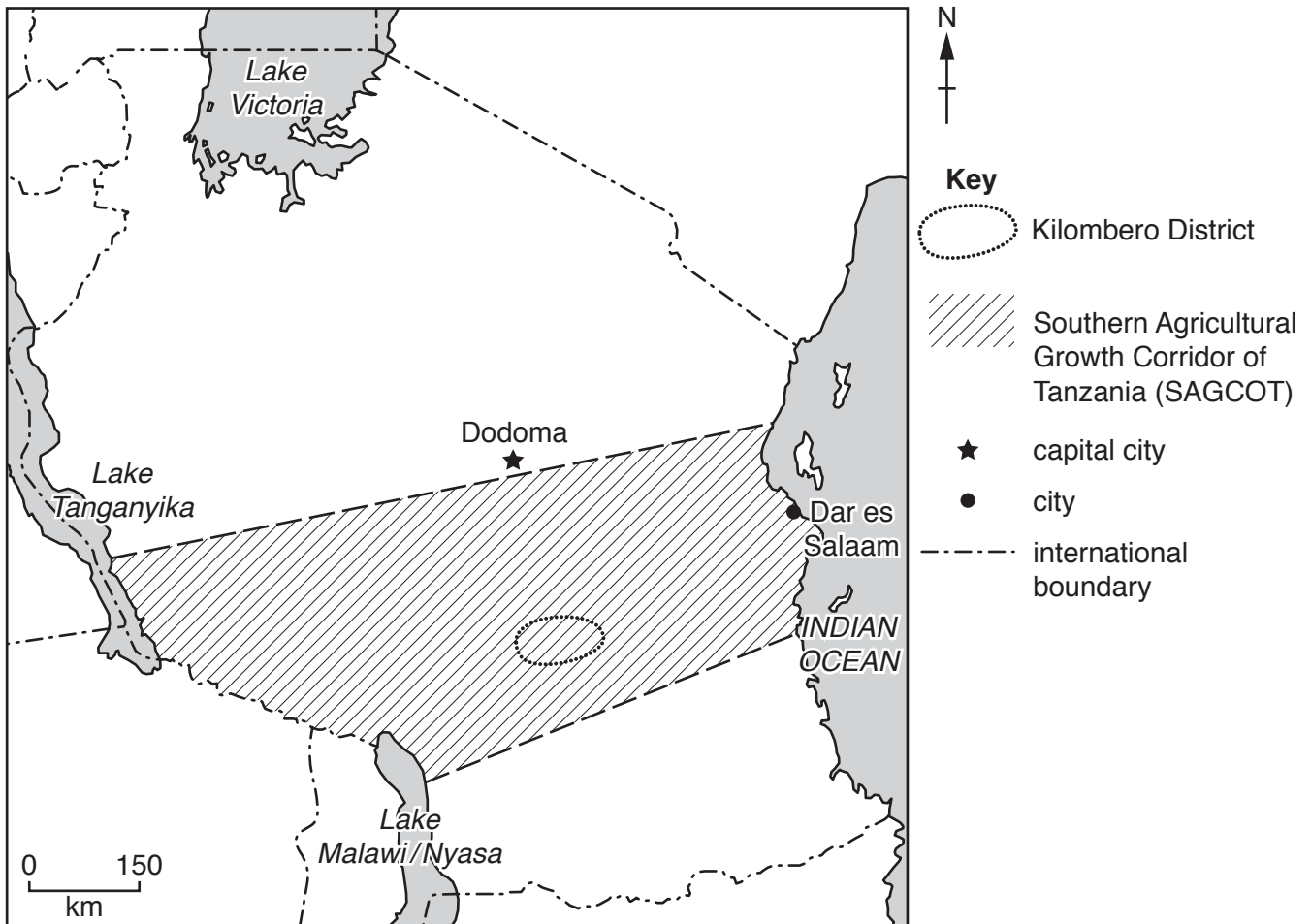
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **13** printed pages and **3** blank pages.

map of the world



## map of Tanzania



**area:** 947 300 km<sup>2</sup>

**population:** 56 million (in 2016)

**children per woman:** 4.89

**life expectancy:** 61 years

**currency:** Tanzanian Shilling (2150 TZS = 1 USD)

**languages:** Swahili, English

**climate:** tropical, cooler in the highlands

**terrain:** coastal plain, central plateau, highlands in the south and north

**main exports:** gold, coffee, cashew nuts, cotton, other manufactured goods

1 All the land in Tanzania is owned by the government. The government leases land for up to 99 years. The economy depends on agriculture, which employs 80% of the work force and produces 85% of exports and 25% of GDP. Most people work as farm labourers or lease small farms. The demand for agricultural products is increasing worldwide. The government has set up the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) to increase the sustainable production of crops. This includes management of the environment.

(a) Suggest reasons why the government wants to increase crop production.

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

(b) Over the next 25 years the SAGCOT strategies aim to increase food production by more than two million tonnes per year.

**SAGCOT strategies**

- 1. to increase crop production
- 2. to reduce waste and pollution
- 3. to increase farm profitability
- 4. to conserve natural resources

(i) Soil is a natural resource. Describe how trees help to protect the soil.

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

(ii) Suggest why improving farm profitability is important for farmers.

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

(iii) Suggest how crop production could be increased without damaging the environment.

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

(c) The Kilombero District is a wetland area in Tanzania.

Look at the map of Tanzania **on page 3**.

Measure the distance in kilometres between the Kilombero District and Dar es Salaam.

..... km [1]

(d) A scientist wanted to find out how productive the wetland areas in southern Tanzania were before any changes were made by SAGCOT strategies. The scientist used this method.

- Identify all the districts with wetland areas in southern Tanzania.
- Identify villages near these wetland areas.
- Select 20 of these villages.
- Select 30 households from each village.
- Interview the head of each household using a questionnaire.

(i) Calculate the total number of households sampled.

..... [1]

(ii) Explain why a large number of households were sampled.

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

(iii) Suggest a method for selecting 30 households from a village of 75 households.

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

- (e) One of the questions in the questionnaire was about income from natural resources gathered in the wetland area. The findings are shown in the table.

natural resource gathered from wetland area	average household income for each natural resource / TZS per year
fruits	1800
medicinal plants	15 900
wooden poles	6800
grasses	23 400
firewood	3700
total	.....

- (i) Complete the table. [1]

- (ii) Calculate the percentage of average household income that is provided by medicinal plants.

Space for working.

.....% [2]

- (iii) Suggest a use for each of the following natural resources.

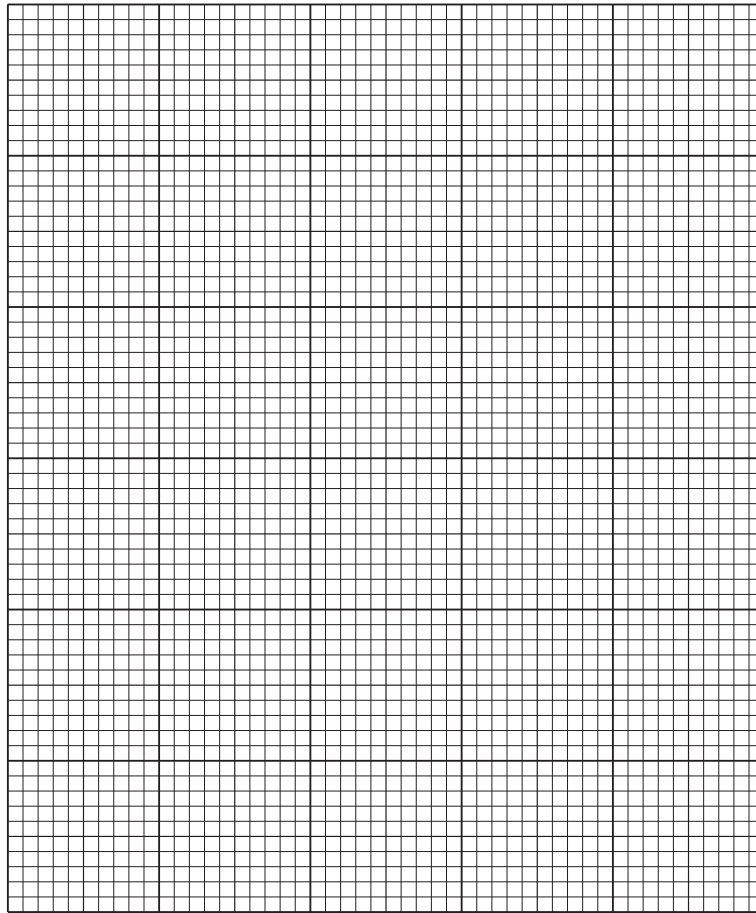
fruits .....

medicinal plants .....

grasses .....

[3]

(iv) Draw a bar graph to show the average household income from each natural resource.



[4]

(f) Medicinal plants have local names. The scientist paid the villagers for samples of each type of medicinal plant. The samples were carefully packed and sent to a botanical garden for scientific identification.

(i) Suggest why the scientist paid the villagers for the medicinal plants.

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

(ii) Suggest advantages to the scientist of knowing the scientific names of the medicinal plants.

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

(g) A student wanted to find out more about the types of medicinal plants collected by the villagers. The student proposed two plans that could be used to estimate the number of medicinal plants collected each day.

**plan one**

Ask 10 villagers how many medicinal plants they collected in one day. Record this information in a notebook.

**plan two**

Ask 10 villagers how many of each type of medicinal plant they collected in one day. Repeat this on two more days. Record the results in a notebook.

(i) Explain why **plan two** is better than **plan one**.

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

(ii) The student took photographs of the plants collected each day. Suggest an advantage of taking photographs of the plants collected.

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



(iii) The student's notebook shows the information collected from **plan two**. This information is not complete.

day one
10 different species
Total 32 plants

day
7 species
18 plants in total

day three
27
different species 8

Draw and complete a table to show the information from the pages of the student's notebook.

[4]

(iv) Which part of **plan two** did the student **not** record?

.....

.....[1]

(v) Suggest **one** other piece of information the student could have collected.

.....

.....[1]



(iii) Explain why you decided to locate the road and bridge in the position you have drawn on the map.

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

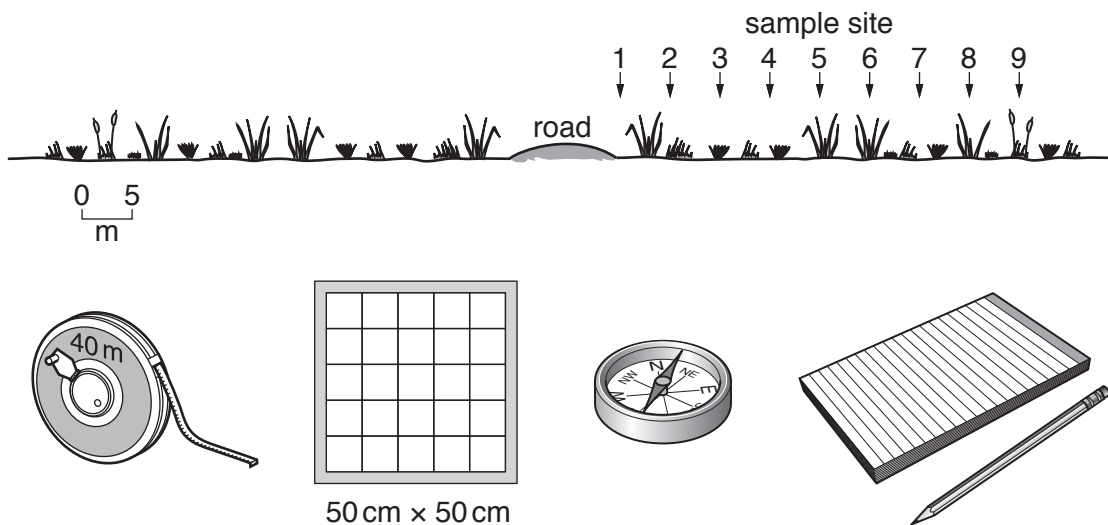
(iv) The road builders were given instructions to reduce damage to the local environment. Complete the instructions. The first instruction has been done for you.

Instructions to road builders to reduce damage to the local environment:

1. Do not spill oil.
2. Do not .....
3. Do not .....
4. Do not .....

[3]

- (b) A student carried out a survey of the plants growing over a distance of 40 metres from one side of a road.



The results are shown in the table.

<b>sample point</b>	1	2	3	4	5	6	7	8	9
<b>distance from road/m</b>	0	5	10	15	20	25	30	35	40
<b>number of plant species</b>	2	4	4	6	7	8	7	8	7
<b>total number of plants</b>	6	10	16	9	18	24	25	25	24

- (i) Describe the change in the number of plant species between 0 and 40 metres distance from the road.

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

- (ii) Which result for the total number of plants did the student think was an unexpected result? Suggest a possible reason for this result.

result at sample point number .....

reason .....

[2]

(iii) Describe how the student used the equipment shown in the diagram to collect the results in the table.

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

(iv) The student concluded that the road had an effect on plant biodiversity.  
Using information from the table explain why the student came to this conclusion.

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

(v) Another student said, 'You do not have enough results to support your conclusion that the road has an effect on plant biodiversity.'

Suggest **two** ways the student could have improved their survey.

1 .....

2 .....

..... [2]





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