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ENVIRONMENTAL MANAGEMENT **0680/23**

Paper 2 Management in Context **May/June 2021**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

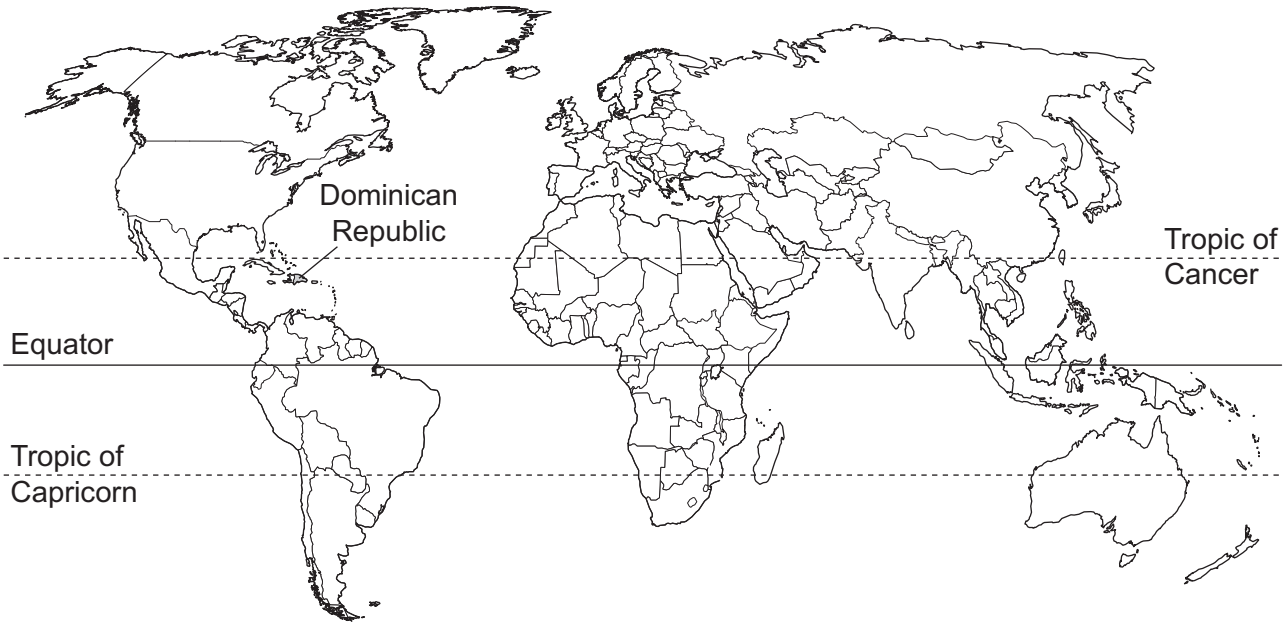
- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

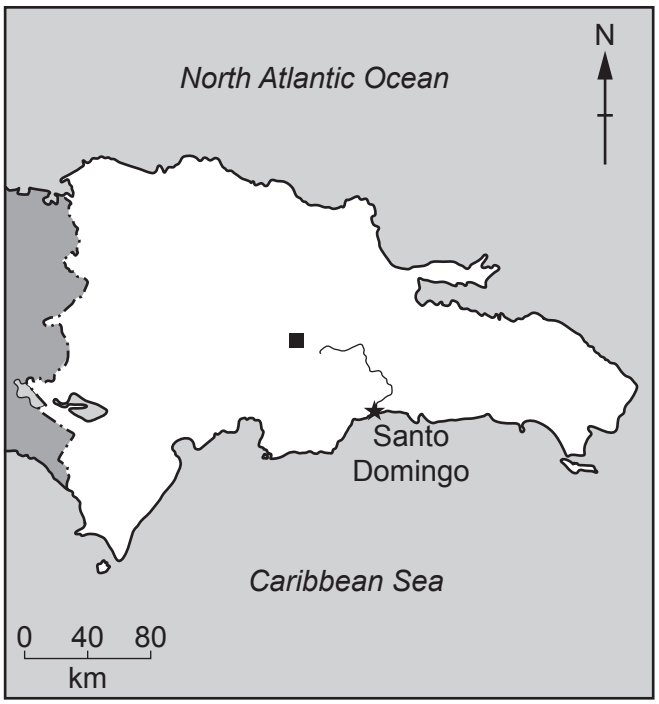
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[Turn over

world map showing the location of the Dominican Republic



map of the Dominican Republic



Key

- international boundary
- ★ capital city
- Ozama River
- ■ gold mine

Area of the Dominican Republic: 48 670 km^2

Population: 11.0 million (in 2019)

Children per woman: 2.28

Life expectancy: 71.3 years

Currency: Dominican peso (51 DOP = 1 USD)

Language: Spanish

Climate of the Dominican Republic: tropical along the coast, cooler and wetter in the mountains, rainy season May to November

Terrain of the Dominican Republic: highlands and mountains with fertile valleys

Main economic activities of the Dominican Republic: gold and copper mining, consumer goods, agricultural production including bananas, coffee and sugar

The Dominican Republic is a less economically developed country (LEDC). 83% of the population live in urban areas. The economic wealth of the country is increasing; however, unemployment remains a problem.

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[Turn over

1 (a) (i) Calculate the number of people living in urban areas in 2019.

..... [1]

(ii) Suggest reasons why people want to live in urban areas.

.....

.....

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..... [3]

(b) The Dominican Republic has several different climatic regions. The tables show climate data for two locations, **A** and **B**.

The table for location **B** is **not** complete.

location **A**

month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
average temperature / °C	16.2	16.7	17.5	18.3	19.1	19.5	19.5	19.8	19.7	19.2	18.1	16.9
average rainfall / mm	45	34	35	79	194	121	74	93	128	119	79	61

average temperature range = 3.6 °C **average annual rainfall =** 1062 mm

location **B**

month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
average temperature / °C	25.1	25.2	26.0	26.7	27.4	28.0	28.9	28.9	28.5	27.9	26.7	25.0
average rainfall / mm	13	15	30	34	86	26	26	52	79	80	49	19

average temperature range = ... °C **average annual rainfall =** ..... mm

(i) Complete the table for location **B**. [2]

(ii) Compare the climate at location **A** and at location **B**.

Use information from the tables to support your answer.

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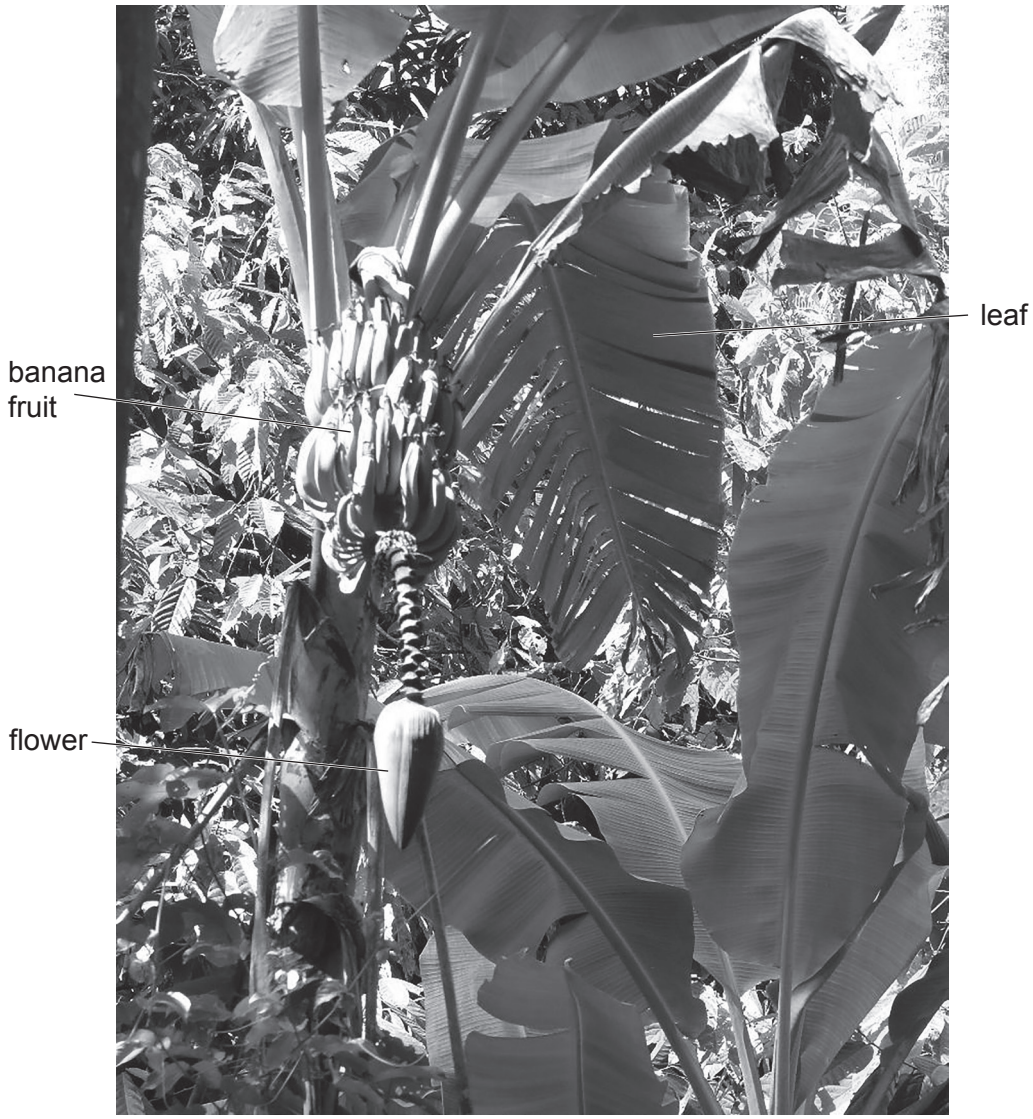
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..... [4]

(c) Location **B** is suitable for growing banana plants.

The photograph shows a banana plant.



(i) Suggest why the climate at location **B** allows banana plants to grow quickly and produce fruit.

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.....

..... [2]

(ii) Banana plants have very large leaves.

Explain how this helps the plants to grow quickly.

.....

.....

.....

..... [2]

(d) Bananas are an important cash crop.

(i) Define the term *cash crop*.

.....

..... [1]

(ii) Suggest **one** advantage and **one** disadvantage to farmers of producing cash crops. Give a reason for each answer.

advantage .....

.....

disadvantage .....

.....

[2]

(e) Banana plants are grown at two-metre intervals in rows that are three metres apart.

Other crops are planted between the rows of banana plants.

(i) Explain how planting more than one crop helps to reduce soil erosion.

.....

.....

.....

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.....

..... [3]

(ii) Suggest **one** benefit to a farmer, other than reducing soil erosion, of planting more than one crop.

.....

..... [1]

(f) The photograph shows bunches of bananas ready to leave a farm at location **B**.



A student wants to find out about the size of the bananas for sale.

The student collects five bananas from one bunch ready to leave the farm.

(i) Describe a method the student can use to select the five bananas at random.

.....

..... [1]

(ii) The student measures the mass of the skin and the mass of the edible fruit of five bananas separately. The table shows the results.

Complete the table to show the total mass.

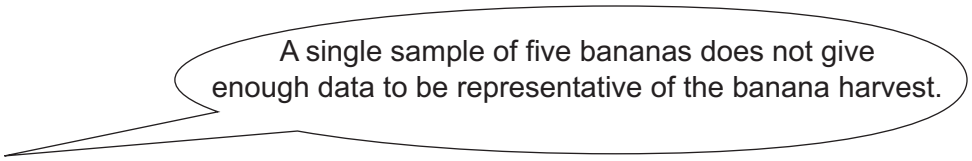
	mass for five bananas / g
edible fruit	282
skin	113
total	.....

[1]

(iii) Calculate the percentage of edible fruit in this sample of five bananas.

..... % [1]

(iv) A second student says:



Suggest improvements the first student can make to collect representative data from the banana harvest on this farm.

.....

.....

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.....

..... [3]

(g) A questionnaire is used to find out more about banana production on 25 small farms. The results are shown in the table.

	% response	
question	**yes**	**no**
Do you use insecticides?	28	72
Do you use fertilisers?	24	76
Do you make a profit each year?	80	20

(i) Describe what the results of this questionnaire show.

.....

.....

.....

..... [2]

(ii) The Cavendish variety of banana plant is easily infected by a disease called 'bacterial wilt'. This disease kills the plant before it produces fruit.

Scientists are using genetic modification to develop a new variety of banana plant that is resistant to this disease.

Describe how scientists can use genetic modification to produce a disease-resistant variety of banana plant.

.....

.....

.....

..... [2]

(h) The government has introduced a new programme to support farming in the Dominican Republic. This programme aims to increase the number of different crops grown by farmers.

Suggest ways this programme can benefit farmers and the government of the Dominican Republic.

benefits to farmers

.....

.....

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benefits to the government

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[4]

[Total: 35]

2 The Dominican Republic has one of the world's largest surface gold mines. The drawing shows part of this surface mine.



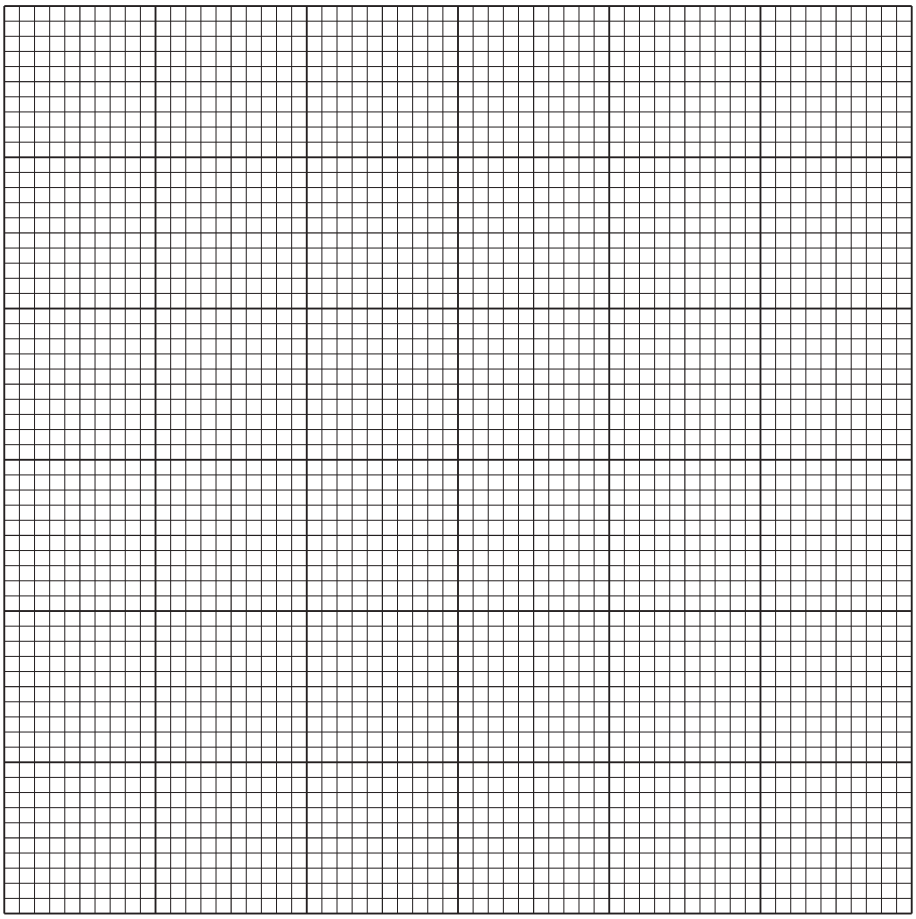
In 2018, the government was asked to give a licence for the first subsurface (underground) gold mine in the Dominican Republic.

The subsurface mine is expected to work for seven years. The cost of developing this mine is expected to be paid back in three years.

(a) The world gold price between 2012 and 2019 is shown in the table.

year	2012	2013	2014	2015	2016	2017	2018	2019
world gold price /1000 USD per kg	50	53	38	38	34	36	40	40

(i) On the grid, plot a graph of world gold price against year.



[4]

(ii) Suggest why the mining company thinks that the cost of developing the subsurface mine can be paid back in three years.

Use the data to support your answer.

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..... [2]

(b) (i) Suggest reasons why a subsurface mine is expected to cause **less** damage to the environment than the surface mine shown in the drawing.

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..... [3]

(ii) Suggest **two** benefits of the proposed subsurface mine to local people.

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.....

..... [2]

(iii) A mining licence is only given if the mining company agrees to be responsible for the site for several years after the mine has closed.

Suggest reasons why.

.....

.....

.....

..... [2]

[Total: 13]

3 Many tourists visit the capital city, Santo Domingo, every year. They also visit the beaches near this city.

(a) (i) Suggest **two** economic benefits of tourists visiting Santo Domingo.

1 .....

.....

2 .....

.....
[2]

(ii) Suggest the environmental impacts of large numbers of tourists visiting a city such as Santo Domingo.

.....

.....

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.....

.....

..... [3]

(b) The Ozama River flows through the middle of Santo Domingo into the sea. People living near this river are at risk of flooding every year.

The table shows the average monthly rainfall for Santo Domingo.

month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
average rainfall / mm	67	55	54	85	231	201	189	189	191	201	112	72

(i) State the months when people living near the river are at **least** risk of flooding. Give a reason for your answer.

months .....

reason .....
[2]

(ii) State **two** risks to people living near the river **after** a flooding event.

1 .....

.....

2 .....

.....

[2]

(iii) Santo Domingo was hit by Hurricane Irma, a tropical cyclone, in 2017.

Describe the formation of a tropical cyclone.

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..... [3]

(iv) Describe strategies to manage the impacts of a tropical cyclone.

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..... [4]

(c) A city official said:

> After a tropical cyclone, the beaches are polluted with plastic waste from the city. We must send many workers to clean the beaches. This takes several days.



Suggest why these beaches are cleaned.

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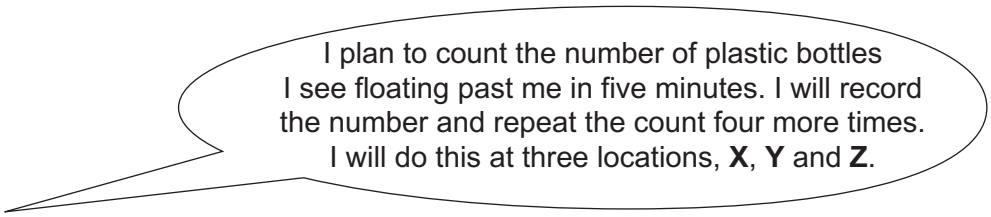
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..... [2]

(d) The Ozama River is polluted with plastic waste.

A student plans to find out about plastic waste entering the Ozama River.



(i) Draw a table that the student can use to record the data.

[3]

(ii) Suggest **two** pieces of information that the student **cannot** record about the plastic waste in the Ozama River.

1 .....

2 .....

[2]

(iii) The student also investigates the different types of plastic waste at the nearest beach to the capital city.

The student:

- collects samples of plastic waste in large boxes
- sorts the contents of each box into different types of plastic waste
- counts the number of each type of plastic waste in each box
- takes an average number per box.

The student's results are shown in the table.

type of plastic waste	average number per box
bottles	12
sheets	9
containers	17
toothbrushes	5
fishing nets	6

Suggest which type of plastic waste is **least** likely to have come from the city. Give a reason for your answer.

type .....

reason .....
[1]

(iv) Suggest ways the student can improve this beach investigation.

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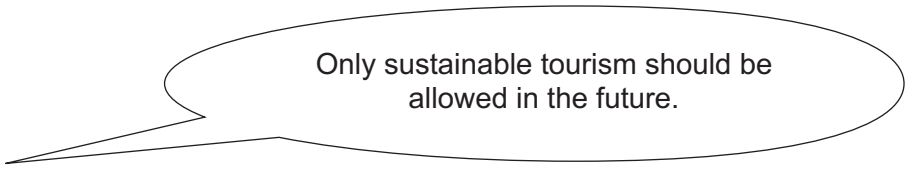
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..... [3]

(v) The student says:



Explain the advantages and disadvantages of developing sustainable tourism.

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..... [5]

[Total: 32]

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