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ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **February/March 2022**

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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world map showing the location of Guinea



map of Guinea

Key

★ capital city

river

international boundary



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Area of Guinea: 245 858 km^2

Population of Guinea: 12.7 million (in 2020)

Children per woman: 4.93

Life expectancy: 61.6 years

Currency: Guinean franc (1 USD = 9840 GNF)

Languages: French, local languages

Climate of Guinea: tropical climate, warm to hot all year round, rainy season May to October

Terrain of Guinea: generally flat coastal plain, hilly to mountainous interior, forested regions in the south east

Main economic activities: agricultural production, fishing, mining (bauxite, iron, diamonds and gold)

The Republic of Guinea is a less economically developed country (LEDC) with a high population growth rate. Guinea has a youthful age structure, with 60% of the population under the age of 25. Guinea has the world's largest deposits of bauxite. The government is developing agricultural production and the rural economy, but unemployment remains high.

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[Turn over

1 (a) (i) Calculate the number of people in Guinea that are under the age of 25.

..... [1]

(ii) Suggest reasons why 60% of the population in Guinea is under the age of 25.

.....

.....

.....

..... [2]

(iii) Suggest **two** impacts of a youthful age structure on a less economically developed country (LEDC).

1 .....

.....

2 .....

.....
[2]

(iv) The photograph shows a young person transporting goods in Guinea.



Describe **three** pieces of evidence in the photograph that suggest Guinea is a less economically developed country (LEDC).

1 .....

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2 .....

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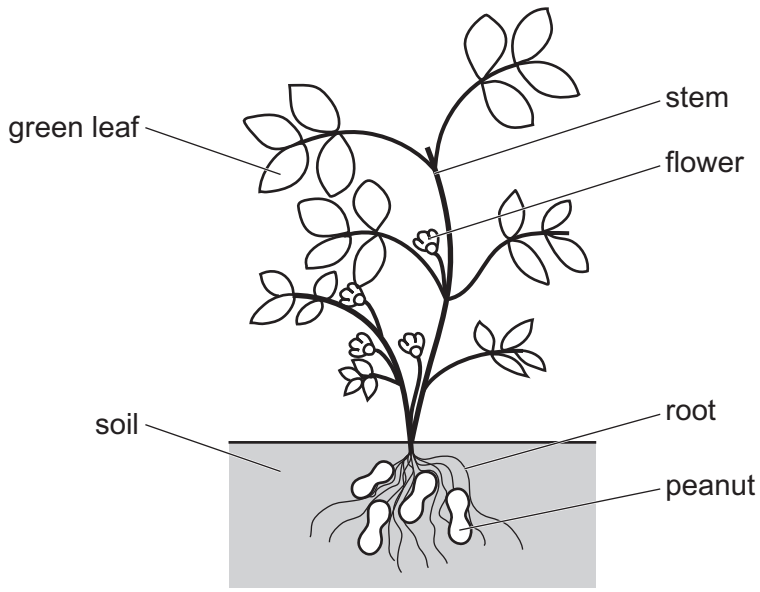
3 .....

.....

[3]

(b) Peanuts are an important cash crop grown by many farmers in Guinea.

The drawing shows a peanut plant.



(i) The green leaves of the peanut plants are used in the process of photosynthesis.

Describe the process of photosynthesis.

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..... [4]

(ii) The flowers of peanut plants are self-pollinating. This means that insects do **not** have to visit every flower for pollination to occur.

Describe the process of pollination in peanut flowers.

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..... [3]

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(c) Oil is extracted from peanuts.

The peanut oil is exported to many countries.

(i) Suggest **one** benefit of exporting peanut oil instead of peanuts.

.....

..... [1]

(ii) Suggest **two** possible uses for the peanut waste after the peanut oil has been extracted.

1 .....

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2 .....

.....

[2]

(iii) Suggest reasons why the government of Guinea encourages farmers to grow peanuts.

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..... [2]

(d) Peanuts need an average minimum temperature of 24 °C and an annual rainfall of at least 700 mm to grow well.

The table shows some climate data for one year at a weather station in a peanut-growing region of Guinea.

month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
temperature / °C	24	27	29	29	28	26	25	25	25	26	26	25
rainfall / mm	0	1	6	34	84	147	246	304	228	95	7	1

(i) Calculate the total annual rainfall.

..... mm [1]

(ii) Explain why farmers in this region can grow peanuts.

.....

.....

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..... [2]

(iii) Suggest why peanut plants in this region grow more slowly in January than in any other month.

.....

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..... [2]

(iv) Explain why farmers in this region expect soil erosion to occur in August.

.....

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..... [2]

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(e) The farmers use the same fields to grow peanuts each year.

(i) Suggest why the farmers expect the yield of peanuts to go down after several years.

.....

.....

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..... [2]

(ii) The stems and leaves of the peanut plants can be used to feed livestock.

Suggest how this helps make peanut farming a sustainable activity.

.....

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..... [2]

(iii) Some peanut farmers are **not** able to keep livestock.

Suggest other ways these farmers can make their farming sustainable.

.....

.....

.....

..... [2]

[Total: 33]

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2 A student talks to a peanut farmer.

The farmer says:

> I have two fields of peanuts, field A and field B. I usually harvest more peanuts from field A. I think the harvest from field B is being reduced by insect pests on the leaves and on the soil.

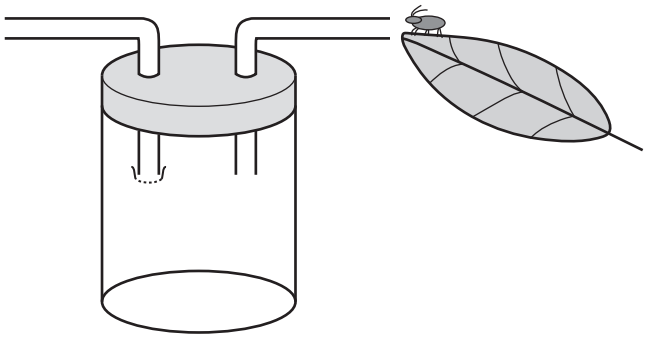
The student decides to investigate how many insect pests there are in each field.

(a) First, the student investigates the insect pests on the leaves of the peanut plants.

The student:

- selects 10 peanut plants at random in field A
- uses a pooter to collect insects
- collects insects from the top five leaves of each plant
- records the results in a table
- repeats the method in field B.

(i) The diagram shows a pooter.



Describe how the pooter shown in the diagram is used to collect insects.
You can add labels to the diagram to help your answer.

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..... [3]

(ii) Describe a method the student can use to select the peanut plants at random from each field.

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..... [2]

(iii) The table shows the results of the student's leaf investigation.

plant number	number of insects on five leaves	
	field A	field B
1	4	6
2	3	8
3	7	10
4	8	9
5	3	7
6	6	5
7	10	13
8	3	9
9	2	8
10	4	5
total	50	80
average	5	8

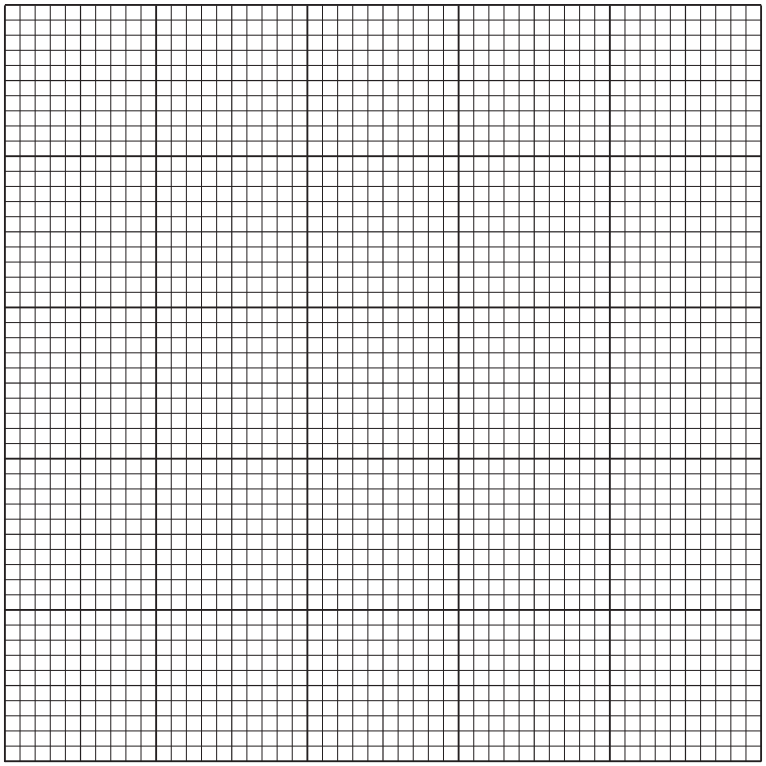
State the highest number of insects collected from one plant for each field.

field A .....

field B .....

[1]

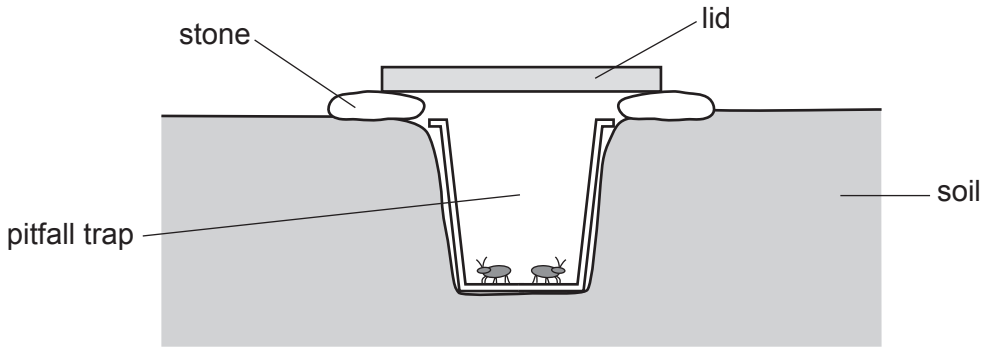
(iv) Plot a bar chart of the average number of insects on five leaves for each field.



[4]

(b) The student also investigates the number of insect pests on the soil.

The student puts a pitfall trap in the soil next to a peanut plant in 10 different locations in each field.



After 24 hours, the student counts the number of insect pests in each trap and takes an average.

The table shows the results of the student's soil investigation.

	field A	field B
average number of insect pests per trap	4	4

The farmer thinks the peanut harvest in field B is being reduced by insect pests on the leaves and on the soil.

Discuss whether the results of the student's two investigations support what the farmer thinks.

.....

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..... [2]

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(c) The student notices that there are differences in the soil composition in each field, which could also affect the peanut harvests.

(i) Complete the table to name **three** types of soil particle in order of size.

largest

smallest

name of soil particle
.....
.....
.....

[2]

(ii) Phosphate is a mineral ion that is present in a fertile soil.

State the names of **two** other mineral ions that are present in a fertile soil.

1 .....

2 .....

[2]

(iii) Mineral ions are a component of soil.

State **three** other components of soil.

1 .....

2 .....

3 .....

[3]

(d) The farmer uses bunds in field A and field B to reduce soil erosion.

State **one** other strategy for reducing soil erosion.

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..... [1]

[Total: 20]

3 The photograph shows some compressed earth building blocks.

Wet earth is compressed into block shapes by a machine. The blocks are then dried in the sun.



(a) (i) The compressed earth building blocks have holes in them to make them hollow.

Suggest **two** benefits of making the building blocks hollow.

1 .....

.....

2 .....

.....

[2]

(ii) The compressed earth building blocks can also be made by hand.

Suggest **two** advantages of making the building blocks by **machine**.

1 .....

2 .....

[2]

(b) Hollow building blocks are also made from cement.

The process of making cement releases carbon dioxide into the atmosphere.

(i) Explain how releasing carbon dioxide into the atmosphere contributes to the enhanced greenhouse effect.

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..... [3]

(ii) State the name of **one** gas, other than carbon dioxide, that contributes to the enhanced greenhouse effect.

..... [1]

(c) Wood can also be used for building.

An advantage of using wood for building is that it limits the use of cement.

(i) Suggest **two** other ways the government of Guinea can limit the use of cement.

1 .....

.....

2 .....

.....
[2]

(ii) Suggest **two** disadvantages of using wood for building.

1 .....

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2 .....

.....
[2]

[Total: 12]

4 Mining is an important industry in Guinea.

(a) The photograph shows an open-pit diamond mine in Guinea.



(i) Suggest reasons why there is less risk of injury and death working in an open-pit mine compared with working in a shaft mine.

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..... [2]

(ii) Suggest reasons why local people want diamond mining to continue in the area.

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..... [2]

(iii) Explain why an environmental impact assessment must be completed before a mining licence can be issued.

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..... [3]

(iv) Describe ways the landscape shown in the photograph can be restored after all the mining is finished.

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..... [4]

(b) There is a large global demand for rocks and minerals.

Describe strategies for the sustainable use of rocks and minerals.

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..... [4]

[Total: 15]

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