LAHORE GRAMMAR SCHOOL 55-MAIN GULBERG
Mock Examination

Name Of Student: _____ **Class and Section: 11 IGCSE**

Environmental Management **5014**

Paper 1 **March 2020**

1 hour 45 minutes

Additional Materials; Calculator, ruler and compass may be used.

READ THESE INSTRUCTIONS FIRST

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Write your Centre number, candidate number and name in the spaces provided.
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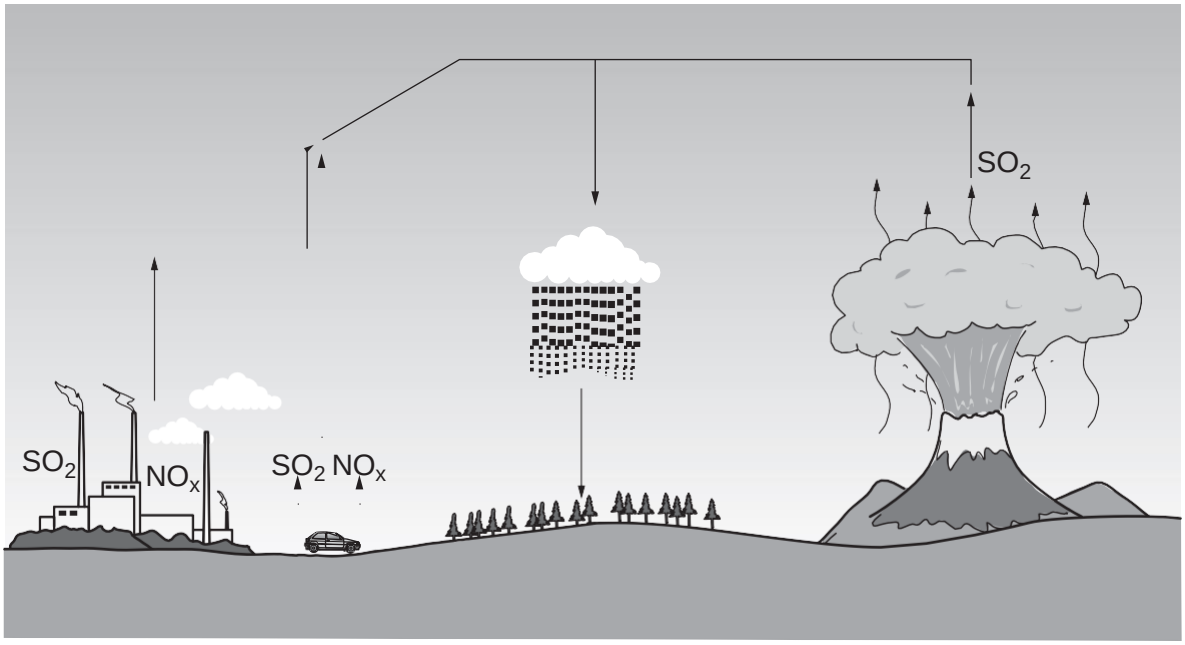
Answer all questions in the space provided. If additional space is required, you should use the lined pages at the end of the booklet. The question number(s) must be clearly shown.
Dictionaries are not permitted.
The Reading Booklet Insert contains the reading passages for use with all questions on the Question Paper.
The Insert is not assessed by the Examiner.
The number of marks is given in brackets [ ] at the end of each question or part question

Section A

1 Some gases, released from volcanoes, car exhausts and factories, can form acid rain.

(a) Use the diagram and your own knowledge to explain how acid rain is formed.



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..... [3]

(b) State **one** impact of acid rain on the environment.

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..... [1]

(c) Explain why countries need to work together to solve the problem of acid rain.

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..... [2]

2 Limestone is a rock extracted from the Earth.

The photograph shows limestone being extracted from the Earth.

(a) Name the method of rock extraction shown in the photograph.

..... [1]

(b) Suggest **one** positive effect and **one** negative effect of this method of rock extraction.

positive effect .....

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negative effect .....

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[2]

(c) Describe **two** strategies for the sustainable use of rocks.

1 .....

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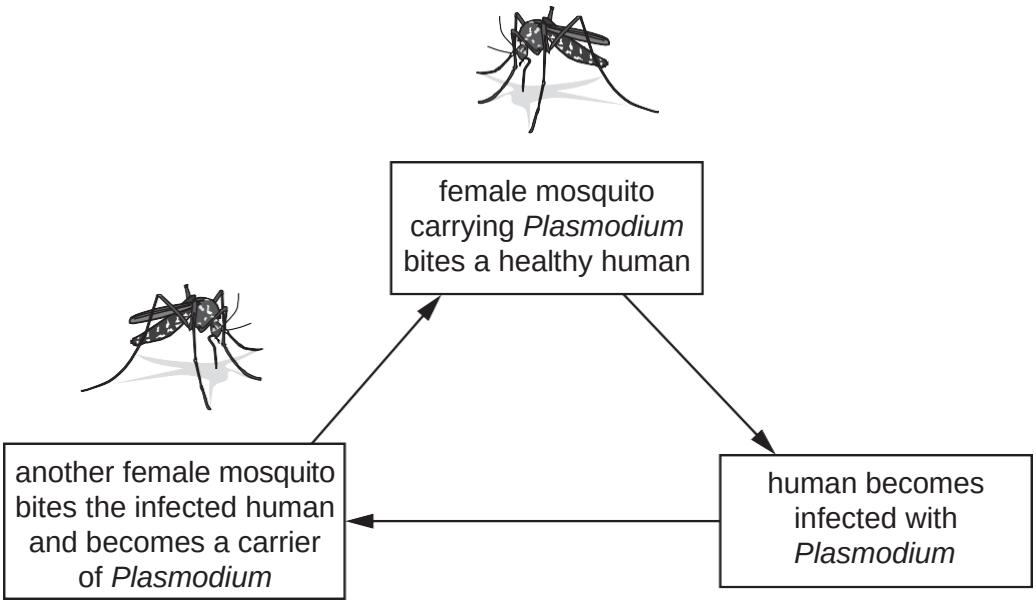
2 .....

..... [2]

3 The diagram shows a simplified life cycle of the malaria parasite, *Plasmodium*.



(a) State the vector in the spread of malaria.

..... [1]

(b) Describe how methods of vector control can reduce the spread of malaria.

You should include in your answer:

- methods of vector control
- how these methods can reduce the spread of malaria.

.....

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..... [3]

4 The photograph shows a coral reef ecosystem.

(a) State **two** abiotic components of an ecosystem.

1 .....

2 .....
[2]

(b) One food chain for a coral reef is shown.

plankton → coral polyp → butterfly fish → reef shark

Butterfly fish are at the third trophic level in this food chain.

Give the name of this third trophic level.

..... [1]

(c) Coral reef ecosystems are under threat from tourism.

State **two** strategies for preserving coral reefs from this threat.

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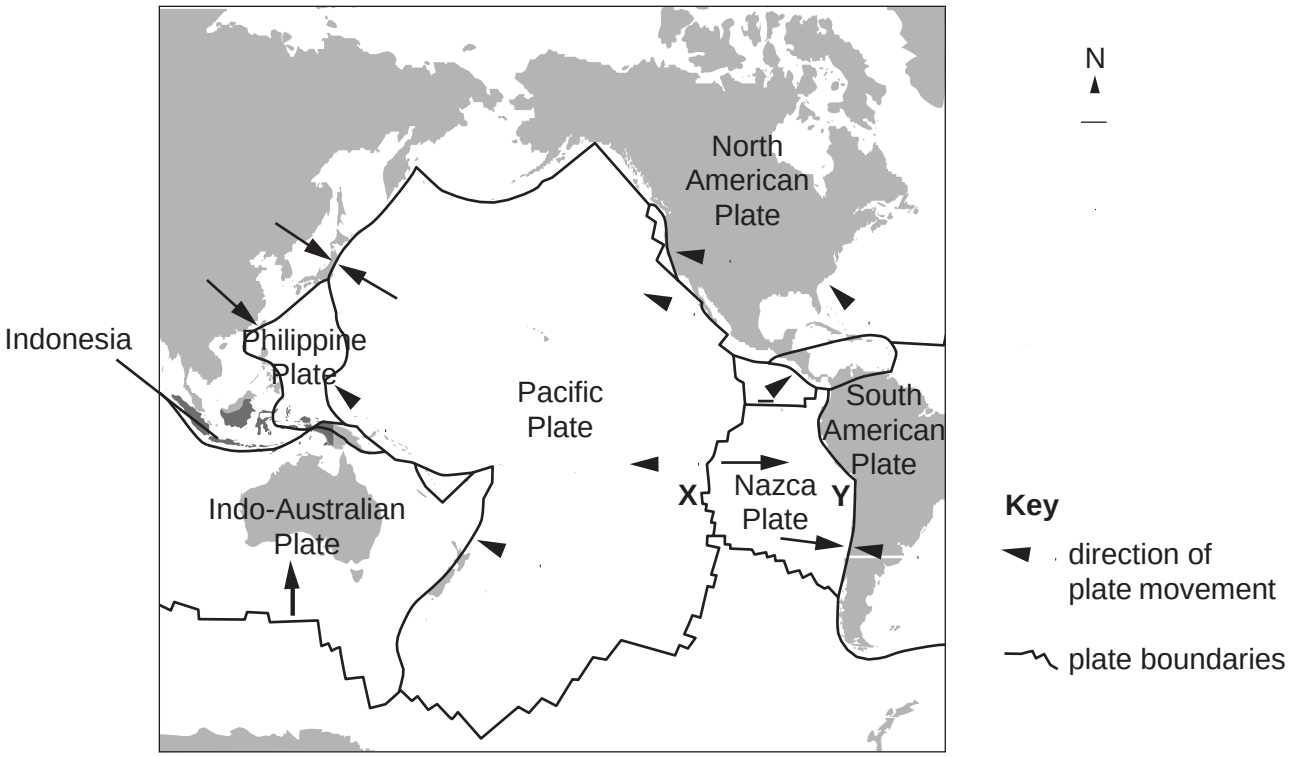
..... [2]

Section B

5 The map shows some plate boundaries in the region of the Pacific Ocean.



(a) (i) Name the types of plate boundary shown at **X** and at **Y**.

X .....

Y .....

[2]

(ii) Suggest why major earthquakes are more likely to occur close to plate boundaries than further away from them.

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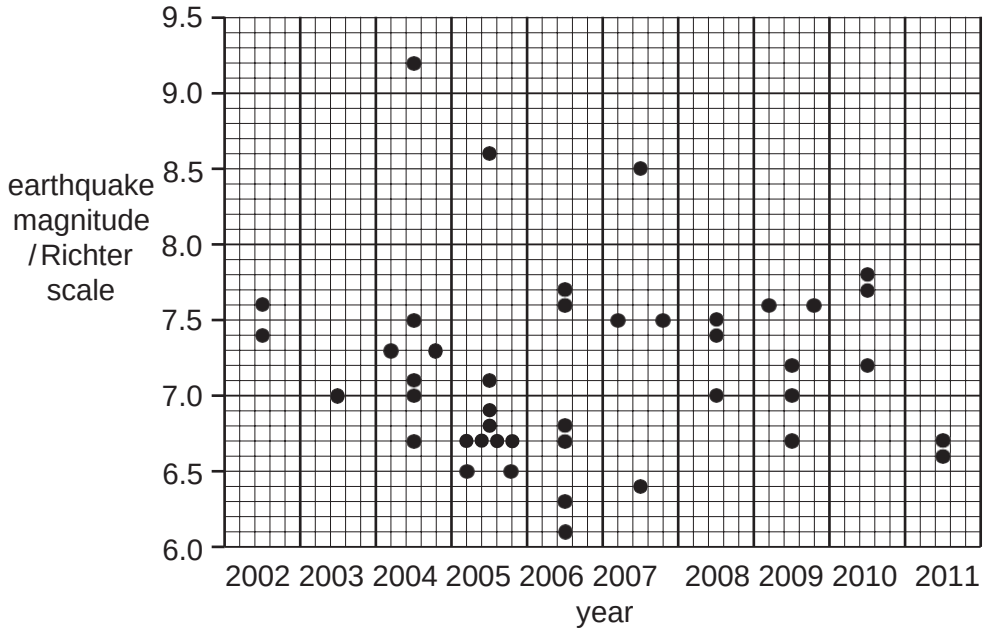
..... [3]

(b) Indonesia is marked on the map. It has many earthquakes. It is an island country of 18 000 islands.

The graph shows the magnitude of 43 strong earthquakes that occurred in Indonesia between 2002 and 2011 and were above magnitude 6.0 on the Richter scale.

Each dot shows an earthquake and its magnitude.



(i) Give the four-year period when earthquakes occurred most frequently. State the evidence which supports your choice of years.

four-year period .....

evidence .....

.....

.....

.....

[3]

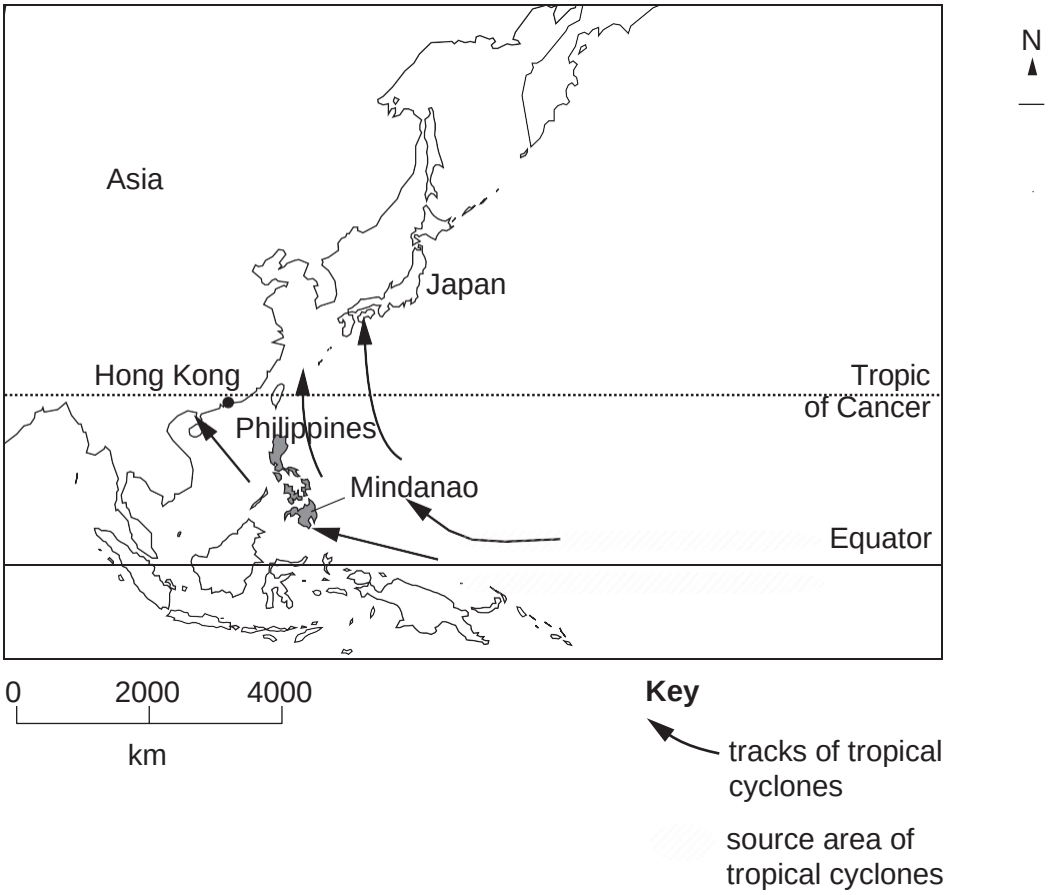
(ii) Suggest what the graph shows about the risk of earthquakes occurring in Indonesia.

.....

..... [1]

6 **(a)** People living in the Philippines are at a great risk from tropical cyclones. The country is hit by 20 or more tropical cyclones each year.

The map shows the location of the Philippines, and the source areas and tracks of the tropical cyclones in that part of the Pacific Ocean.



(i) Explain why many tropical cyclones are formed every year in the source area shown on the map.

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..... [3]

(ii) Suggest why the greatest tropical cyclone risk in the Philippines is during September and October.

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..... [1]

(b) In December 2011, the full effects of a tropical cyclone called Typhoon Washi were felt on the island of Mindanao.

The people living in the northern part of Mindanao were affected by the tropical cyclone in the following ways:

- severe flooding everywhere, including the main city of Cagayan de Oro
- flash floods and landslides swept houses into rivers and out to sea
- at least 1250 people died, most of them from drowning
- up to 500 000 people lost their homes.

(i) In Typhoon Washi, damage to property and loss of life were caused by the combined effects of very strong winds and heavy rainfall.

Suggest which one of these two causes was more important in Typhoon Washi. Describe the evidence which supports your choice.

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..... [2]

(ii) Survivors of Typhoon Washi blamed the government and local authorities for not doing enough to protect Mindanao against the cyclone risk.

Suggest why you would expect the authorities in the Philippines to be well prepared for cyclones.

.....

..... [1]

(iii) Different people in the Philippines made comments after Typhoon Washi.

A Local official in Cagayan de Oro

'The government in Manila, the capital of the Philippines, did not give us advanced storm and flood warnings or money to build enough cyclone shelters.'

B Government official in Manila

'The government has a system to send storm warnings via mobile phone text messages. It was not used for this typhoon because wind strength was too weak to trigger the warnings.'

C National Disaster Management official in Manila

'City officials should never have allowed people to build their own shanty houses on sand banks in the Cagayan River.'

D Environmental group

'Cagayan de Oro was at high risk because it is between steep-sided, deforested mountains and the sea. No flood defences had been built because local officials claimed that typhoons were infrequent in northern Mindanao.'

Suggest whether physical factors, human factors or a combination of both were responsible for the great loss of life in Typhoon Washi.

Support your view with references to the comments made by the different people.

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..... [7]

7 Oil is a fossil fuel.

(a) Describe the formation of oil.

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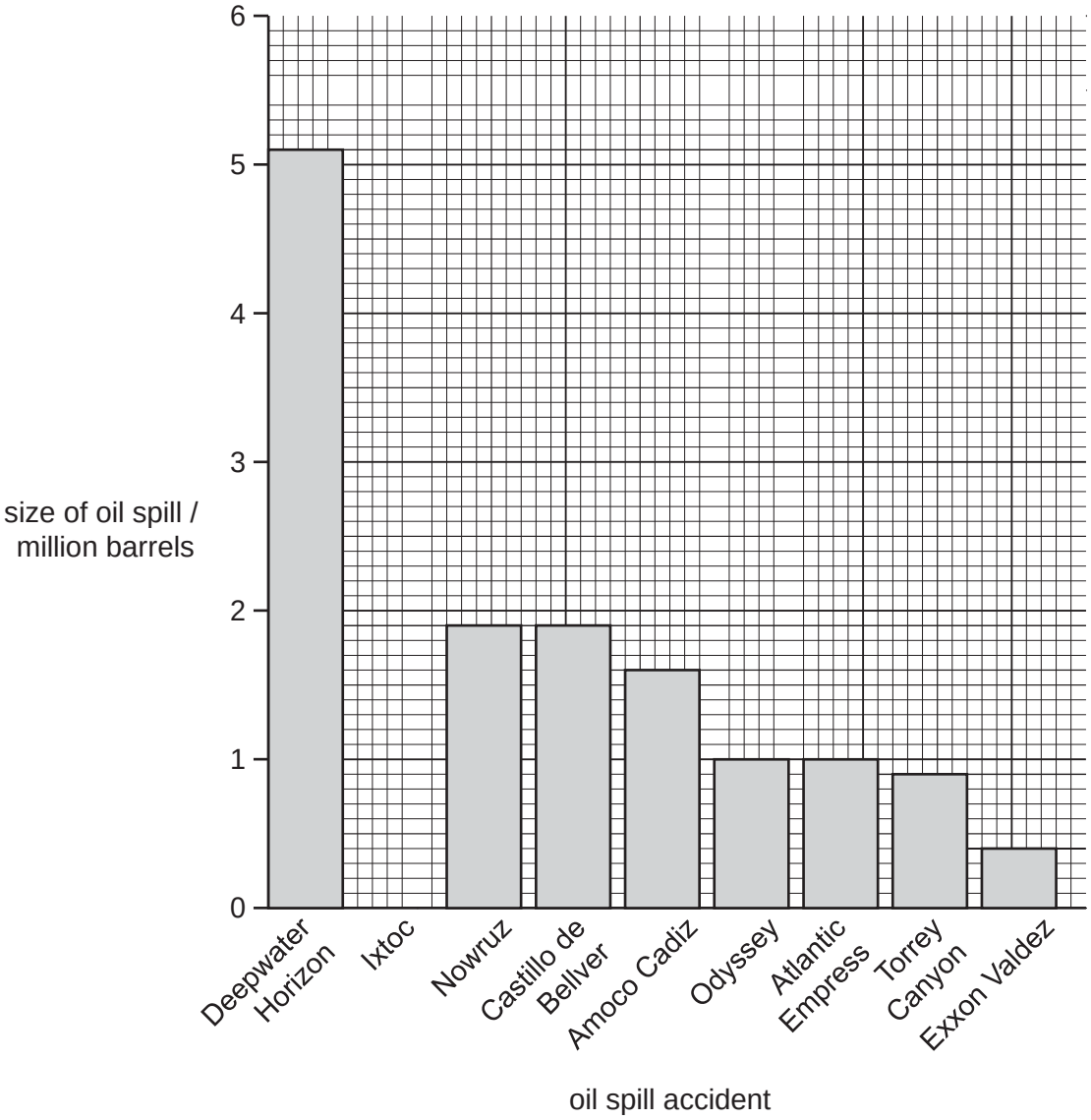
..... [3]

(b) The graph shows the size of some major accidental oil spills into the ocean.



(i) Complete the graph for the Ixtoc oil spill, to show that 3.3 million barrels of oil were spilled into the ocean. [1]

[Turn over

(ii) In 2010, the Deepwater Horizon oil spill was the largest accidental marine oil spill in the world.

It was estimated that oil was released into the ocean for approximately 85 days.

Calculate the average amount of oil released into the ocean per day.

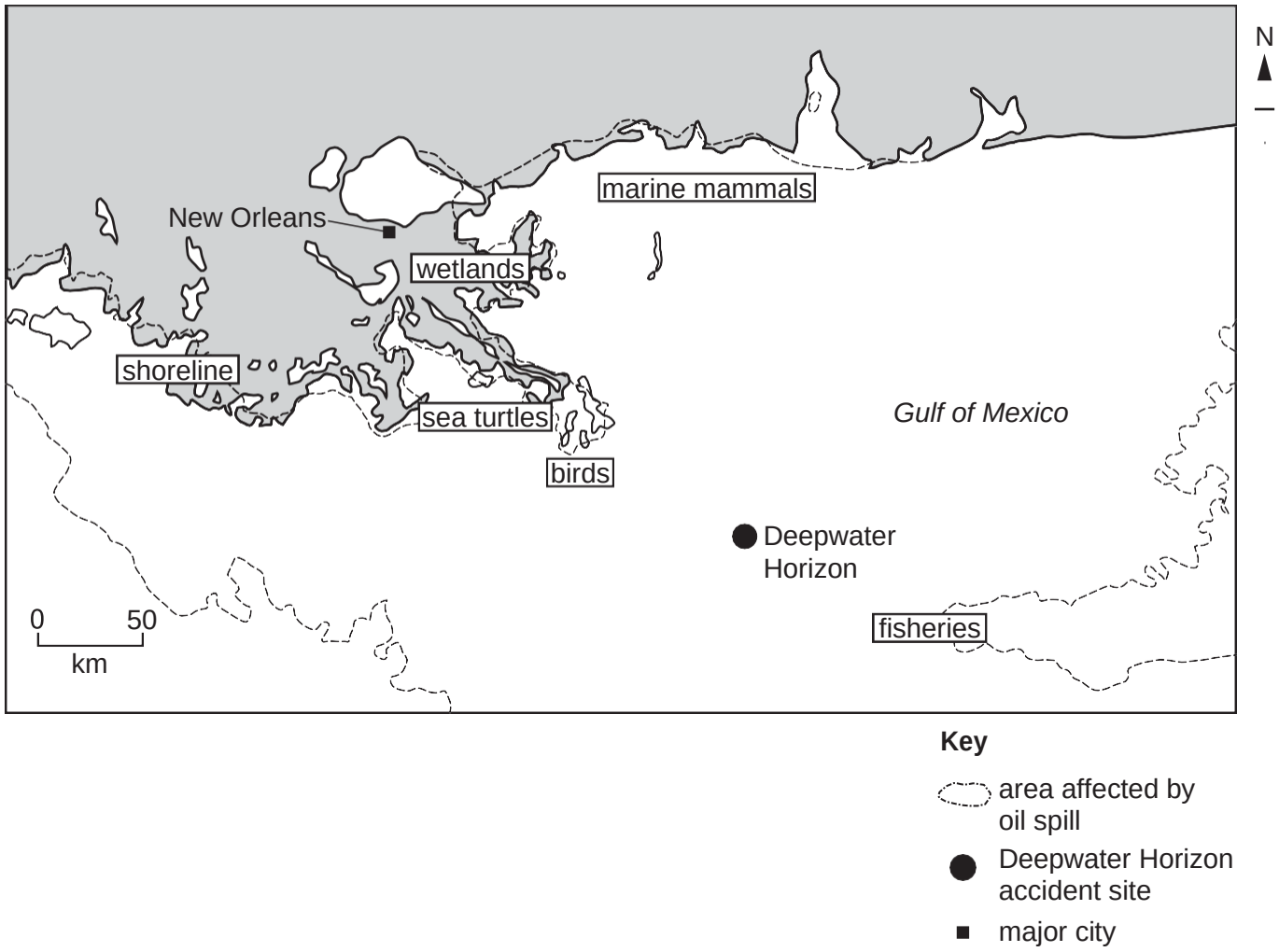
..... million barrels per day [1]

(iii) Suggest why this average amount of oil was **not** released on every day of the oil spill accident.

.....

..... [1]

(c) The map shows the area affected by the Deepwater Horizon oil spill.



Suggest the possible impacts of the Deepwater Horizon oil spill on the coastal ecosystem.

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..... [4]

(d) State **two** strategies for minimising the impacts of marine oil spills.

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..... [2]

(e) Fossil fuels, such as oil, are limited and non-renewable.

Suggest why some countries are **not** investing in alternative forms of energy.

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..... [3]

8 The table shows population data in some countries in 2013.

country	birth rate per 1000 people	death rate per 1000 people	natural increase per 1000 people
Bulgaria	9.6	14.2	.....
Japan	8.4	9.5	–1.1
Pakistan	25.2	7.3	.....

(a) (i) Complete the table to calculate the natural increase for Bulgaria and Pakistan.
One has been completed for you. [1]

(ii) Use the data in the table for 2013 to predict what will happen to the population of Japan if the birth and death rates remain unchanged.

..... [1]

(iii) Suggest **two** reasons for the change in population you have predicted in **(ii)**.

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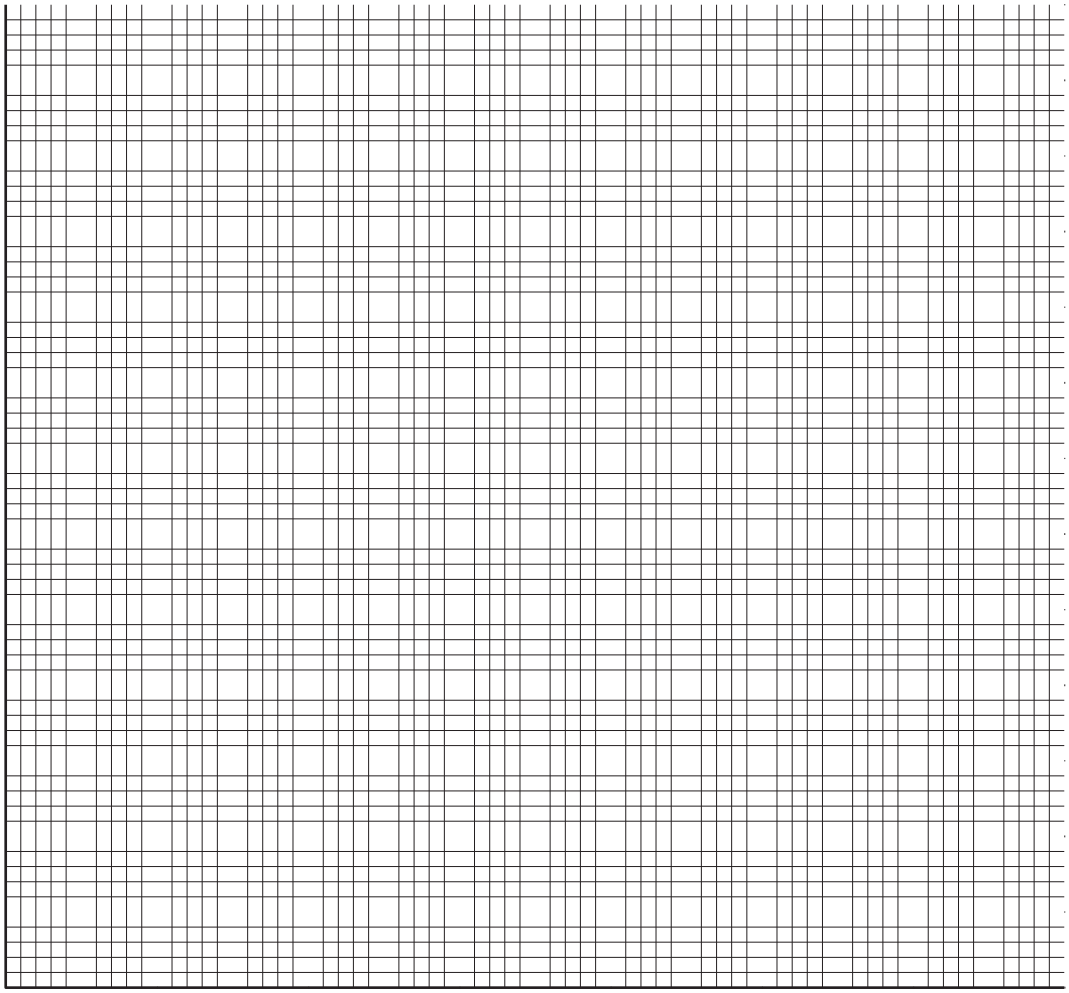
..... [2]

(b) Use the data in the table to plot a graph for birth rate and death rate for each country. Label the axes and complete the key.



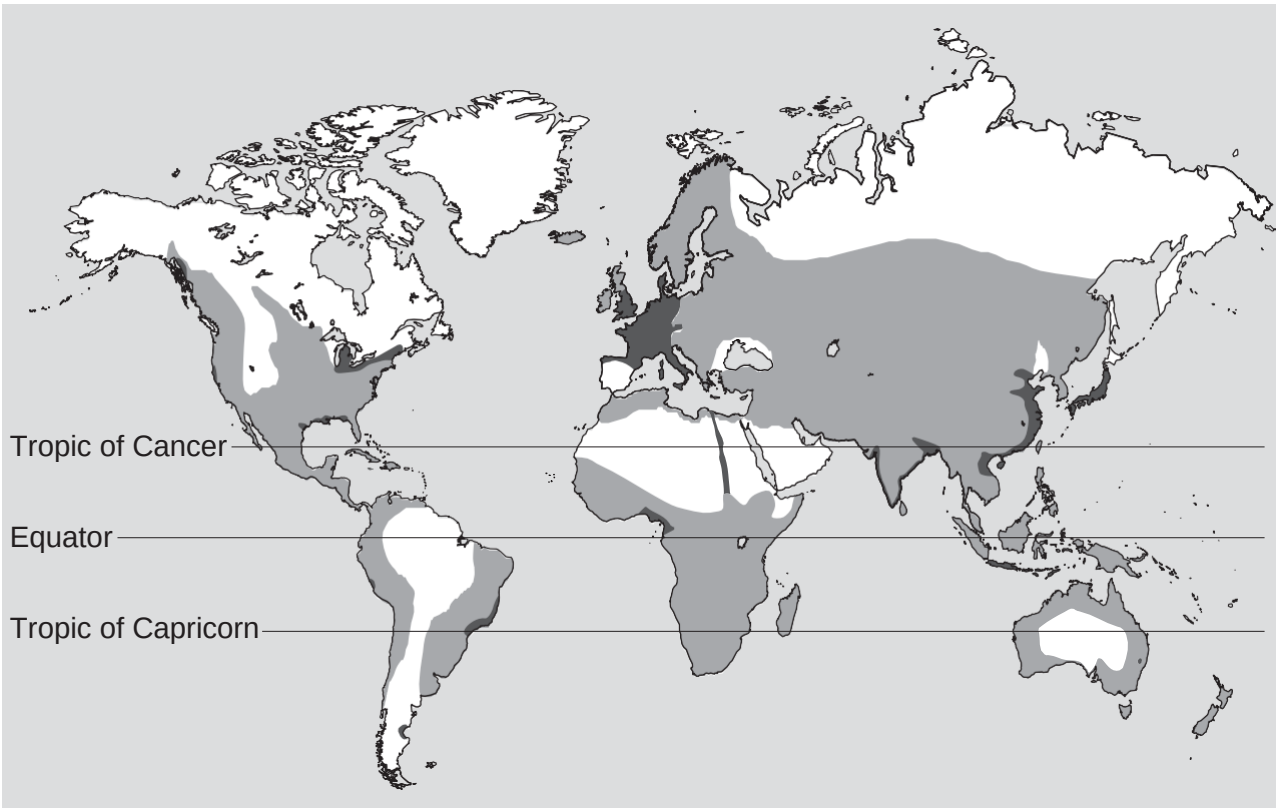
Key

☐ .....

☐ .....

[4]

(c) The map shows world population density.



Key

.....

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.....

(i) Complete the key using the following terms.

high population density medium population density low population density

[1]

(ii) State **one** factor that attracts people to migrate to an area and **one** factor that discourages them.

attracts .....

.....

discourages .....

.....

[2]

9 A student read an article in a scientific journal.

The article said:

> Modern fishing nets are large and cover a wide area. They catch all the fish species and only the smaller fish escape. The unwanted fish are called bycatch. Bycatch can be a large part of the total fish caught.
>
> Many fish caught as bycatch die in the nets. The death of bycatch fish is recorded as mortality rate. It is used by scientists to understand the effects of fishing on each fish species.
>
> The amount of bycatch caught and the mortality rate are recorded for each type of fishing method. This information is important for the sustainability of fisheries.
>
> In the North Pacific for crab pot fishing the mortality rate was 45–100%, for groundfish trawl it was 90–100%, domestic trawl fishing was 10–42%, longline fishing was 32–50% and shrimp fishing was 100%.

(a) Use the article to help answer the questions.

(i) State the meaning of the term *bycatch*.

.....

..... [1]

(ii) State why monitoring bycatch is important.

.....

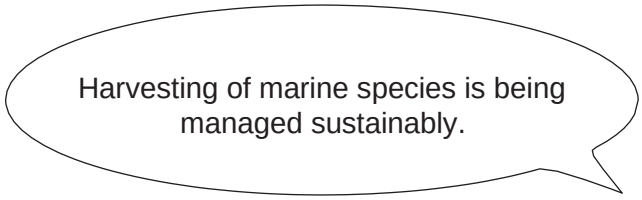
..... [1]

(b) The student wants to summarise the mortality rate data in the article.

Record the data in a suitable table.

[3]

(c) The student said,



To what extent do you agree with this statement? Give reasons for your answer.

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..... [6]

LAHORE GRAMMAR SCHOOL 55-MAIN GULBERG
Mock Examination

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Environmental Management **5014**

Paper 2 **March 2020**

1 hour 45 minutes

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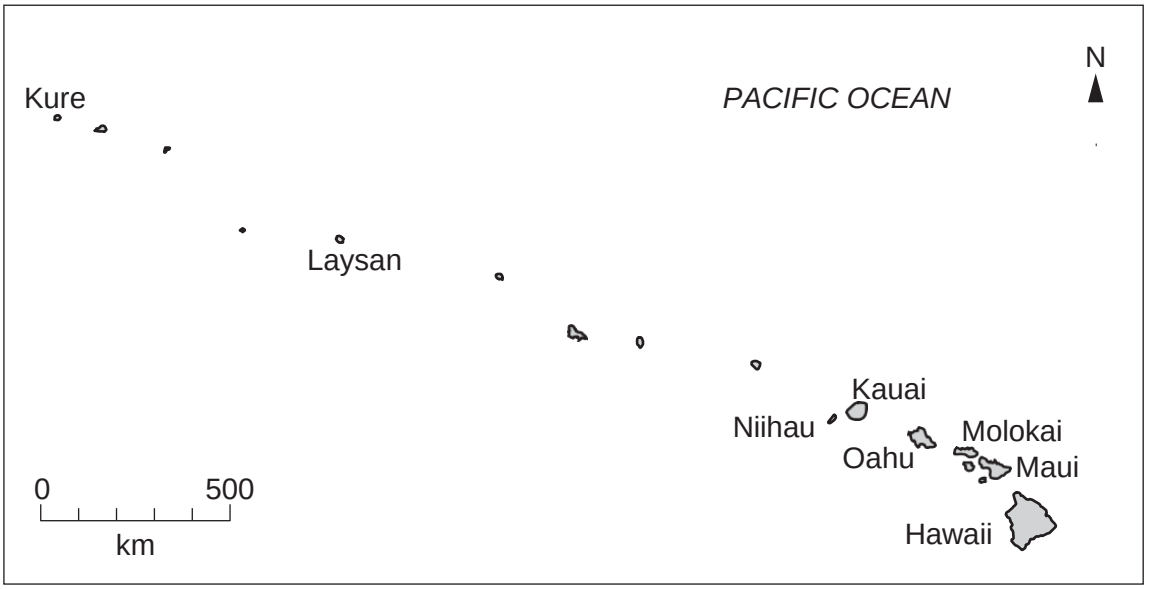
map of the world

map of Hawaiian islands



area of the state of Hawaii: 28 311 km^2

population: 1.43 million (in 2015)

children per woman: 1.85

life expectancy: 81.3 years

currency: USD

languages: English, Hawaiian

main economic activities: agricultural production, fishing and tourism

1 Hawaii is a state of the USA; it is a long chain of volcanic islands. People only live on the larger islands. The small islands are uninhabited. Crops are grown on the lower slopes of the volcanoes. More than six million tourists visit this state every year.

(a) Use the map and scale to estimate the distance between

Oahu island and Laysan island ..... km

Hawaii island and Kure island ..... km
[2]

(b) The population of the four largest Hawaiian islands is shown in the table.

island name	population in 2015	estimated population in 2020
Hawaii	202 700	220 900
Oahu	976 200	1 003 700
Kauai	71 400	75 600
Maui	168 000	181 000
total	1 418 300	.....

(i) Calculate the total estimated population in 2020.
Complete the table. [1]

(ii) Calculate the percentage of the total population that is expected to live in Oahu in 2020.
Give your answer to one decimal place.

Show your working.

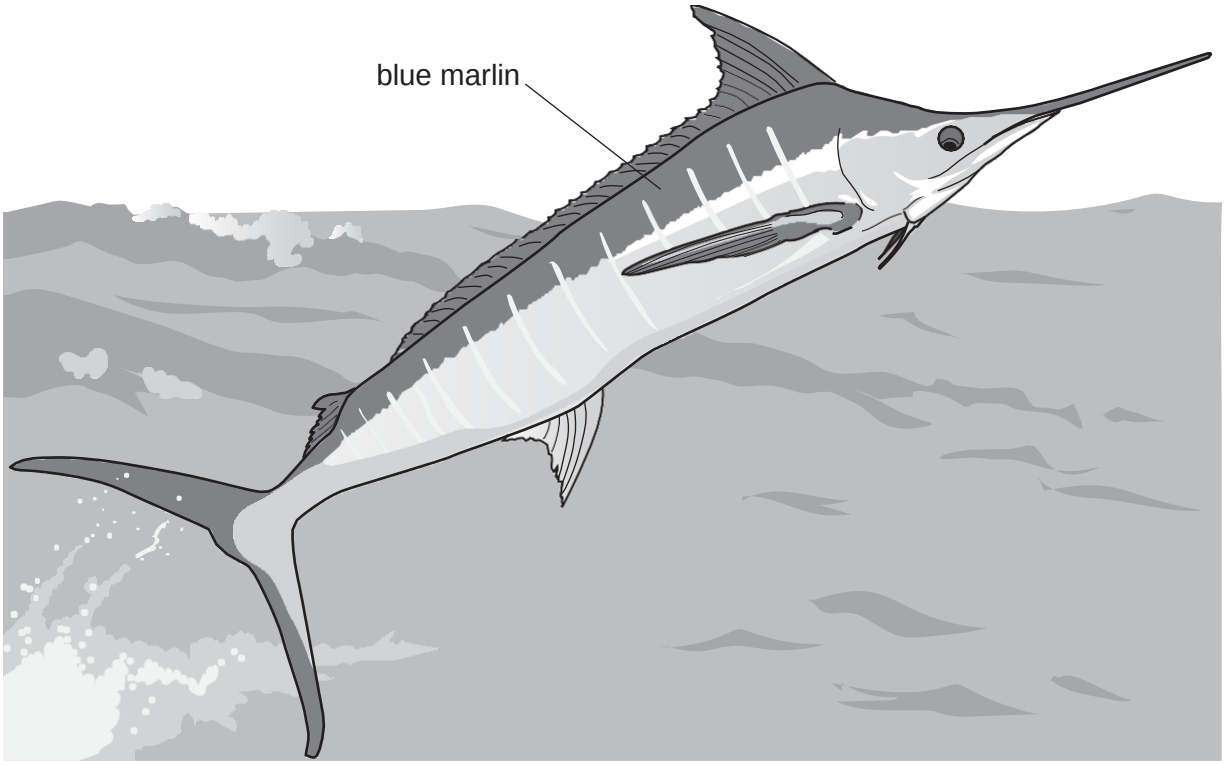
.....% [2]

(iii) List the island names in rank order of 2015 population from highest to lowest by completing the table.

	island name
highest ↓	.....
	.....
	.....
lowest	.....

[2]

(c) More than six million tourists visit the Hawaiian islands each year. Many tourists go sport fishing for a large fish called the blue marlin.



These fish are caught out at sea by rod and line from boats hired by tourists.

A boat captain said

> In my experience,
> July is the best month
> to catch blue marlin and
> January is the worst.

A student wanted to find out more about the number of blue marlin caught in January and July. The student decided to ask boat captains how many blue marlin they were catching.

The student said

> I will go to the harbour and ask the boat captains
> of the first three boats that return to harbour. I will do this on three separate days
> in January and again in July.

(i) Draw a table the student could use to record the results collected in January.

[3]

(ii) Suggest **two** advantages of asking each boat captain the same question.

1 .....

.....

2 .....

.....[2]

(iii) Female blue marlin are the most desirable sport fish. Many of these fish die after being caught by tourists. They are much larger than the male fish. Some scientists are worried that catching more female than male fish will damage the population of blue marlin.

Explain why catching female fish may damage the population of blue marlin.

.....

.....

.....

.....[2]

(iv) The blue marlin is a top carnivore in the marine ecosystem.

phytoplankton ⟶ zooplankton ⟶ small fish ⟶ large fish ⟶ blue marlin

The blue marlin may be in danger of being overfished.

Suggest what might happen to the population of large and small fish if the blue marlin are overfished.

Explain your answer.

large fish population.....

explanation.....

.....

small fish population.....

explanation.....

.....

[3]

(v) The authorities in Hawaii control the sport fishing activity to try to make this activity sustainable.

Describe the measures that can be taken to control sport fishing.

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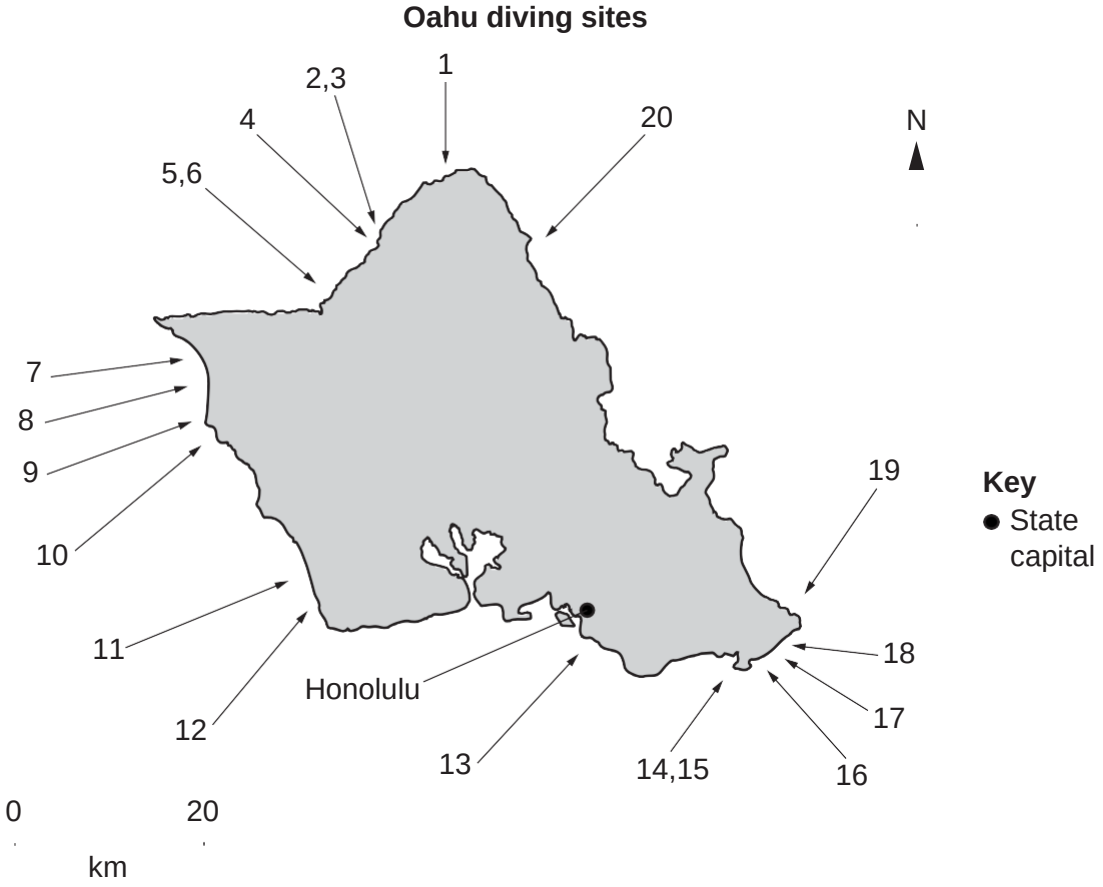
.....[5]

(d) Tourists also come to the Hawaiian islands to see the colourful fish living in lagoons. The main diving sites around the island of Oahu are shown on the map.



(i) Suggest why a recent survey showed that diving site 20 has the least damage due to diving.

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.....[2]

(ii) The peacock grouper is a fish that was introduced to Hawaiian lagoons 65 years ago as a new source of food for humans. The population of peacock groupers increased rapidly. The peacock grouper feeds on a large number of young fish of many species. Unfortunately about 20% of these peacock groupers contain a poison that can make humans very ill. Now these fish are never eaten but are found in large numbers in all the lagoons around the islands.

Surveys of some lagoons indicate that the introduction of the peacock grouper has reduced biodiversity more than fishing.

What do you understand by the term *biodiversity*?

.....

.....[1]

(iii) In an attempt to control the peacock grouper, spear-fishing competitions are held regularly. All the fish caught are given to local farmers.

Suggest how the farmers could use the dead fish to increase crop growth.

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.....

.....

.....[2]

(iv) Are these spear-fishing competitions a good strategy for environmental management?

Explain your point of view.

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.....

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.....[3]

2 **(a)** The photograph shows an albatross and chick. The albatross is a bird that feeds on small fish caught near the surface of the sea. The material that the albatross birds cannot digest is formed into a pellet called a bolus. This bolus is brought up from the stomach and ejected. The albatross birds often mistake floating plastic pieces for their prey.

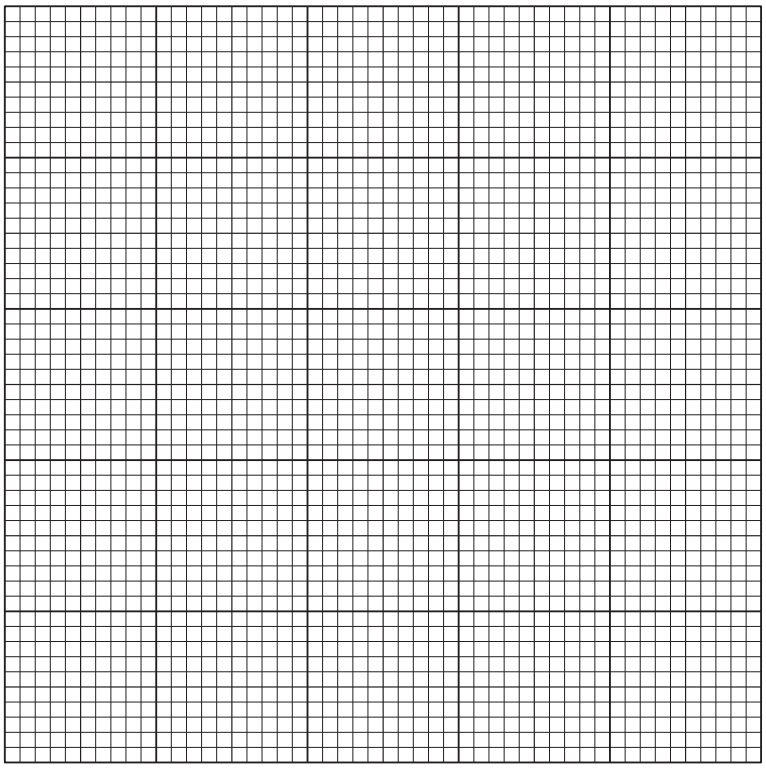
The tables show the results of a survey of the plastics found in some boluses from albatross nest sites on the Hawaiian islands Oahu and Kure.

	Oahu island	
bolus sample	**number of plastic pieces**	**mass of plastic/ g**
1	18	3
2	21	5
3	16	5
4	18	8
5	19	8
6	16	6
7	15	4
8	12	1
average	17	5
range	from 12 to 21	from 1 to 8

	Kure island	
bolus sample	**number of plastic pieces**	**mass of plastic/ g**
1	54	85
2	83	40
3	90	15
4	61	41
5	101	34
6	72	10
7	53	17
8	62	54
average	72	.....
range	from ..... to	from ..... to .....

(i) Complete the table for Kure island. [2]

(ii) Plot a bar graph of the average number of plastic pieces and the average mass of plastic for both islands. Include a key.



[4]

(iii) What conclusions could you draw from this survey?

.....

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.....[2]

(b) Albatross spend months out at sea. Scientists have found that the average wind speed across the Pacific Ocean increased from 24.8 to 27.4 km per hour between 1988 and 2011. When the winds are stronger, these birds lose weight. As a result the birds breed less successfully.

(i) Calculate the percentage increase in average wind speed between 1988 and 2011.

Show your working.

.....% [2]

(ii) Suggest reasons why the birds lose weight and breed less successfully.

.....

.....

.....

.....[2]

(iii) Suggest **one** possible cause for the increase in average wind speed over the Pacific Ocean.

.....

.....[1]

(c) Large numbers of waste plastic pieces are found on all the beaches of Oahu. Some of the most polluted beaches are in the north east of the island.

A student visited a beach and collected a few items of waste plastic. These are shown in the photograph.

The student noticed that there were more plastic bottle tops than plastic bottles on the beach.

(i) Suggest **two** possible reasons for this.

1 .....

.....

2 .....

.....

[2]

(ii) The student decided to perform a survey of one beach in the north and one beach in the south of Oahu island. The following method was used.

Step 1 Lay out a 30 m tape along the top of the beach.

Step 2 Place a 0.25 m^2 quadrat at the 5 m mark on the tape.

Step 3 Remove all the waste plastic pieces in the quadrat. This is sample one.

Step 4 Repeat steps 2 and 3 at the 10, 15, 20 and 25m marks on the tape.

Step 5 In the laboratory, separate each sample into the different types of waste plastic.

Step 6 Record the results in a table.

Name the type of sampling used in this method.

.....[1]

The results are shown in the table.

		average mass in a 0.25 m^2 quadrat	
		south beach / g	north beach / g
type of plastic	bottle tops	9	21
	bottles	28	50
	toothbrushes	18	29
	other plastic waste	45	125
	total	100	225

The student estimated the area of each beach covered in plastic waste.

south beach 1500 m^2 north beach 2250 m^2

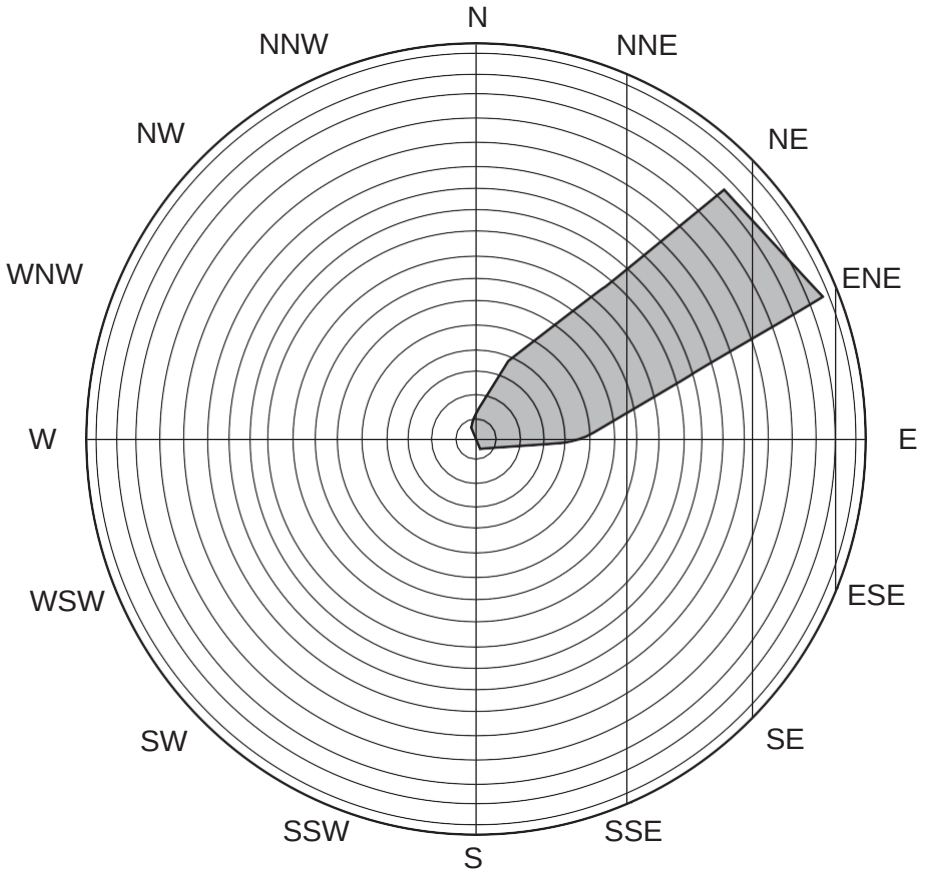
(iii) Calculate an estimate of the total mass, in kg, of plastic waste on each beach.

Show your working.

south beach .....kg

north beach.....kg
[3]

(iv) The student found information about the wind direction during the year for Oahu island.



How does this information explain the difference in mass of the plastic waste between the north and south beach?

.....

.....[1]

(v) Suggest **one** other possible reason for the difference in mass of the plastic waste between the north and south beach.

.....

.....[1]

(vi) Most toothbrushes are made of plastics that cannot be recycled.

State **two** different methods of disposing of toothbrushes to prevent them entering oceans.

1 .....

2 .....

[2]

(d) Most plastic waste in the ocean eventually breaks down to form microplastic particles. These can only be seen using a microscope. Microplastics have been found in the tissues of many marine organisms. Explain why high concentrations of microplastics are often found in organisms at the top of marine food chains.

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.....[3]

(e) Plastic waste in the oceans is an international environmental problem. Governments want to reduce the mass of plastic waste in the oceans by 2030.

Suggest why it will be difficult to reduce this problem by 2030.

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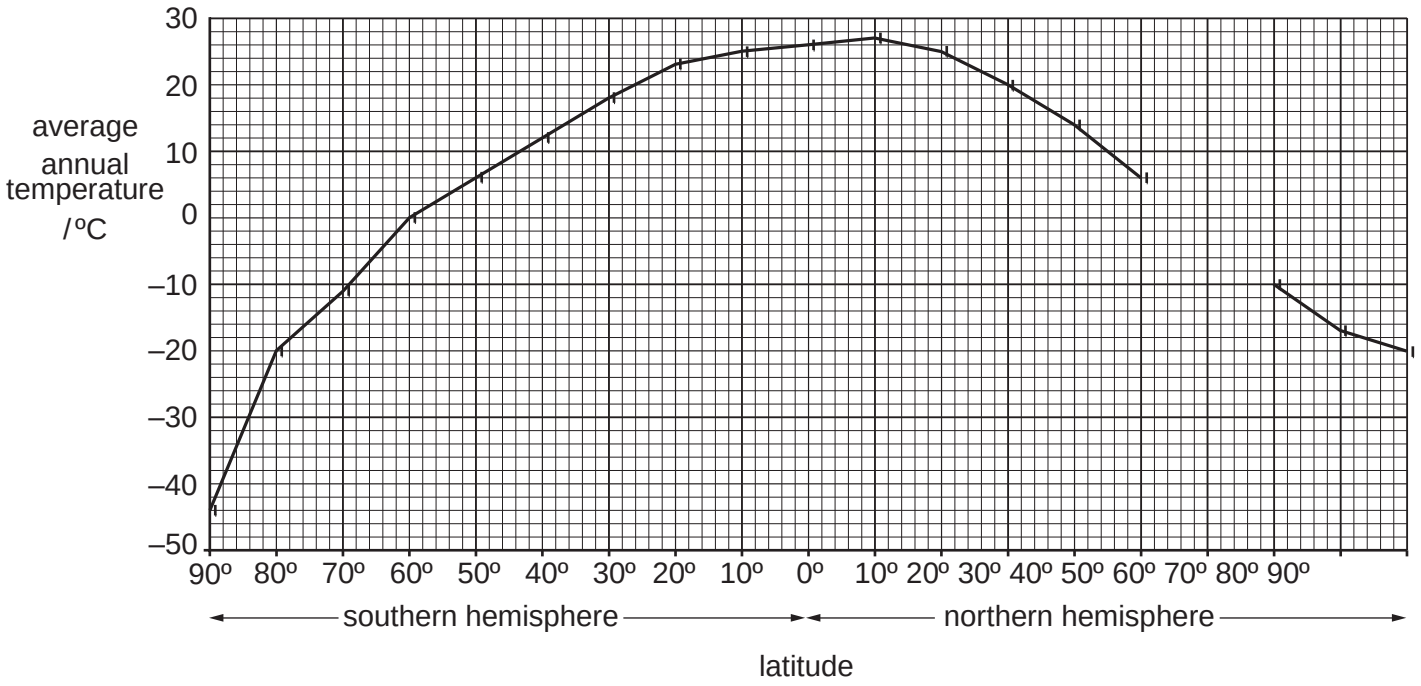
.....[4]

3 **(a)** The graph shows average annual temperatures at different latitudes.



(a) Use the information in the table to complete the graph.

latitude	60° N
temperature	–1°C

[1]

(b) Describe the change in average annual temperature between the Equator (0°) and 70° N.

.....

.....

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.....[2]

(c) Explain the difference in the average annual temperature at the Equator (0°) and at 70° N.

.....

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.....

.....[2]

(b) **(i)** Explain how human activities could increase the global atmospheric temperature.

.....

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.....

.....[2]

(ii) Suggest why some countries may **not** agree to reduce activities that increase the global atmospheric temperature.

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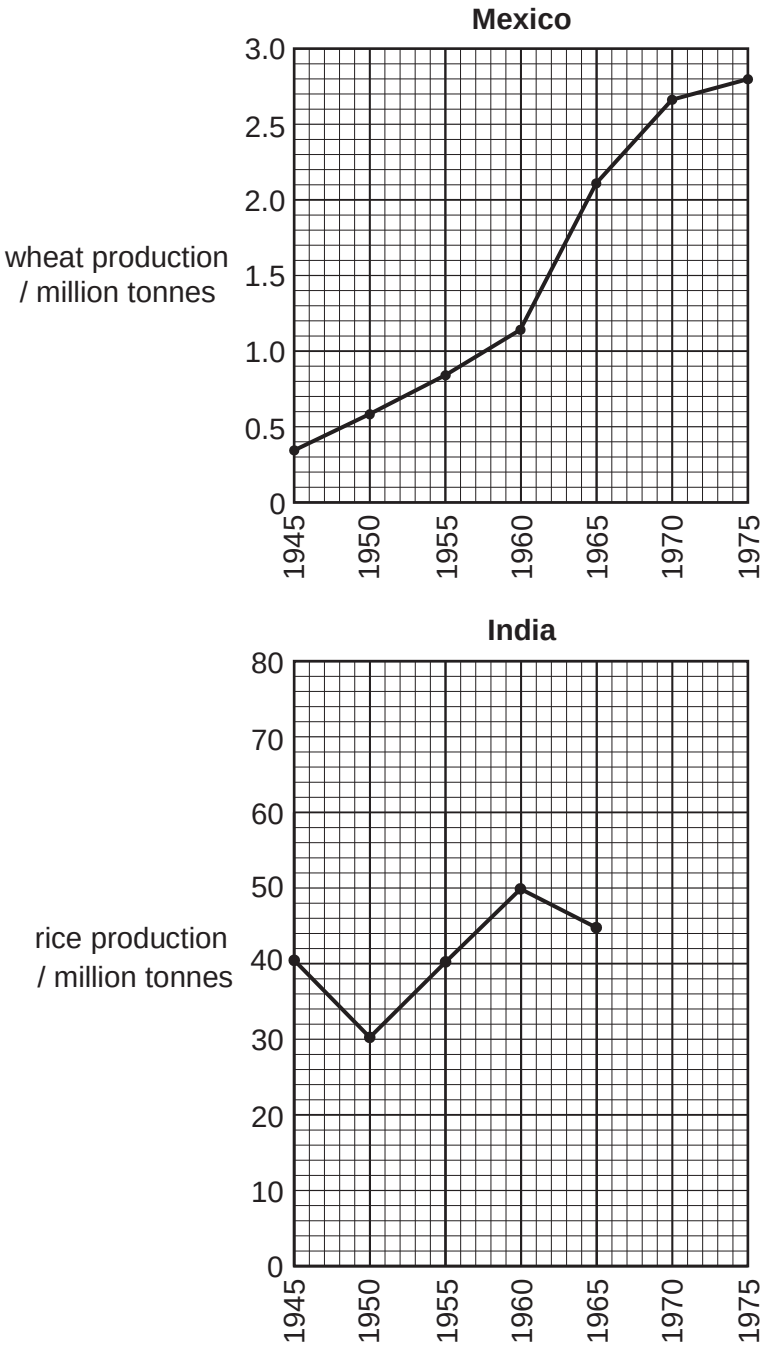
.....[3]

(b) The graphs show wheat production in Mexico and rice production in India during the green revolution.



(i) Use the information from the graphs to describe the trend in wheat production in Mexico from 1945 to 1975.

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.....

.....[2]

(ii) State the five-year period during which wheat production increased the most in Mexico.

.....[1]

(iii) Complete the line graph for India by plotting the following information.

year	rice production / million tonnes
1970	65
1975	71

[2]

(iv) Calculate the increase in rice production in India between 1945 and 1975. Give the unit.

.....[1]

(v) Suggest reasons why some people did not agree with the green revolution even though production increased.

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.....[3]