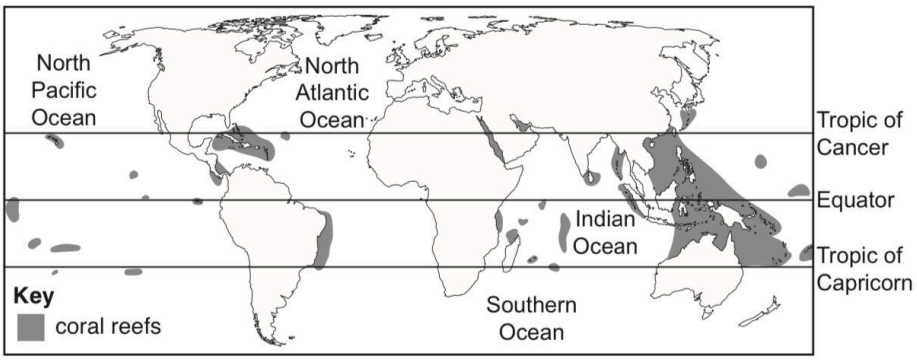
6 **(a)** The map shows the location of coral reefs.




**(i)** Describe the location of coral reefs as shown on the map.

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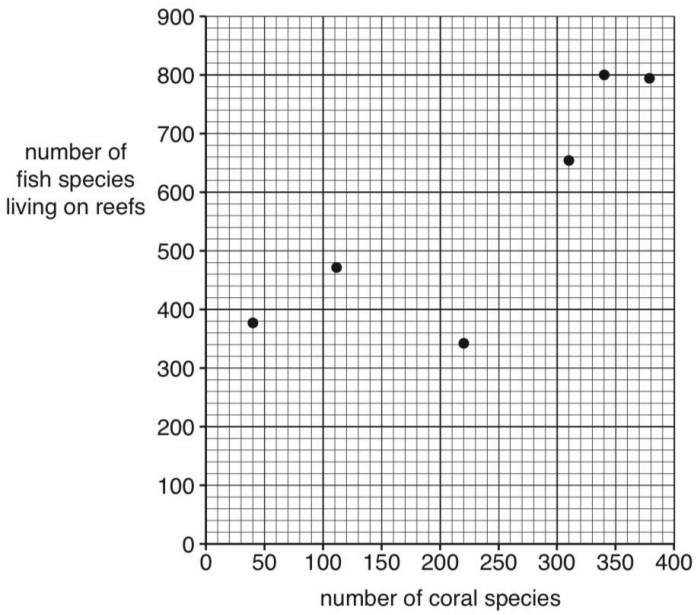
.....[3]

**(ii)** Suggest **one** reason why coral reefs are not found in the North Atlantic Ocean or the North Pacific Ocean.

.....

.....[1]

**(b)** The graph shows the number of coral species and the number of fish species living on reefs.




Describe the relationship between the number of coral species and the number of fish species living on reefs.

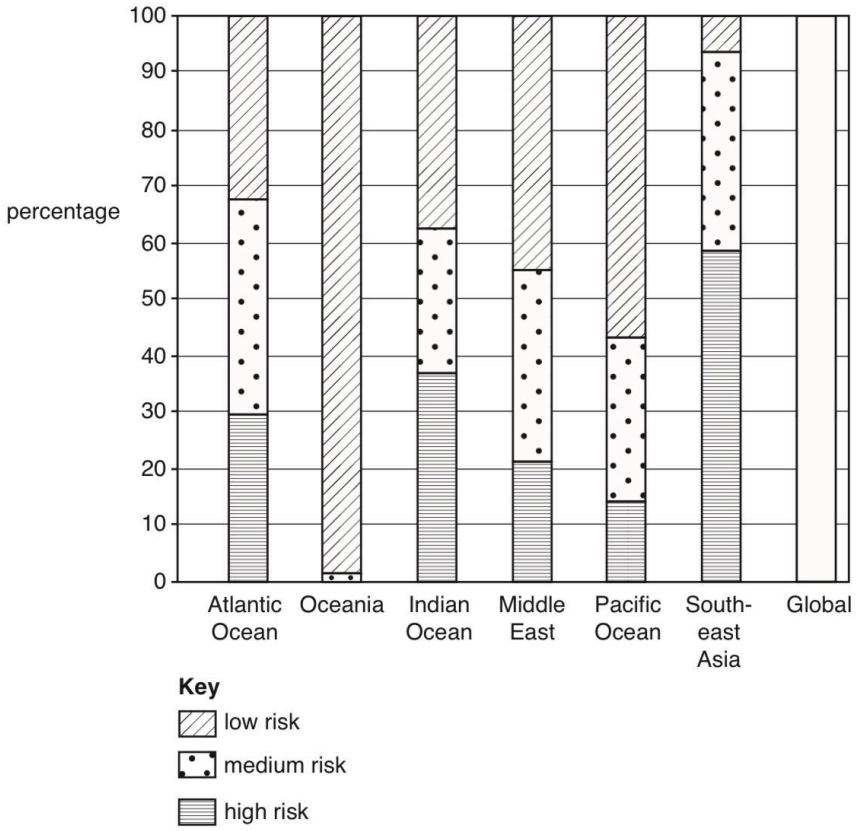
.....

.....

.....

.....[2]

**(c)** The graph shows the percentage of coral reefs at risk from overfishing.




**(i)** Complete the global column using the following figures.

| | |
|---|---|
| high risk | 27% |
| medium risk | 30% |
| low risk | 43% |

[2]

**(ii)** Use the graph to complete the following paragraph.

The area where coral reefs are at least risk from overfishing is ..... .

The reefs in Southeast Asia are most at risk from overfishing, with ..... % at high risk and just 7% at ..... risk. [3]

**(iii)** Suggest why the risk to coral reefs from overfishing is higher in some areas than in others.

.....

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.....

.....[3]

**(iv)** Give **one** reason why the fish catch from the oceans has increased.

.....

.....[1]

**(v)** Describe strategies that can be used to reduce overfishing.

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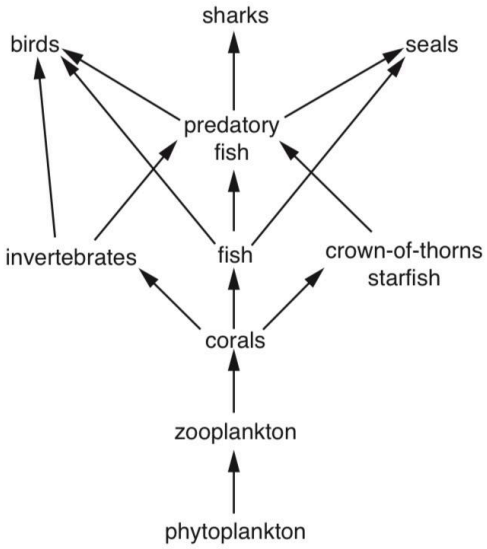
.....[4]

**(d)** The diagram shows a simplified food web for a coral reef.




**(i)** State the producer in the food web shown.

.....[1]

**(ii)** Complete the food chain diagram.

| |
|---|
| seals |
| |
| |
| |
| phytoplankton |

[3]

**(iii)** Describe the changes to the food chain in **(ii)** if the number of seals decreased.

.....

.....

.....

.....

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.....[3]

**(iv)** Crown-of-thorns starfish have few predators because they are covered in spines and contain a chemical which tastes unpleasant. In one year each starfish can consume 6 $m^2$ of coral.

Explain why crown-of-thorns starfish can destroy coral reefs.

.....

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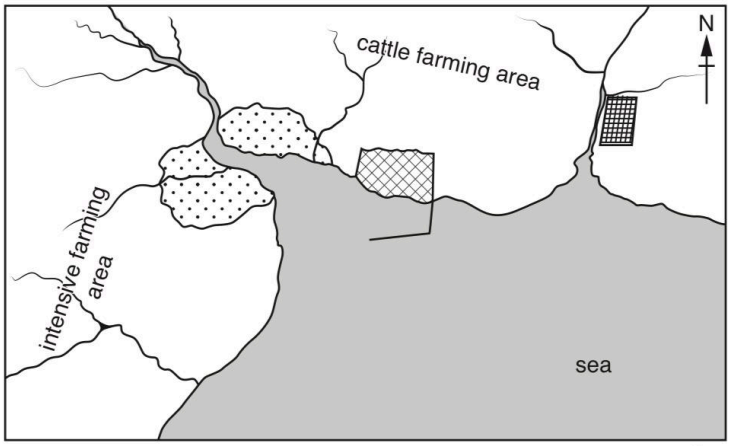
.....[2]

**(e)** The map shows a coastal area.




not to scale

**Key**

- city
- oil refinery
- lead mine and processing plant
- rivers
- harbour

Explain how each of the following may damage life in the sea.

the oil refinery .....

.....

.....

.....

farming .....

.....

.....

.....

lead mining and processing .....

.....

.....

.....

[6]

**(f)** Explain why marine pollution is difficult to control.

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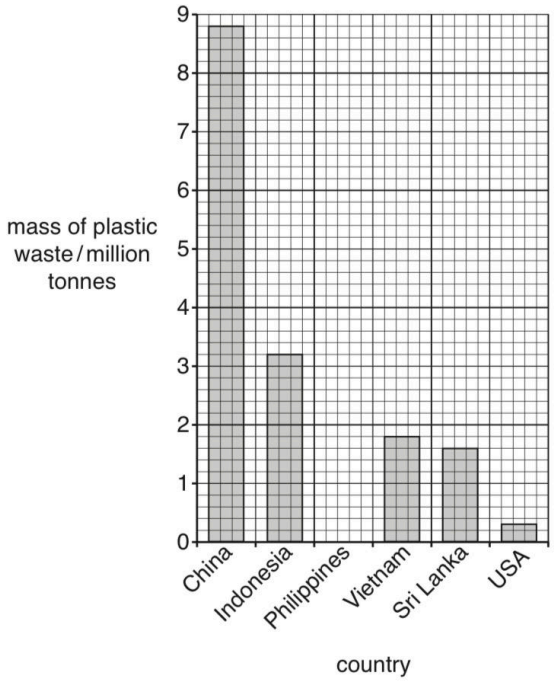
.....[6]

**2** **(a)** The bar graph shows the mass of plastic waste that entered oceans in 2010 from six countries.




**(i)** Complete the bar graph to show that 1.8 million tonnes of plastic waste entered the ocean from the Philippines in 2010. [1]

**(ii)** State the mass of plastic waste that entered the ocean from Indonesia.

..... million tonnes [1]

**(iii)** Compare the mass of plastic waste that entered the oceans from the coast-lines of China and the USA in 2010.

.....

.....[1]

**(b)** Suggest why the amount of plastic waste entering the oceans varies from country to country.

.....

.....

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.....[3]

**(c)** Describe the problems caused by plastic waste in the oceans.

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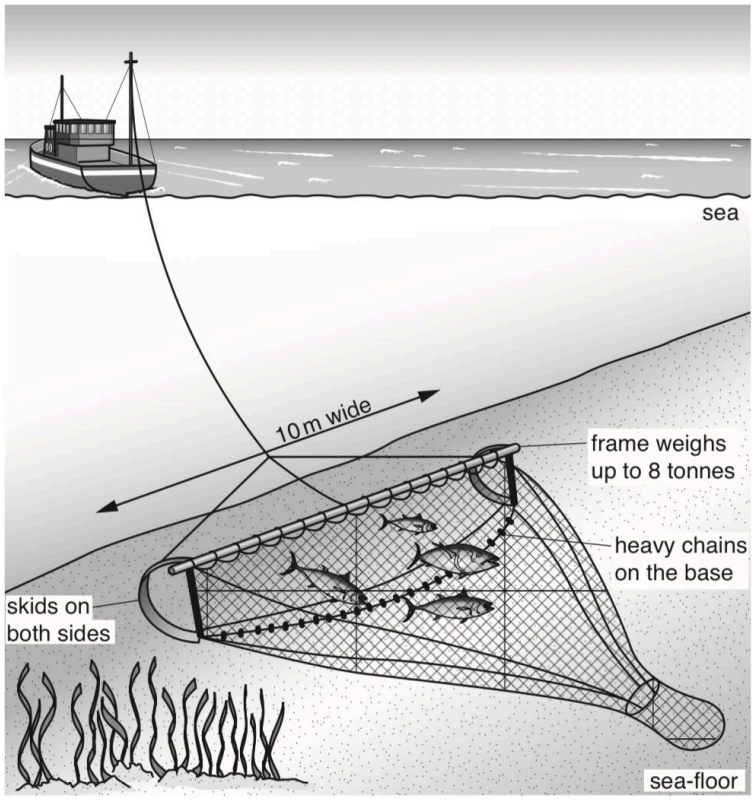
.....[4]

6 **(a)** The diagram shows a trawler and its net (trawl).




not to scale

**(i)** Describe how fish are caught by a trawler.

.....

.....

.....

.....[2]

**(ii)** Describe how trawling can damage the sea-floor.

.....

.....

.....

.....[2]

**(iii)** What is meant by the term *overfishing*?

.....

.....[1]

**(iv)** Explain why overfishing has occurred in many of the world's oceans.

.....

.....

.....

.....

.....

.....[3]

**(v)** Suggest how overfishing can impact a marine food web.

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.....

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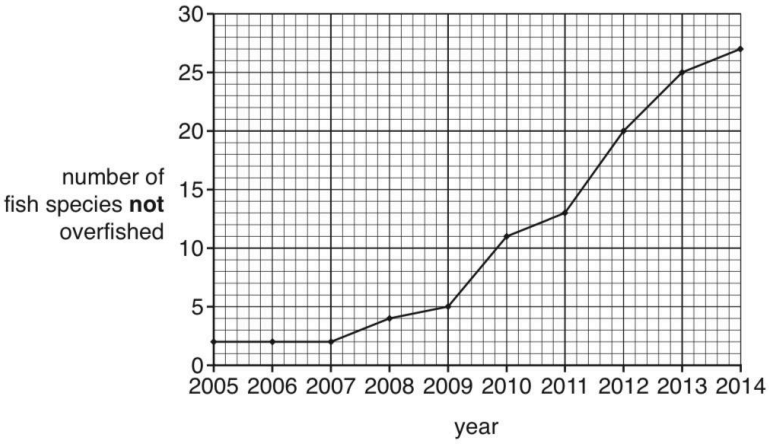
.....[3]

**(b)** The graph shows the number of fish species that are **not** overfished in the north east Atlantic Ocean and North Sea from 2005 to 2014.




**(i)** State the number of fish species that are **not** overfished in 2012.

.....[1]

**(ii)** Describe what the graph shows about the changes in fish species that are **not** overfished from 2005 to 2014.

.....

.....

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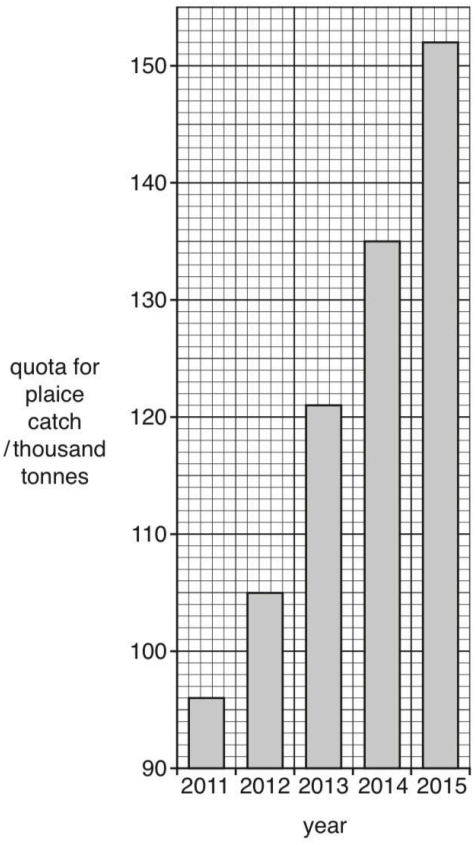
.....[3]

**(c)** The graph shows the quotas for the plaice catch in the north east Atlantic Ocean and North Sea from 2011 to 2015. Plaice are a species of fish.



**(i)** State the quota for the plaice catch in 2015.

..... thousand tonnes [1]

**(ii)** Calculate the increase in the quota for the plaice catch from 2011 to 2015.

Show your working.

..... thousand tonnes [2]

**(iii)** Suggest why governments have increased the quota for the plaice catch since 2011.

.....

.....[1]

**(iv)** Describe **three** ways in which fish stocks can be managed to reduce overfishing, other than by using quotas.

1 .....

.....

2 .....

.....

3 .....

.....
[3]

**(d)** The table shows information about tropical cyclones (hurricanes) in the Atlantic Ocean and Caribbean Sea from 2000 to 2009.

| year | number of cyclones | approximate number of deaths | cost of damage /billion USD |
|---|---|---|---|
| 2000 | 8 | 79 | 1.2 |
| 2001 | 9 | 105 | 7.1 |
| 2002 | 4 | 23 | 2.6 |
| 2003 | 7 | 92 | 4.4 |
| 2004 | 9 | 3100 | 50.0 |
| 2005 | 15 | 2280 | 159.0 |
| 2006 | 5 | 14 | 0.5 |
| 2007 | 6 | 423 | 3.0 |
| 2008 | 8 | 1047 | 42.0 |
| 2009 | 3 | 6 | 77.0 |

**(i)** State the year with the lowest cost of damage.

..... [1]

**(ii)** State the three-year period with the most cyclones.

..... [1]

**(iii)** Calculate the average number of cyclones per year for this ten-year period.

..... [1]

**(iv)** Suggest why some cyclones caused more damage than other cyclones.

.....

.....

.....

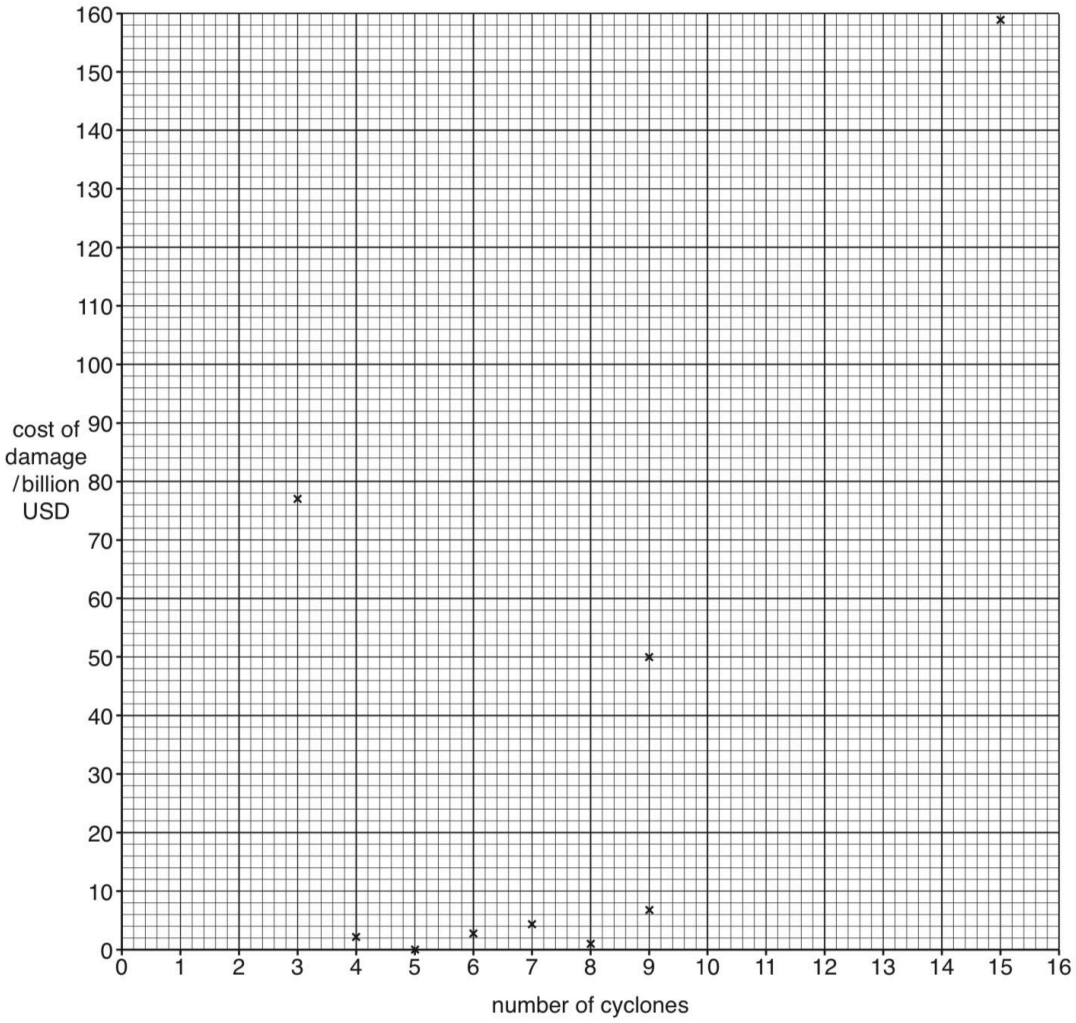
.....

.....

.....[3]

**(v)** The graph shows the number of cyclones and the cost of damage in billion USD.

Complete the graph, by adding the data for 2008 from the table in **(d)**.




[1]

**(vi)** Is there a relationship between the number of cyclones and the cost of damage? Justify your answer.

.....

.....

.....

.....[2]

**(vii)** Describe the causes of cyclones.

.....

.....

.....

.....

.....

.....[3]

**(e)** Is it possible to reduce the pollution in the oceans? Explain your answer.

.....

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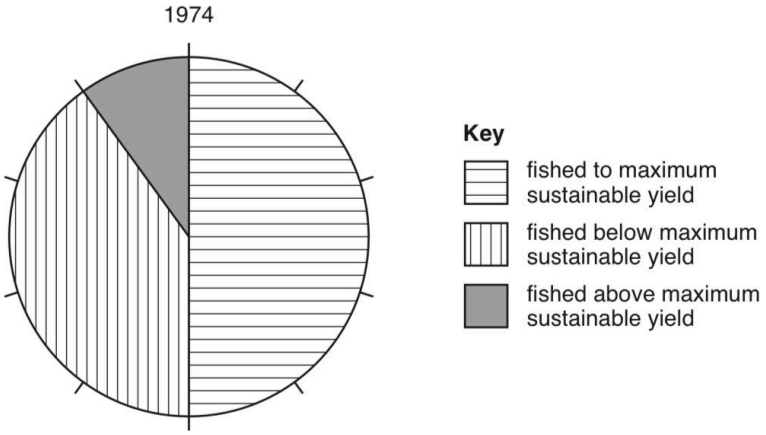
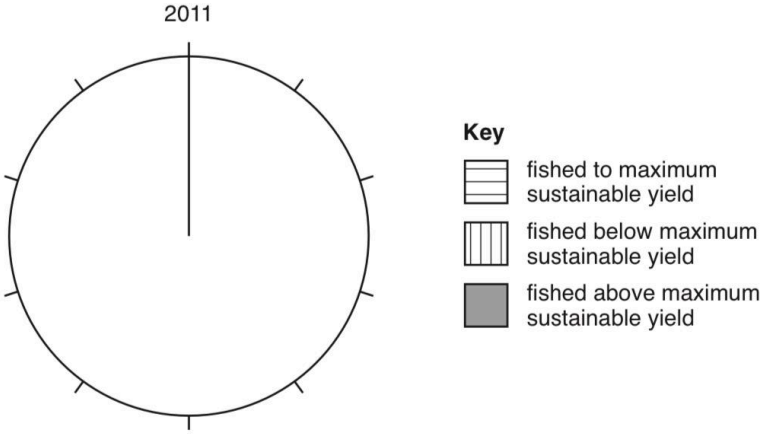
.....[6]

**2** **(a)** The pie graph shows the state of world fisheries in 1974. Maximum sustainable yield means the largest catch of fish that can be caught without reducing future fish stocks.




**(i)** Use the figures in the table to complete the pie graph for 2011. Use the key provided.

| state of world fisheries in 2011 | percentage |
|---|---|
| fished to maximum sustainable yield | 61 |
| fished below maximum sustainable yield | 10 |
| fished above maximum sustainable yield | 29 |




[2]

**(ii)** State the percentage of fish stocks that were **not** fished above the maximum sustainable yield in 1974.

.....[1]

**(iii)** Suggest reasons why the percentage of fish stocks that were fished **above** the maximum sustainable yield increased between 1974 and 2011.

.....

.....

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.....[4]

**(b)** Quotas are one method used to try to keep fishing sustainable.

**(i)** Explain how quotas keep fishing sustainable.

.....

.....

.....

.....[2]

**(ii)** Give **one** reason why quotas can be harmful to fish stocks.

.....

.....[1]

**6** The table shows official data on the world fish catch from 2006 to 2014.

| year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| **wild fish catch / million tonnes** | 90.0 | 90.3 | 89.7 | 89.6 | 88.6 | 90.4 | 89.9 | 88.8 | 90.4 |
| **farmed fish catch / million tonnes** | 47.3 | 49.9 | 52.9 | 55.7 | 59.9 | 63.6 | 67.1 | 71.5 | 75.9 |
| **total fish catch / million tonnes** | 137.3 | 140.2 | 142.6 | 145.3 | 148.5 | 154.0 | ..... | 160.3 | 166.3 |

**(a) (i)** Complete the table by calculating the total fish catch in 2012. [1]

**(ii)** Compare the trends in fish catch from 2006 to 2014.

.....

.....

.....

.....

.....

..... [3]

**(iii)** Suggest **two** reasons for the changes in the farmed fish catch between 2006 and 2014.

1 .....

.....

2 .....

.....

[2]

**(b)** Other than fish farming, describe ways fish stocks in the ocean can be maintained.

.....

.....

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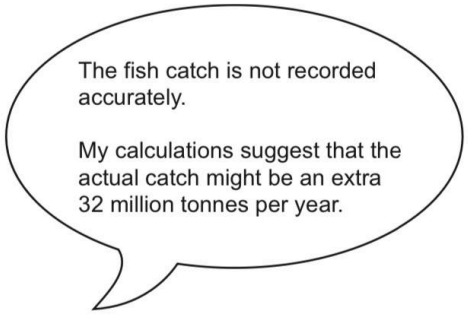
.....

..... [3]

**(c)** A scientist disagrees with the official data provided about the world fish catch.




Suggest **three** reasons why the actual fish catch might be greater than the official data in the table.

1 .....

.....

2 .....

.....

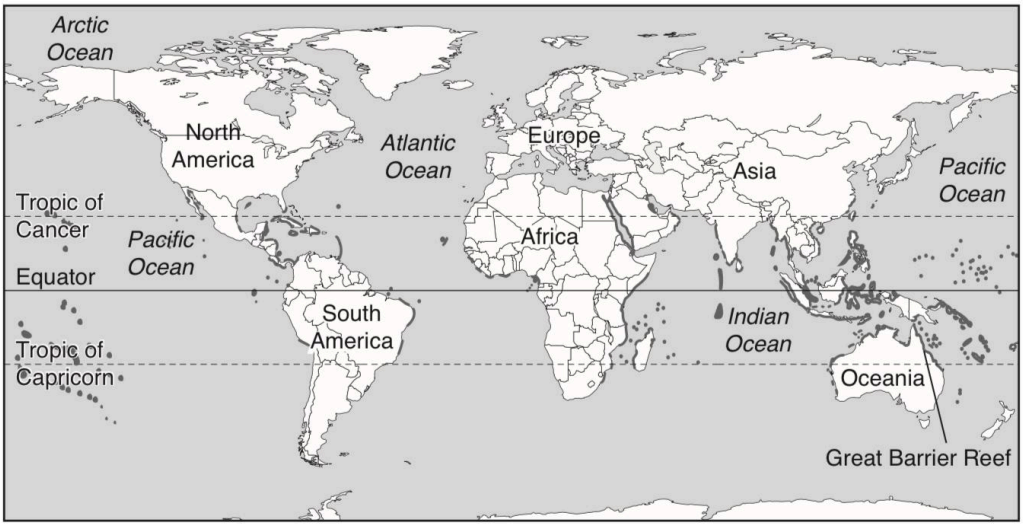
3 .....

.....

[3]

[Total: 12]

**8** The map shows the location of coral reefs.




**Key**

coral reefs

**(a)** Describe the location of the coral reefs.

.....

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.....

..... [3]

**(b)** The Great Barrier Reef is a major coral reef and a popular tourist destination.

Scientists estimate that the living coral has decreased by 50% since 1988.

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

1 .....

.....

2 .....

.....

[2]

**(ii)** In 1988, living coral covered an area of 300 000 $km^2$ on the Great Barrier Reef.

Calculate the current area covered by living coral.

..... $km^2$ [1]

**(c)** Some coral reefs are marine ecological reserves.

Suggest reasons why it is difficult to make coral reefs into marine ecological reserves.

.....

.....

.....

.....

.....

..... [3]

[Total: 9]

**2** The photograph shows mesh tanks in the sea where fish are farmed.


**(a)** Suggest the purpose of the mesh tanks shown in the photograph.

.....

..... [1]

**(b)** Fish farming can help to reduce the number of wild fish caught.

State **two** other strategies to reduce overfishing of wild fish.

1 .....

.....

2 .....

.....
[2]

**(c)** Suggest **two** negative effects of fish farming on the environment.

1 .....

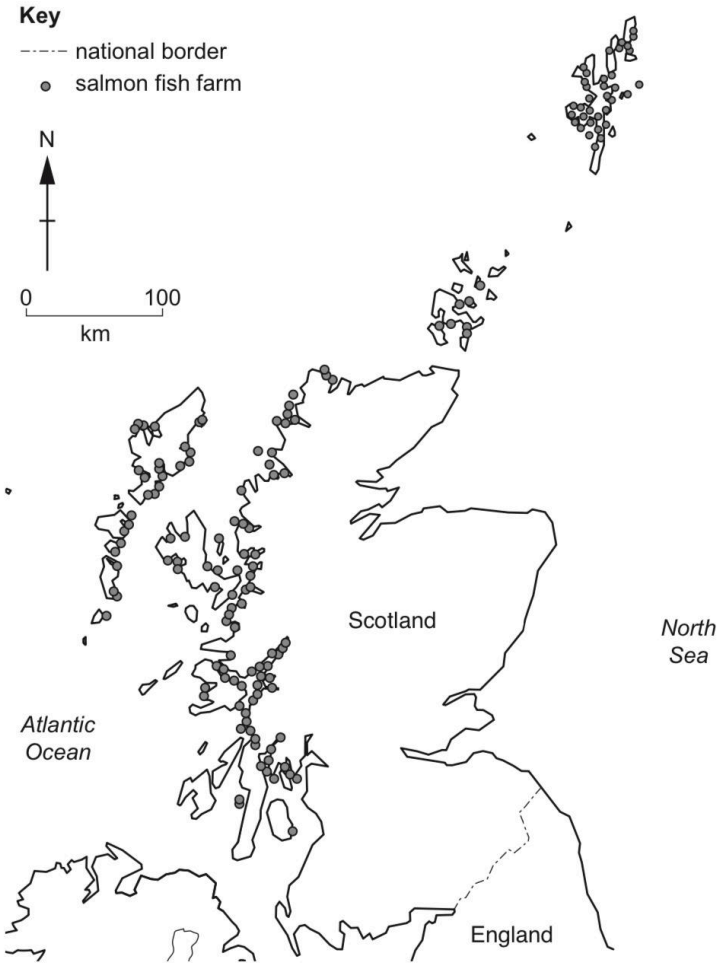
.....

2 .....

.....
[2]

[Total: 5]

**5** The map shows the locations of salmon fish farms in Scotland.




**(a)** Describe the distribution of salmon fish farms shown on the map.

.....

.....

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.....

..... [3]

**(b)** The article describes changes in salmon fish farming in Scotland.

## Salmon fish farmers reduce the use of pesticides

Sea lice are parasites that feed on the bodies of living salmon. Salmon fish farmers in Scotland want to reduce the amount of pesticides used to control sea lice.

Experiments to replace these pesticides with wrasse, small fish that eat sea lice, have been successful in controlling the sea lice.

Wrasse live in the sea around England. They are caught and transported to the salmon fish farms in Scotland.

Scientists are worried that there are now fewer wrasse in the sea around England. They think this decrease is due to the demand for wrasse in salmon fish farms.

Over the last 10 years, it is estimated that the catch of wrasse has increased from 2.0 million to 22 million fish per year.

**(i)** Suggest reasons why the use of pesticides on fish farms may be harmful to the environment.

.....

.....

.....

..... [2]

**(ii)** Calculate the percentage increase in the yearly number of wrasse caught over the last 10 years.

..... % [2]

**(iii)** Suggest reasons why some scientists think that using wrasse to control sea lice is **not** sustainable.

.....

.....

.....

..... [2]

**(iv)** Explain why fish farming is a more sustainable method of food supply than catching fish from the oceans.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 13]

**2** **(a)** The photograph shows bycatch on a prawn-fishing boat.


Explain what the fisherman is doing with the bycatch in the photograph.

.....

.....

.....

..... [2]

**(b)** **(i)** Describe the environmental impacts of overfishing.

.....

.....

.....

..... [2]

**(ii)** State **two** strategies that can be used to reduce overfishing.

1 .....

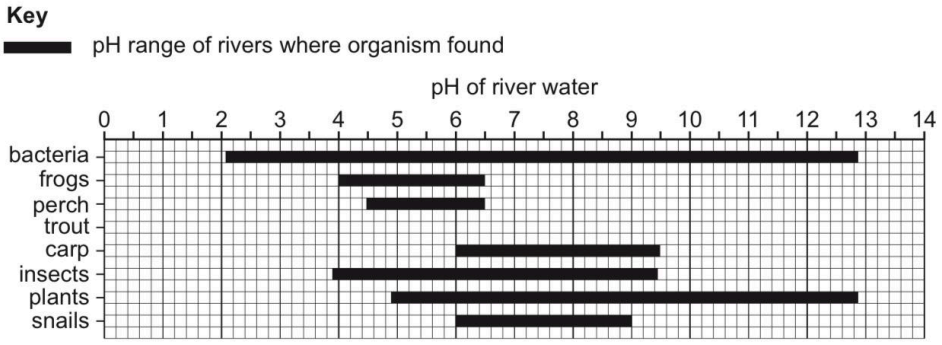
2 .....

[2]

[Total: 6]

**5** A scientist investigates the pH range of rivers that aquatic organisms can live in.

The results are shown in the diagram.




**(a) (i)** Trout can live in rivers with a pH range of 5.0 to 6.5.

Plot the data for trout on the diagram. [1]

**(ii)** State which organism can live in rivers with the greatest pH range.

..... [1]

**(iii)** Suggest what would happen to the populations of aquatic organisms in a river if the pH changes from 6.0 to 5.0.

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..... [4]

**(b) (i)** Acid rain is a cause of pH change in rivers and lakes.

Explain how acid rain is formed.

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.....

..... [5]

**(ii)** Describe strategies a country can use to reduce its contribution to the problem of acid rain.

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.....

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..... [3]

[Total: 14]