Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0739109091

MARINE SCIENCE **0697/13**

Paper 1 Theory and Data Handling **May/June 2024**

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 **16** pages. Any blank pages are indicated.

1 Fig. 1.1 shows a leatherback turtle during part of its life cycle.

Fig. 1.1

(a) (i) Explain why this turtle migrates to the same sandy beach every three years.

.....

.....

.....

..... [2]

(ii) State **two** methods the turtle can use to locate this beach.

1 .....

2 .....
[2]

(iii) The sandy beach is a popular area for tourists to visit.

Suggest **two** ways the tourists' activities can affect the turtles.

1 .....

.....

2 .....

.....
[2]

(iv) The leatherback turtle is an endangered species.
Some countries have Marine Protected Areas (MPAs) to help conservation of leatherback turtles.

Explain what is meant by the term Marine Protected Area.

.....

..... [1]

(b) Lugworms are also found on sandy shores.

State **two** biotic factors, other than human impact, that will affect the population growth of lugworms found on sandy shores.

1 .....

2 .....
[2]

[Total: 9]

2 **(a)** Draw one line to match each term to its description.
You should draw **four** lines in total.

term	description
ecosystem	the community and its environment interacting together
habitat	a group of organisms of one species living in the same area at the same time
species	a group of organisms that can reproduce fertile offspring
environment	the external biotic and abiotic surroundings of an organism
	all the populations of different species in one area
	the area where an organism lives and interacts with its environment and other organisms

[4]

(b) Fig. 2.1 shows the concentration of phytoplankton in surface waters in one area of the world.

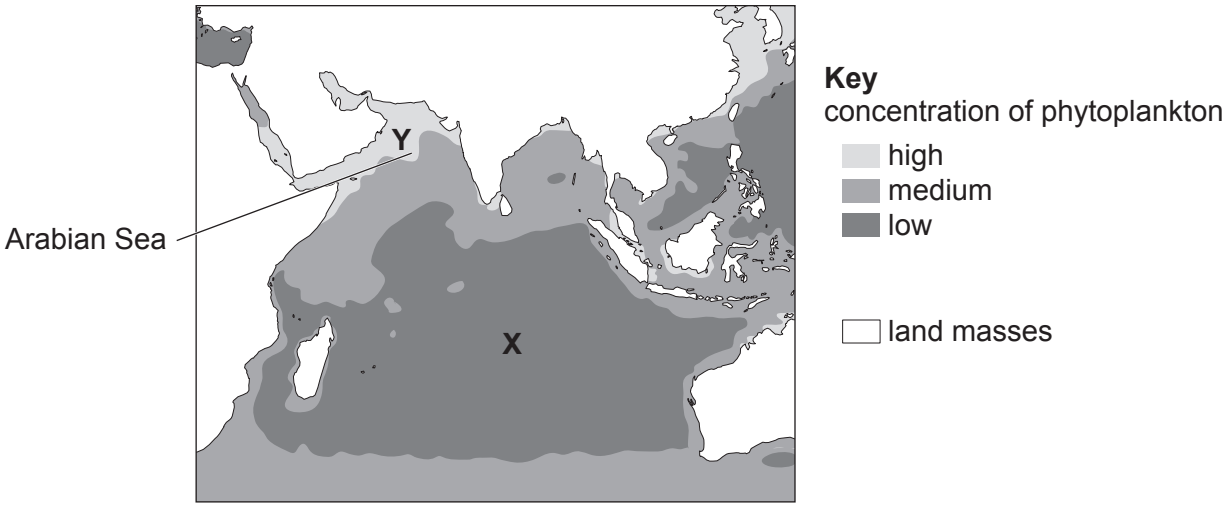

Fig. 2.1

(i) On Fig. 2.1, **X** shows an area within an ocean.

State the name of this ocean.

..... [1]

(ii) The Arabian Sea is found within this ocean.

Describe how a sea is different to an ocean.

.....

.....

.....

..... [2]

(iii) Explain why the productivity is higher in area **Y** than in area **X**.

.....

.....

.....

..... [2]

[Total: 9]

3 Fig. 3.1 shows a bacterial cell.

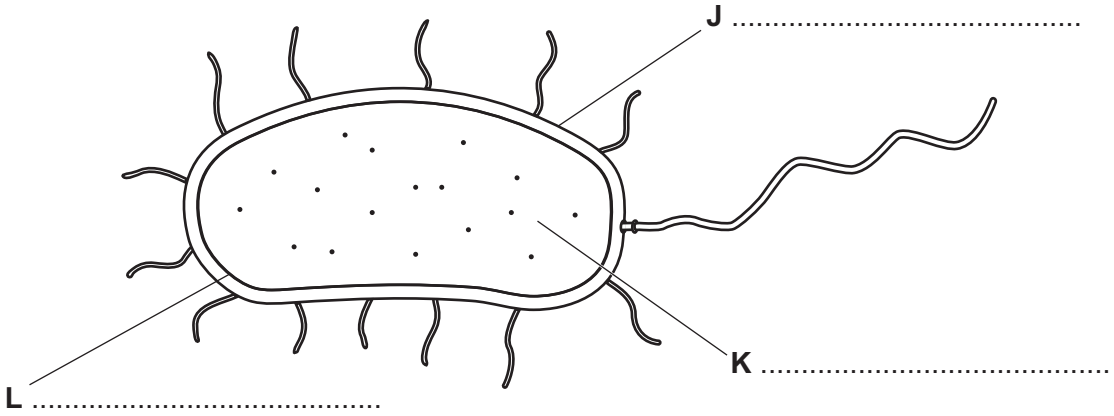

Fig. 3.1

(a) (i) Identify the structures labelled **J**, **K** and **L** in Fig. 3.1.
Write your answers on Fig. 3.1.

[3]

(ii) State the function of the structure labelled **L**.

.....

..... [1]

(iii) Name **one** structure found **only** in plant cells that is **not** found in the bacterial cell in Fig. 3.1.

..... [1]

(iv) Name **one** structure found in animal **and** plant cells that is **not** found in the bacterial cell in Fig. 3.1.

..... [1]

(b) (i) Nitrogen is an essential element for organisms.

Describe the role of nitrogen in bacterial cells.

.....

..... [2]

(ii) Outline the function of bacteria in the nitrogen cycle.

.....

.....

.....

..... [2]

[Total: 10]

4 Water is constantly cycled around the Earth in the water cycle.

(a) (i) Name the energy source that drives the water cycle.

..... [1]

(ii) Fig. 4.1 shows the arrangement of water molecules in different states.

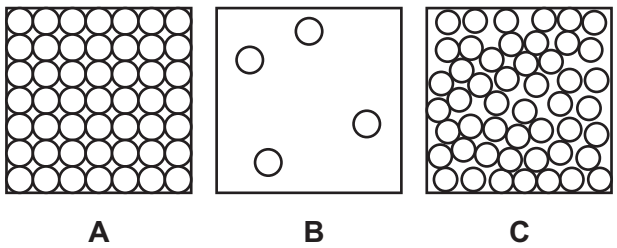

Fig. 4.1

State the letter in Fig. 4.1 which shows the arrangement of molecules in water vapour.

..... [1]

(iii) Describe the changes that occur when water vapour condenses.

.....

.....

.....

..... [2]

(b) Explain why increased burning of fossil fuels leads to increased precipitation in some areas of the world.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 8]

5 Fig. 5.1 shows a cross-section of a coral polyp.

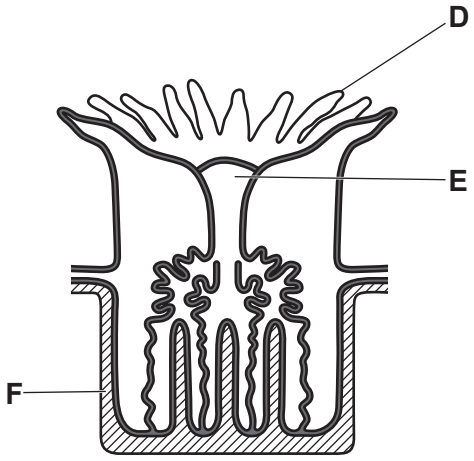

Fig. 5.1

(a) Complete Table 5.1 to state the names and functions of features **D**, **E** and **F** in Fig. 5.1.

Table 5.1

feature	name	function
D	.....	.....
E	.....	.....
F	calcium carbonate skeleton	.....

[2]

(b) Coral polyps can reproduce both sexually and asexually.

Describe the differences between sexual reproduction and asexual reproduction in coral polyps.

.....

.....

.....

.....

.....

..... [3]

(c) Table 5.2 shows information about two different species of coral.

Table 5.2

	species R	**species S**
number of zooxanthellae per mm^2 of surface	1.8×10^5	4.3×10^6
mean depth species is found / m	25	10
percentage of coral nutrition absorbed from zooxanthellae	61%	85%

(i) Calculate the difference in the number of zooxanthellae, per mm^2 of surface, between species **R** and species **S**.

Show your working.

..... per mm^2
[2]

(ii) Explain why the species found at greater depth has fewer zooxanthellae.

.....

.....

.....

..... [2]

(iii) The percentage of coral nutrition absorbed from zooxanthellae in species **S** at a depth of 10 m is decreased in certain conditions.

Explain a reason for this decrease.

.....

.....

.....

..... [2]

[Total: 11]

6 Fig. 6.1 shows the total fish catch in a local fishery since 1980.

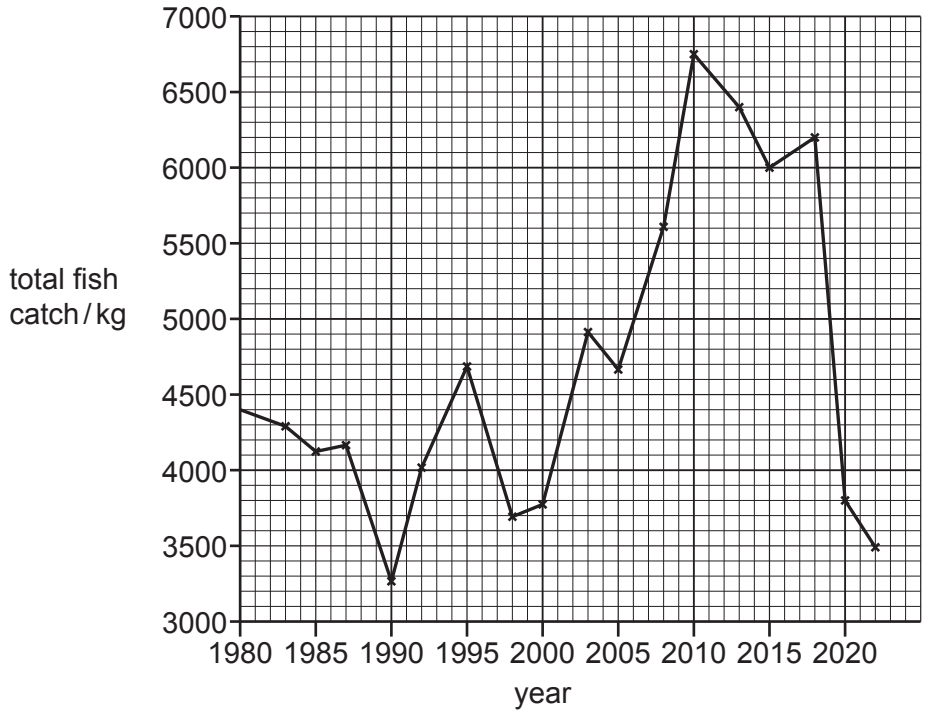

Fig. 6.1

(a) (i) Calculate the percentage change in total fish catch between 1990 and 2010.

Show your working.

..... %
[3]

(ii) Fish aggregating devices (FADs) have never been used in this fishery.

Suggest **two** reasons for the change in total fish catch between 1990 and 2010.

1 .....

.....

2 .....

.....
[2]

(b) The catch in the fishery shown in Fig. 6.1 has decreased over the last ten years.

The local fishers aim to increase the fish catch in their local waters.
They place a FAD two kilometres offshore.

(i) Explain how a FAD may lead to an increase in fish catch.

.....

.....

.....

.....

.....

..... [3]

(ii) Explain **two** other strategies the fishers can use to improve the catch in the fishery in the long term.

1 .....

.....

.....

2 .....

.....

.....

[4]

[Total: 12]

7 Fig. 7.1 shows a line graph of temperature change with depth for a temperate region of the ocean.

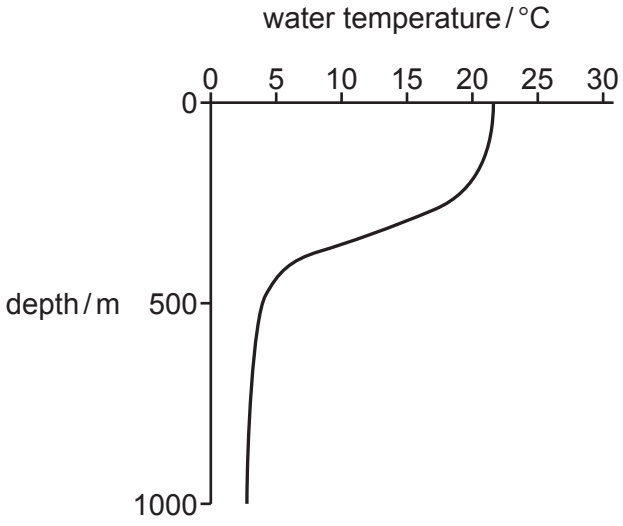

Fig. 7.1

(a) (i) On Fig. 7.1, sketch a temperature–depth curve for water in a tropical region of the ocean. [3]

(ii) The Mariana Trench is the deepest point in the World Ocean.

State the maximum depth of the Mariana Trench.

..... m [1]

(iii) Describe the conditions at the bottom of the Mariana Trench.

.....

.....

..... [2]

(b) (i) Organisms in the Mariana Trench have adaptations to living there.
Some organisms have very enlarged eyes while others have no eyes.

Suggest why both adaptations exist in the Mariana Trench.

.....

.....

.....

..... [2]

(ii) Explain why some fish in the Mariana Trench have gelatinous bodies.

.....

..... [1]

[Total: 9]

Question 8 starts on the next page.

8 The world's oceans provide sustainable resources which are of benefit to the human population.

(a) Describe how a resource is used sustainably.

.....

.....

.....

.....

.....

..... [3]

(b) Fig. 8.1 shows a fish aquaculture system.

Fig. 8.1

(i) Outline the method of producing fish, such as grouper, by aquaculture.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

(ii) Some aquaculture systems cause eutrophication in the water.

Explain why this is harmful to the fish in the aquaculture system.

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

BLANK PAGE