



# Cambridge O Level

CANDIDATE  
NAME

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CENTRE  
NUMBER

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**MARINE SCIENCE**

**5180/01**

Paper 1 Structured

**October/November 2022**

**1 hour 30 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 world map.

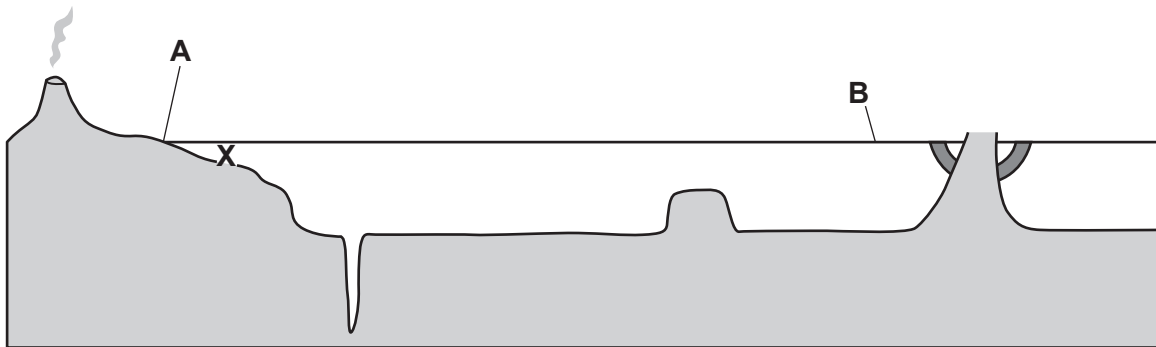


Fig. 1.1

(a) Label the Indian Ocean and the Pacific Ocean on Fig. 1.1.

[2]

(b) Fig. 1.2 shows a cross-section of an ocean.



Not to scale

Fig. 1.2

- (i) Draw label lines on Fig. 1.2 to identify each of the following features:
- continental slope
  - abyssal plain
  - coral atoll.

[3]

(ii) Point **A** on Fig. 1.2 shows where a river enters the ocean.

Explain the effect of the river on the salinity of the sea water at point **A** compared to the salinity of the sea water at point **B**.

.....

.....

.....

..... [2]

(iii) State **one** factor that changes the salinity of the water at point **B** in Fig. 1.2.

..... [1]

(c) Fisheries resources at **X** are higher than in the open ocean.

Suggest reasons for this.

.....  
.....  
.....  
..... [2]

[Total: 10]

2 Fig. 2.1 shows a sea cucumber.

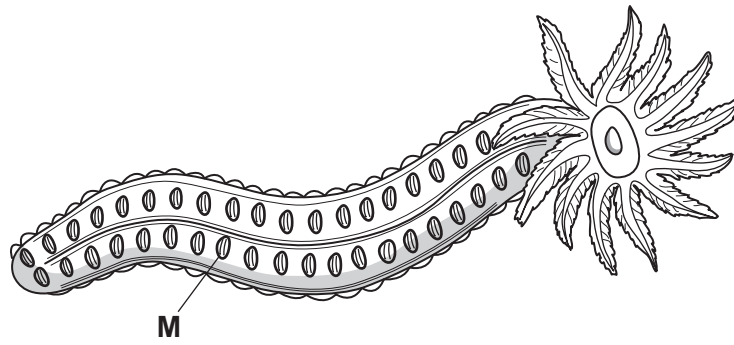


Fig. 2.1

(a) (i) State the group that sea cucumbers belong to.

..... [1]

(ii) State the function of feature **M**.

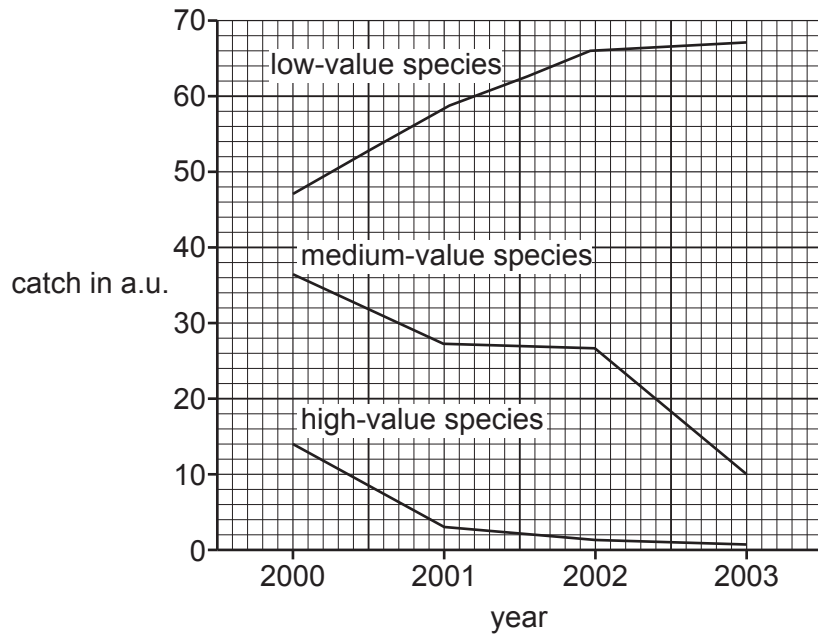
..... [1]

(iii) Describe the reproduction of sea cucumbers.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

(b) Sea cucumbers can be a valuable fisheries resource.

Fig. 2.2 shows the catch in arbitrary units (a.u.) of different value sea cucumbers for a fishery between 2000 and 2003.



**Fig. 2.2**

(i) Use the graph in Fig. 2.2 to calculate the reduction in catch of high value species between 2000 and 2003.

..... a.u. [1]

(ii) Use Fig. 2.2 to describe the condition of this fishery in 2003.

Support your answer with information from the graph.

.....  
 .....  
 .....  
 ..... [2]

(iii) Minimum catch size for a species is one management practice used for a fishery. Suggest **two other** management practices that should be used for this fishery **and** explain the benefit of each.

1 .....

.....

.....

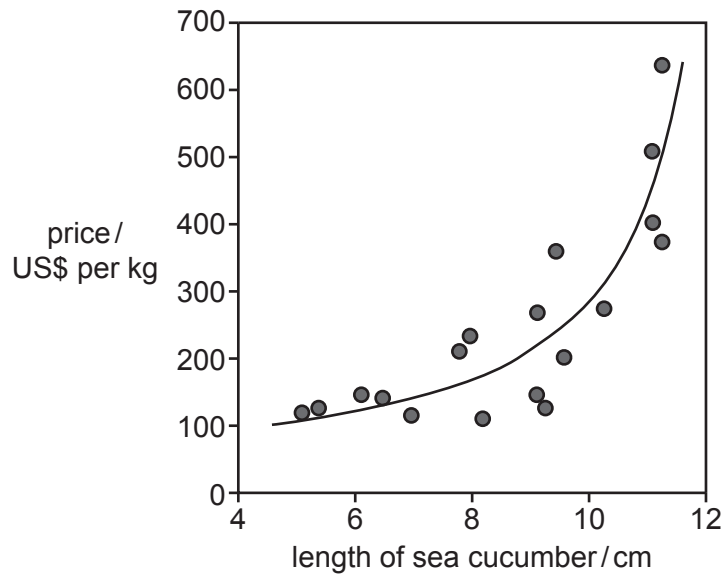
2 .....

.....

.....

[4]

(c) Fig. 2.3 shows how the price of one species of sea cucumber varies by size.



**Fig. 2.3**

(i) State the relationship between the length and the price of this species of sea cucumber.

.....

..... [2]

- (ii) Compare the long-term impact on the population of a minimum catch size limit of 7 cm to a minimum catch size limit of 10 cm.

.....

.....

.....

.....

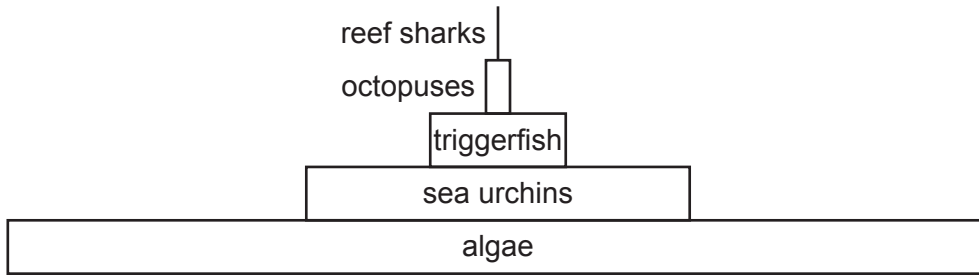
.....

.....

..... [3]

[Total: 17]

3 Fig. 3.1 shows a pyramid of biomass for a food chain.



**Fig. 3.1**

(a) (i) State the number of trophic levels in this food chain. .... [1]

(ii) State the name of the organism on the fourth trophic level.  
 ..... [1]

(iii) State the names of **all** carnivores in this food chain.  
 .....  
 ..... [1]

(iv) Explain why the biomass of algae is not the same as the biomass of sea urchins.  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [3]

(b) Humans harvest sea urchins from this food chain.

Explain the impact harvesting of sea urchins has on populations of algae and triggerfish.

algae .....  
 .....  
 triggerfish .....  
 .....

[2]



The harvested sea urchins are eaten to provide protein.

(c) (i) Explain the function of protein in the diet.

.....  
..... [1]

(ii) State the name of the smaller unit that proteins are made from.

..... [1]

(iii) State the name of **two** other essential components of a balanced diet.

.....  
..... [1]

[Total: 11]

4 (a) Bait fish are used in pole and line fishing.

(i) Outline how bait fish are caught.

.....  
.....  
.....  
.....  
.....  
..... [3]

(ii) Describe how bait fish are kept after collection.

.....  
.....  
.....  
..... [2]

(iii) Describe how bait fish are used for pole and line fishing for tuna.

.....  
.....  
.....  
.....  
..... [3]

(b) Describe how tuna are handled after capture to reduce spoilage.

.....  
.....  
.....  
..... [2]

(c) State **three** methods of preservation used for tuna.

1 .....

2 .....

3 .....

[3]

(d) Preservation reduces rancidity.

Explain what is meant by rancidity.

.....

.....

.....

..... [2]

[Total: 15]

5 Table 5.1 shows features that may be present in wet or dry monsoons.

(a) Complete Table 5.1 to describe typical conditions during a wet and a dry monsoon.

Use the four words given in the box. Each word may be used once, more than once or not at all.

low      offshore      onshore      high

**Table 5.1**

feature	wet monsoon	dry monsoon
wind direction	.....	.....
temperature	.....	.....
rainfall	.....	.....

[3]

(b) Wet monsoons affect the biodiversity of species.

Explain the meaning of biodiversity.

.....

.....

.....

..... [2]

[Total: 5]

6 Navigational aids help fishermen to travel safely on the ocean.

Describe the use of each navigational aid.

(a) compass and chart

.....  
.....  
.....  
.....  
.....  
..... [3]

(b) buoys

.....  
.....  
.....  
..... [2]

(c) radar

.....  
.....  
.....  
..... [2]

[Total: 7]

7 (a) Explain why coral reefs are only located in warm, clear waters.

.....  
.....  
.....  
..... [2]

(b) Describe the effect of coral mining on coral reefs **and** the fisheries they support.

.....  
.....  
.....  
..... [3]

(c) Describe the benefits of artificial reefs to the marine ecosystem.

.....  
.....  
.....  
..... [2]

[Total: 7]

8 Table 8.1 shows a partly completed classification of the giant clam, *Tridacna gigas*.

**Table 8.1**

kingdom	.....
.....	mollusca
class	bivalve
genus	.....
species	.....

(a) Complete Table 8.1 by adding the correct names into the table. [4]

(b) Suggest **two** reasons the giant clam has become an endangered species.

1 .....

2 .....

[2]

(c) State the full names of **two** international organisations involved in fisheries management or conservation of marine species.

1 .....

2 .....

[2]

[Total: 8]

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