



Cambridge IGCSE™

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MARINE SCIENCE

0697/02

Paper 2

For examination from 2020

SPECIMEN PAPER

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 60.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages. Blank pages are indicated.

Section A

Answer **both** questions in this section.

Write your answers in the spaces provided.

- 1 A Marine Protected Area (MPA) was set up off the coast of South Africa in 1990.

The total catch of seabream from areas of ocean close to the MPA were recorded over a period of ten years. The results are shown in Table 1.1.

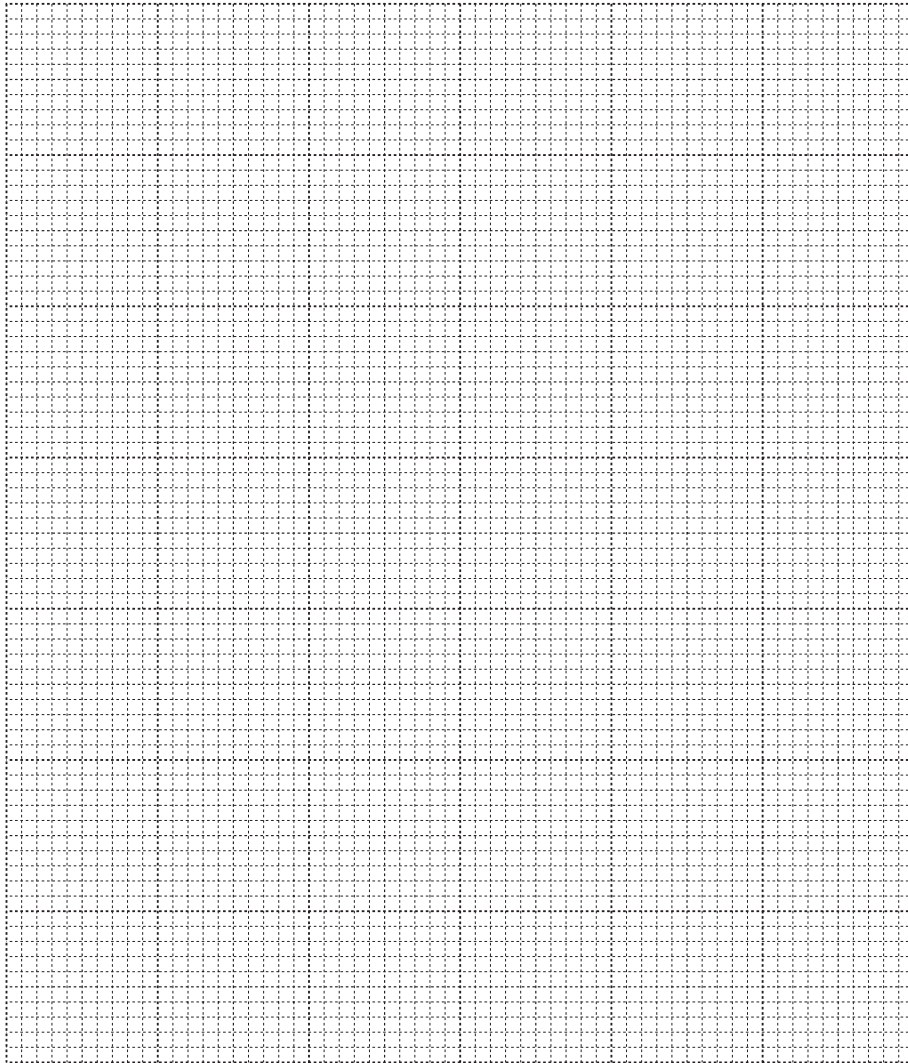
Table 1.1

year	seabream catch / kg
1990	200
1992	500
1994	800
1996	1200
1998	1300
2000	1350

- (a) (i) State what is meant by the term *Marine Protected Area*.

.....
 [1]

(ii) Draw a bar chart of the data in Table 1.1 on the grid provided.



[4]

(b) (i) Within which two-year period was there the largest change in catch?

..... and [1]

(ii) Calculate the change in seabream catch between 1990 and 2000.

Show your working and state your units.

..... [2]

(iii) Describe the change in seabream catch between 1990 and 2000.

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

(c) Suggest **three** reasons for the change in seabream catch in areas close to the MPA.

1
.....
2
.....
3
..... [3]

(d) Suggest one advantage **and** one disadvantage of MPAs to fishermen.

advantage
.....
disadvantage
..... [2]

[Total: 15]

2 Fig. 2.1 shows a marine food chain and the total biomass at each trophic level.

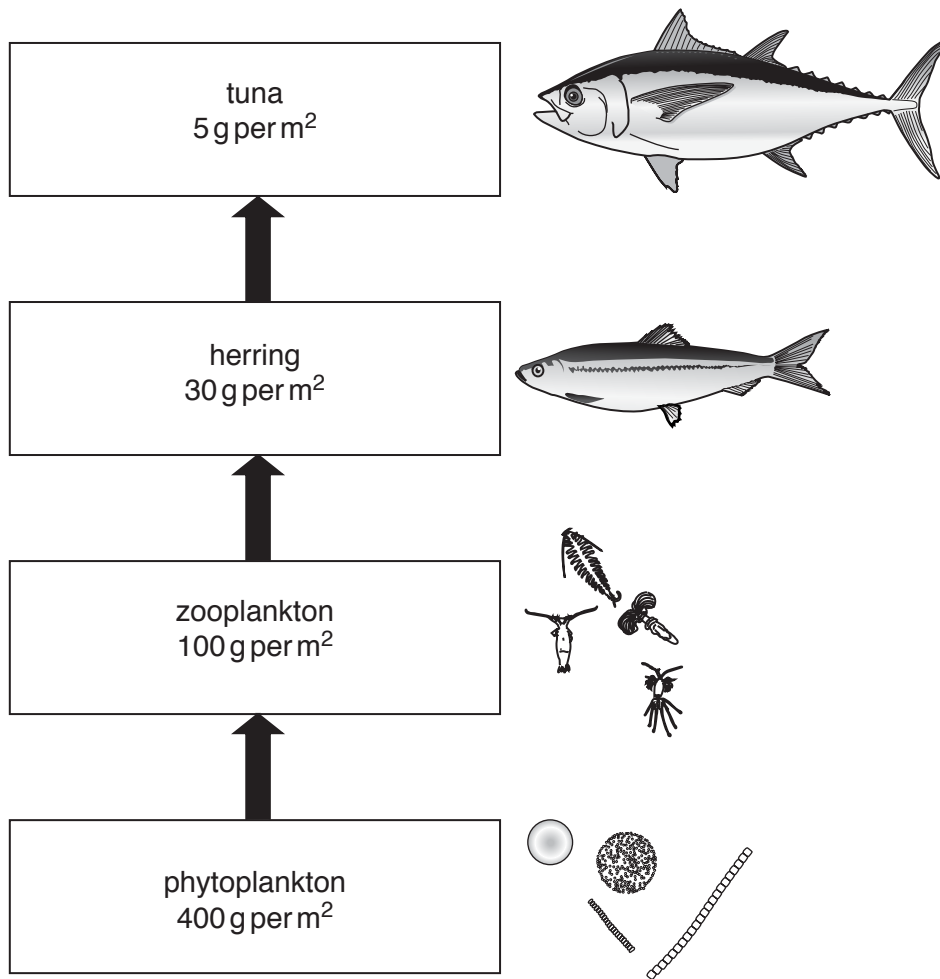


Fig. 2.1

(a) (i) Use Fig. 2.1 to name:

a producer

a carnivore at trophic level three

[2]

(ii) Predict the effect of overfishing of tuna on the population of zooplankton. Explain the reason for this.

prediction

.....

explanation

.....

.....

.....

[3]

(iii) Draw a labelled pyramid of biomass for this food chain.

[2]

(b) Table 2.1 shows the total energy in each trophic level each year.

Table 2.1

trophic level	total energy / kJ per m ² per year
phytoplankton	250 000
zooplankton	23 000
herring	1800
tuna	150

(i) The percentage of energy that is lost during the transfer between herring and tuna can be calculated using the following equation.

$$\text{percentage of energy lost} = \left(\frac{\text{energy in herring} - \text{energy in tuna}}{\text{energy in herring}} \right) \times 100$$

Calculate the percentage of energy that is lost during the transfer between herring and tuna.

Show your working.

.....%

[2]

(ii) Explain why the percentage of energy lost between herring and tuna is high.

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..... [3]

(c) Inorganic nutrients such as nitrates and phosphates are also passed along the food chain.

Suggest why overfishing of tuna and herring would reduce the quantity of nutrients available to the rest of the food chain.

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..... [3]

[Total: 15]

Section B

Answer **both** questions in this section.

Write your answers in the spaces provided.

3 (a) (i) Boats are built from a range of materials.

Name one of these materials **and** describe how its properties make it suitable for building boats.

material

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[3]

(ii) Describe the features of a typical fishing boat.

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[6]

(b) Describe each of the following fishing methods **and** explain their environmental impacts.

(i) pole-and-line fishing

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..... [3]

(ii) pelagic long-lining

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..... [3]

[Total: 15]

4 (a) (i) State what is meant by the term *extensive aquaculture*.

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..... [2]

(ii) Describe the possible environmental impacts of extensive aquaculture.

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..... [5]

