Cambridge Assessment International Education

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CANDIDATE NAME

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1283456911

MARINE SCIENCE **0697/13**

Paper 1 Theory and Data Handling **October/November 2025**

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 white marlin fish.

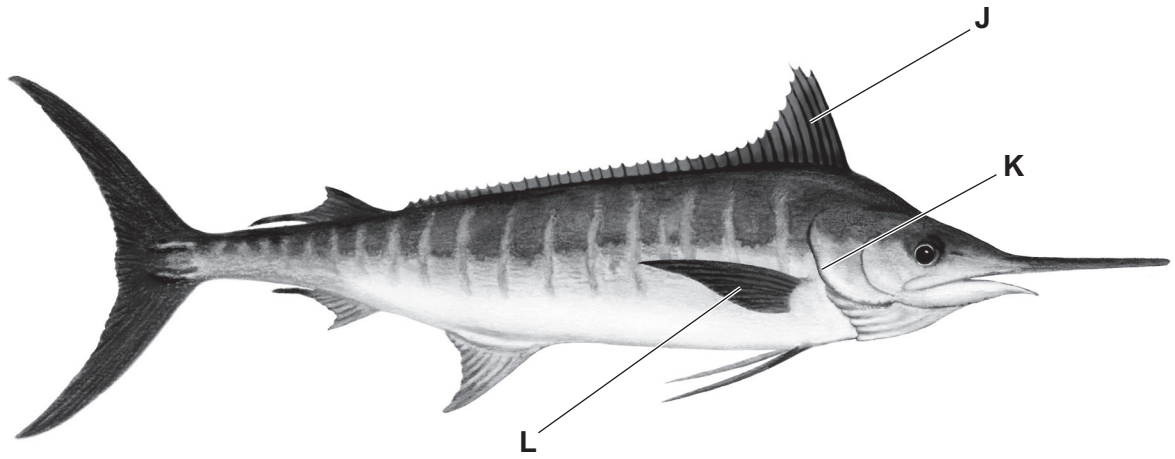

Fig. 1.1

(a) (i) Name the features labelled **J**, **K** and **L**.

J .....

K .....

L .....

[3]

(ii) State the function of the feature labelled **K**.

.....

..... [1]

(b) White marlin fish are in the highest trophic level because they are top predators.

(i) Define the term predator.

.....

..... [1]

(ii) The white marlin fish in Fig. 1.1 is counter-shaded.

Suggest a reason for the counter-shading.

.....

..... [1]

(c) To monitor migration of species, scientists attach GPS trackers to some white marlin fish.

Fig. 1.2 shows the migration patterns of tracked white marlin fish between area **X** and area **Y**.

Fig. 1.2

(i) Suggest **two** methods the white marlin fish use to migrate between area **X** and area **Y**.

1 .....

2 .....
[2]

(ii) The white marlin fish migrate from area **Y** to area **X** in the summer months (from May). Productivity in area **Y** is higher than in area **X** in the summer.

Suggest **one** reason for the white marlin fish to migrate north in the summer.

.....

..... [1]

(d) Some plankton species undertake daily vertical migration.

Explain why organisms undertake daily vertical migration.

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.....

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..... [2]

[Total: 11]

2 Oil is found in the Earth's crust. The oil is extracted and shipped around the world in oil tankers.

(a) State the name of the standards modern oil tankers must be built to.

.....

..... [1]

(b) (i) A scientist measures the mass and volume of a sample of extracted oil.

The sample has a volume of 560 cm^3 and a mass of 487 g.

Calculate the density of the sample of oil to 2 decimal places.
Include the units.
Show your working.

..... [3]

(ii) An oil tanker carrying extracted oil crashed onto rocks near a shore and released oil.
A sample of the oil from the spill has a lower density than sea water.

Explain the impacts of the oil spill on the nearby marine ecosystems.

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..... [5]

(iii) State **two** strategies to help contain and clear up the oil spill.

1 .....

2 .....

[2]

[Total: 11]

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3 **(a)** Mangrove forest ecosystems are often found in estuarine areas.

(i) Explain the changes in salinity of the water in an estuary during a tidal cycle.

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.....

.....

..... [2]

(ii) Explain how **two** adaptations of mangrove trees allow them to live in estuaries.

1 .....

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.....

.....

2 .....

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.....

[4]

(b) The number of tourists visiting mangrove forest ecosystems is increasing.

Suggest how ecotourism can help in the conservation of mangrove forest ecosystems.

.....

.....

.....

..... [2]

(c) The area covered by mangrove forests has decreased over the last 40 years. Some of this loss has been caused by the development of tourist resorts.

(i) Suggest **two** other reasons for this decrease in mangrove forests.

1 .....

.....

2 .....

.....

[2]

(ii) Suggest **two** effects of the decrease of mangrove forests on local human communities.

1 .....

.....

2 .....

.....

[2]

(d) Some mangrove forest ecosystems are starting to increase in size again.

Some communities are helping to restore mangrove forest ecosystems using aquaculture.

Explain how aquaculture can help restore mangrove forest ecosystems.

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..... [2]

[Total: 14]

4 Fig. 4.1 shows a food web from a coral reef.

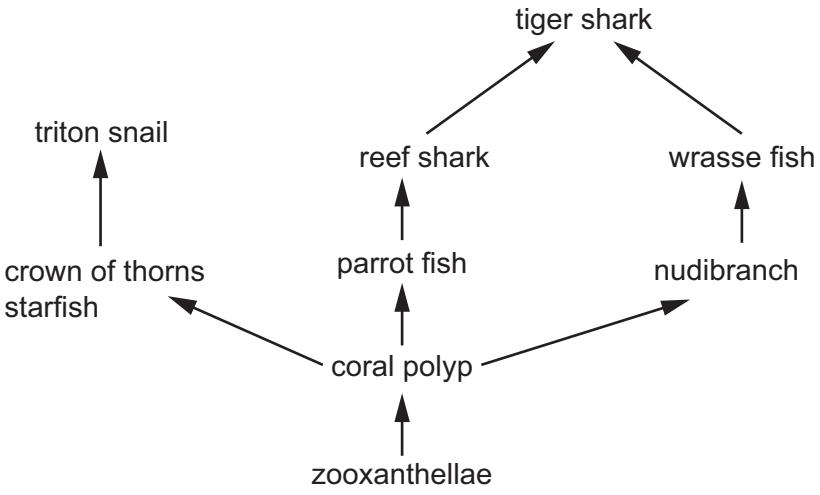

Fig. 4.1

(a) (i) State the source of energy for this food chain.

..... [1]

(ii) State the name of a tertiary consumer from Fig. 4.1.

..... [1]

(iii) Explain the effect harvesting triton snails has on the coral polyp population.

.....

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..... [2]

(b) Fig. 4.2 shows a nudibranch.

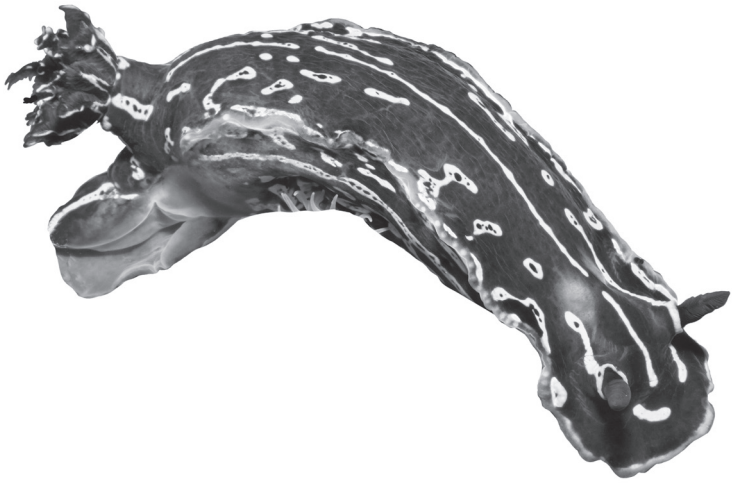

Fig. 4.2

Nudibranchs, limpets and mussels are all types of mollusc.

State **one** feature that limpets and mussels have that is absent in nudibranchs.

.....

..... [1]

(c) Describe **one** adaptation of parrot fish for eating coral polyps.

.....

..... [1]

(d) Explain how **two named** abiotic factors affect the distribution of coral polyps in the ocean.

1 .....

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2 .....

.....

[4]

[Total: 10]

5 **(a)** Table 5.1 names some photosynthetic organisms.

Table 5.1

photosynthetic organism	kingdom	feature
diatoms	.....	silica skeleton
seagrass	.....	.....
dinoflagellates	.....	.....
macroalgae	.....	.....

In Table 5.1 one feature has been given.

Complete Table 5.1 by stating the name of the kingdom each photosynthetic organism belongs to.

State **one** different feature for each type of organism.

[4]

(b) Jellyfish are one type of zooplankton.

(i) Explain why jellyfish are zooplankton.

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.....

..... [2]

(ii) Many jellyfish live in the twilight zone.

Describe **two** conditions found in the twilight zone.

1 .....

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2 .....

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[2]

(iii) Jellyfish reproduce both asexually and sexually.

Describe the differences between asexual and sexual reproduction.

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..... [3]

(c) Complete the paragraph by adding **one** word to each space.

Adult leatherback turtles feed on jellyfish at sea for 15–25 years to reach maturity. Females return to a ..... shore to excavate a ..... for their eggs. They return several times at .....-day intervals. The ..... of the eggs during incubation determines the sex of the offspring. The eggs hatch after ..... days.

[5]

[Total: 16]

6 Species richness is the number of different species found in a habitat. Marine Protected Areas (MPAs) are one method countries use to maintain or improve species richness. Fishing within the MPAs is banned.

A scientist looked at 87 MPAs and found species richness had increased in all of them compared to nearby fished areas.

(a) Suggest why it is important to humans to maintain species richness.

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..... [2]

(b) The scientist found that inside the MPAs there was an increase in species richness.

- There was a 100% increase in species richness for sharks.
- There was a 36% increase in species richness for other large fish.

(i) Suggest **two** reasons the species richness for sharks had increased the most.

1 .....

.....

2 .....

.....

[2]

(ii) The greatest species richness was found in MPAs that were large in size and over 10 years old.

Suggest why species richness increased in large MPAs over 10 years old.

.....

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..... [2]

(iii) MPAs more successfully increased species richness when all fishing was banned **and** monitoring of fishing vessels took place.

Suggest why these two methods increased the success of the MPAs.

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..... [2]

(c) MPAs are one method of conserving species richness.

Suggest **two other** methods that could be used.

1 .....

.....

2 .....

.....

[2]

[Total: 10]

7 Human activities, such as oil spills, littering and plastic release, have many impacts on marine ecosystems.

(a) State **two other** human activities that have an impact on the marine environment.

1 .....

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2 .....

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[2]

(b) Explain how ocean garbage patches are formed, and their impacts on marine ecosystems.

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..... [6]

[Total: 8]

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