Cambridge
O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5690659393

MARINE SCIENCE **5180/01**

Paper 1 Structured **October/November 2019**

1 hour 30 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **15** printed pages and **1** blank page.

Cambridge Assessment International Education

1 Seagrass is an important primary producer. Seagrass ecosystems support thousands of species, including endangered herbivores such as the green sea turtle.

Seagrass can absorb excess nitrates and phosphates that are washed from the land to the sea when it rains.

(a) (i) Name the process by which seagrass produces oxygen.

..... [1]

(ii) Define the term *herbivore.*

.....

..... [1]

(iii) Explain the importance of nitrates and phosphates for the growth of seagrass.

.....

.....

.....

.....

.....

..... [3]

(b) Seagrass ecosystems are being destroyed.

A coastal region in America lost all of its natural seagrass. In 2014, 1.8 km^2 was replanted.

In 2017 a survey in the same region reported that seagrass covered 25.2 km^2.

(i) Calculate the increase in area of seagrass between 2014 and 2017.

..... km^2
[1]

(ii) Use your answer from **b(i)** to calculate the percentage increase in area of seagrass between 2014 and 2017.

Show your working.

.....
[2]

(iii) Explain the effect of this increase in area of seagrass on the green sea turtle population.

.....

.....

.....

..... [2]

[Total: 10]

2 Figs. 2.1 and 2.2 show two fishing methods.

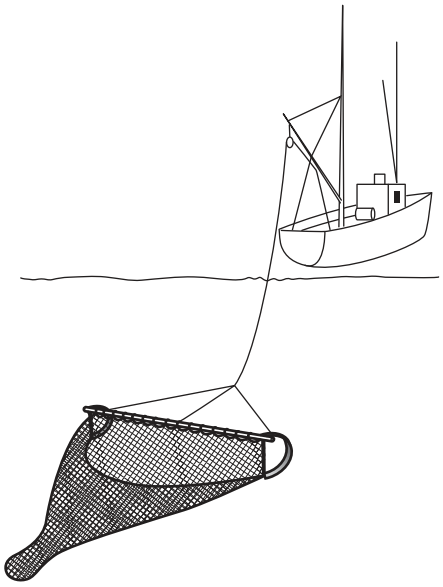

Fig. 2.1

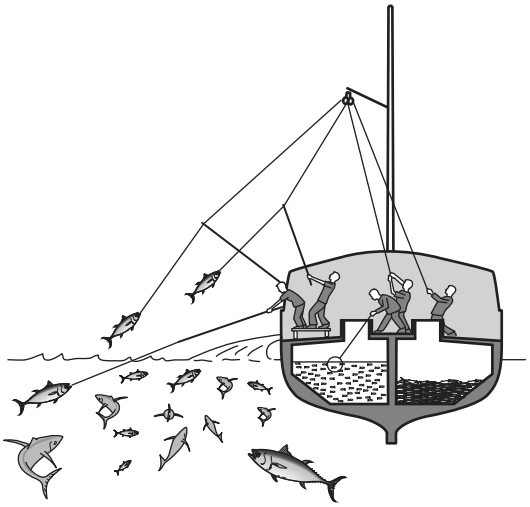

Fig. 2.2

(a) (i) Name the fishing methods shown in Figs. 2.1 and 2.2.

Fig. 2.1 .....

Fig. 2.2 .....

[2]

(ii) Explain why the fishing method shown in Fig. 2.1 is less sustainable than the fishing method shown in Fig. 2.2.

.....

.....

.....

.....

.....

..... [3]

(b) Name **two** navigational aids used by fishing boats. For each, describe **how** they aid navigation.

1 .....

.....

.....

2 .....

.....

.....

[4]

[Total: 9]

3 Table 3.1 shows photographs of two different habitats.

(a) (i) Complete Table 3.1 to name each habitat **and** state two features typical of each.

Table 3.1

	 **habitat 1**	 **habitat 2**
habitat name	.....	.....
feature 1	....	....
feature 2	....	....

[6]

Habitat 1 can be used for shrimp aquaculture.

(ii) Suggest one benefit **and** one impact of this type of aquaculture.

benefit .....

.....

impact .....

.....

[2]

(b) Fig. 3.1 shows a coral atoll.

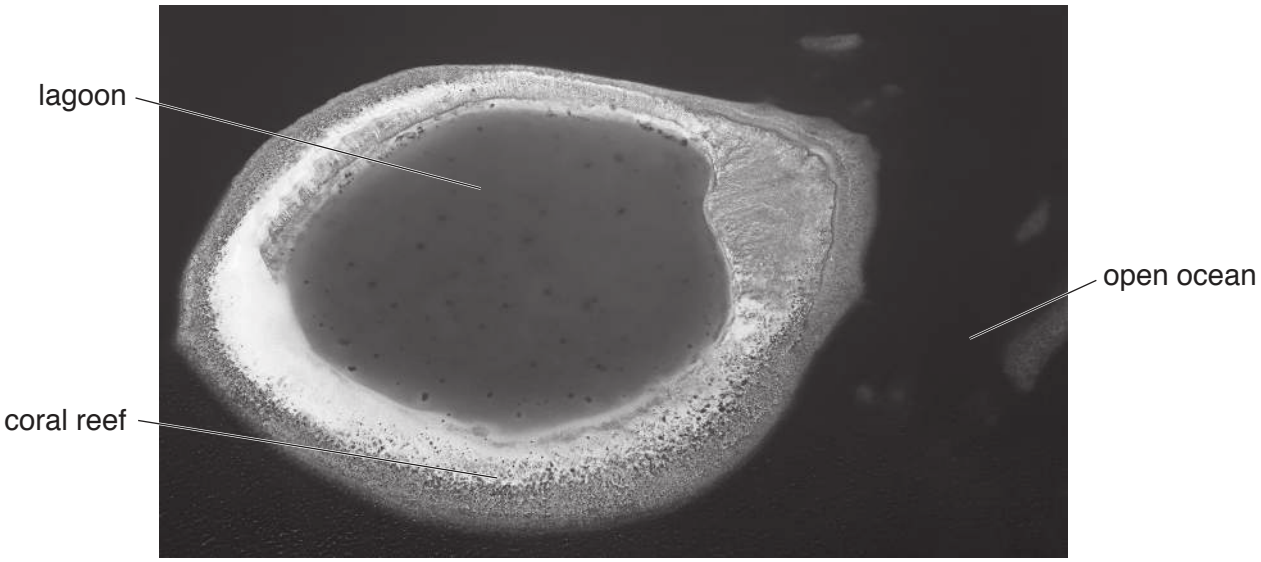

Fig. 3.1

State **three** ways in which water in the lagoon differs from water in the open ocean.

1 .....

2 .....

3 .....

[3]

[Total: 11]

4 Fig. 4.1 shows how fishing effort affects fish catch.

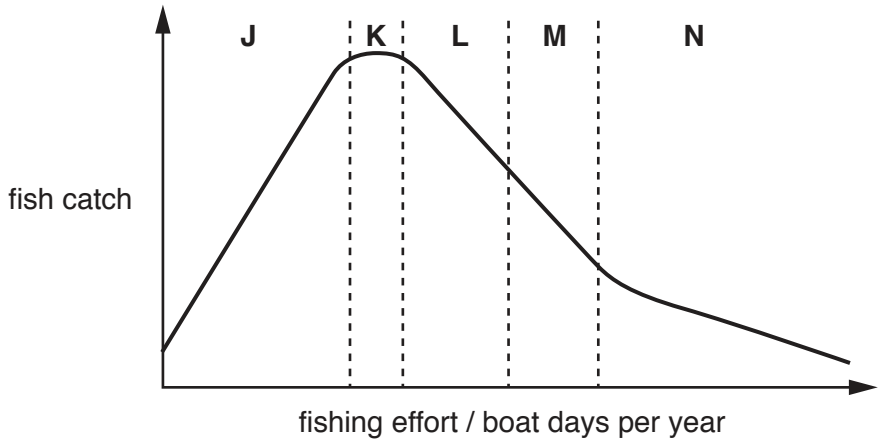

Fig. 4.1

(a) (i) Use Fig. 4.1 to state the letter which represents:

- Maximum Sustainable Yield (MSY) .....
- under fishing. .....

[2]

(ii) Explain what will happen to the fish stock if fishing effort occurs at the levels in part **M** of Fig. 4.1.

.....

.....

.....

..... [2]

(iii) Suggest why the MSY could be different from one year to another.

.....

.....

.....

..... [2]

(b) State **two** measures that can be taken to ensure fish stocks are conserved.

1 .....

.....

2 .....

.....

[2]

[Total: 8]

5 Table 5.1 shows the amount of fish exported from the Maldives between 2007 and 2011, and the earnings, in Maldivian Rufiyaa (MRF), on those exports.

Table 5.1

	2007	**2008**	**2009**	**2010**	**2011**
export quantity / thousand tonnes	70	68	40	35	40
earnings / millions MRF	1300	1590	995	945	1700
earnings per thousand tonnes / millions MRF	18.6	23.4	24.9	.....	42.5

(a) Use the information in Table 5.1 to calculate the earnings per thousand tonnes for 2010. Write your answer in Table 5.1. [1]

(b) Describe the trends in export quantity **and** earnings per thousand tonnes between 2007 and 2010.

export quantity .....

.....

earnings per thousand tonnes .....

.....

[2]

(c) Suggest reasons for the increase in earnings in 2011.

.....

.....

.....

..... [2]

[Total: 5]

6 **(a)** Spoilage begins once fish die.

Fig. 6.1 names types of spoilage and gives a description of each type.

Draw a line from each type of spoilage to its description.

putrefaction	oxidation of fats
rancidity	bacteria breakdown flesh
autolysis	stiffening of muscles
rigor mortis	enzymes breakdown flesh

Fig. 6.1

[3]

(b) Describe how fish are handled on fishing boats to minimise spoilage.

.....

.....

.....

.....

.....

..... [3]

(c) Exported fish may need to be transported over long distances.

Suggest how irradiation reduces fish spoilage.

.....

.....

.....

.....

.....

..... [3]

[Total: 9]

7 Fig. 7.1 shows tuna, a bony fish.

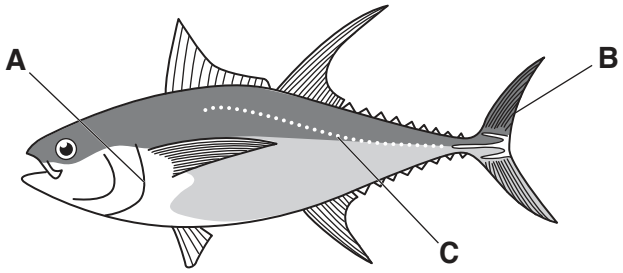

Fig. 7.1

Complete Table 7.1 by naming each feature **and** stating its main function.

Table 7.1

feature	name	main function
A	.....	....
B	.....	....
C	.....	....

[6]

[Total: 6]

8 **(a)** Harbours provide a range of functions and facilities for fishing boats.

State **three** features of a harbour.

1 .....

2 .....

3 .....

[3]

(b) **(i)** Explain how tourism can benefit fishermen.

.....

.....

.....

..... [2]

(ii) Discuss the conflicts that could occur between fisheries and tourism.

.....

.....

.....

.....

.....

..... [3]

(c) **(i)** Marine ecotourism has increased over the last seven years.

Explain the meaning of the term *ecotourism*.

.....

.....

.....

..... [2]

(ii) Ecotourists like to see unusual species, such as rays, turtles or whale sharks.

These can be found more often in areas with a special conservation status.

State the name of these areas.

..... [1]

[Total: 11]

Question 9 begins on page 14.

9 Fig. 9.1 shows an adult European lobster, *Homarus gammarus*, a decapod crustacean.

Fig. 9.1

(a) Describe fertilisation in European lobsters.

.....

.....

.....

.....

.....

..... [3]

(b) Natural European lobster populations are increased by hatching and growing lobsters in intensive aquaculture units. At 12 weeks old they are fully formed and are released into suitable habitats in the ocean.

(i) Describe the features of intensive aquaculture.

.....

.....

.....

..... [2]

(ii) Name **two** abiotic factors that must be considered when choosing a release site for European lobsters.

1 .....

2 .....
[2]

(iii) At 12 weeks old, the European lobsters are between 30 and 50 mm total length.

Suggest why European lobsters are released at 12 weeks old.

.....

.....

.....

..... [2]

(c) The European lobster is a valuable seafood product, which can only be legally harvested when its carapace length is over 87 mm.

Explain why there is a minimum harvesting size for European lobsters.

.....

.....

.....

..... [2]

[Total: 11]

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