Cambridge
O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8132988O06

MARINE SCIENCE **5180/03**

Paper 3 Practical Assessment Paper **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 **12** printed pages.

Cambridge Assessment International Education

1 Fig. 1.1 shows an image of a blue swimming crab, *Portunus pelagicus*.

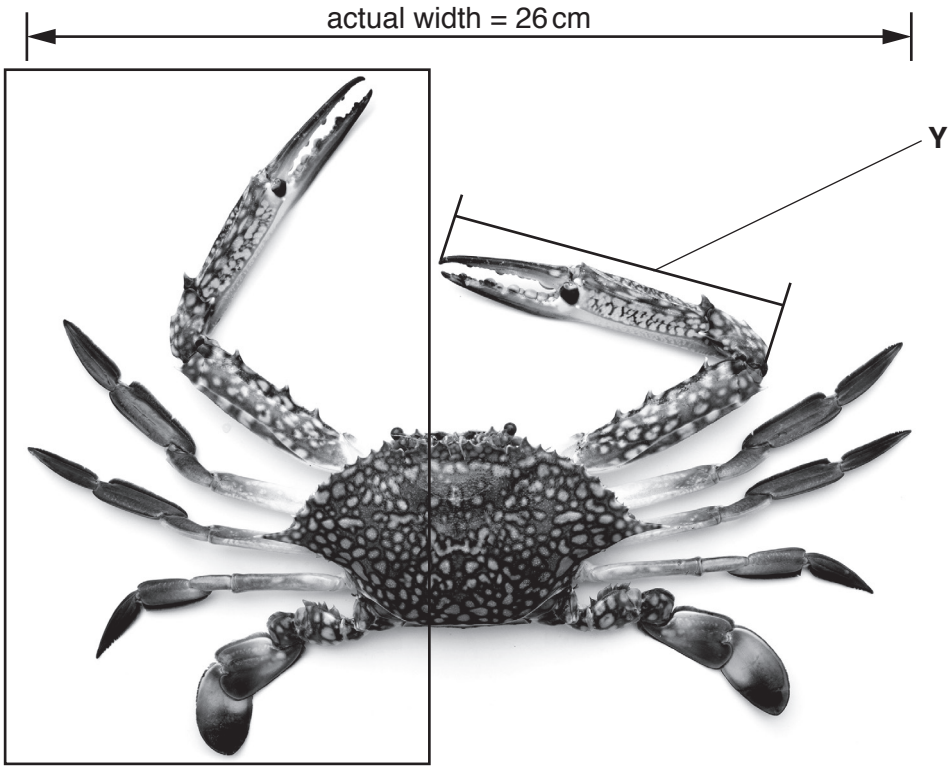


Fig. 1.1

(a) (i) Make a large, accurate drawing of the half of the crab shown in the box on Fig. 1.1. Do **not** show all the markings of this crab.

[5]

(ii) On your drawing, label each of the following features:

- eye
- carapace
- leg.

[3]

(b) (i) Calculate the magnification of the image shown in Fig. 1.1.

$$\text{magnification} = \frac{\text{image width}}{\text{actual width}}$$

Show your working.

.....

[2]

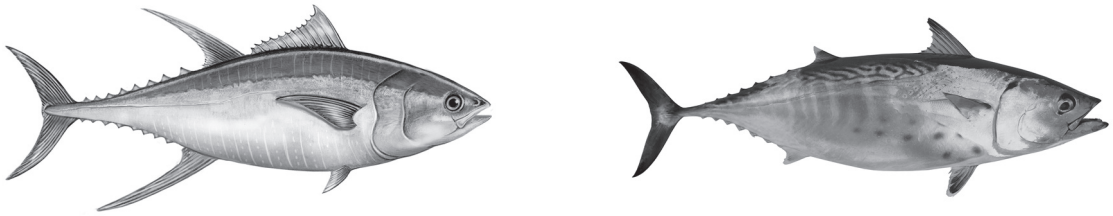
(ii) Use your magnification from **(b)(i)** to calculate the actual length of part **Y** of the crab shown in Fig. 1.1. Include your unit.

.....

[2]

[Total: 12]

2 **(a)** Fig. 2.1 shows two species of tuna, **A** and **B**.



A **B**

Fig. 2.1

(i) State **two** similarities, that can be seen in Fig. 2.1, between fish **A** and fish **B**.

1 .....

2 .....

[2]

(ii) State **two** ways, that can be seen in Fig. 2.1, in which fish **A** differs from fish **B**.

1 .....

2 .....

[2]

(b) Blue damselfish are a bait fish used to catch tuna in pole-and-line fishing.

A student investigated the length of blue damselfish. They collected five fish to measure, one of which is shown in Fig. 2.2.

Fig. 2.2

Their results are shown in Table 2.1.

(i) Complete Table 2.1 by measuring the total length of the blue damselfish shown in Fig. 2.2.

Table 2.1

fish number	total length/mm
1	85
2	93
3	72
4	82
5	.....

[1]

(ii) Calculate the mean length of the five damselfish shown in Table 2.1.

Show your working.

.....mm
[2]

(iii) Suggest why the mean length calculated in **(b)(ii)** may not be the same as the mean length of all blue damselfish in a shoal.

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..... [3]

[Total: 10]

3 **(a)** An intensive land-based aquaculture unit pumps waste water into the sea through a pipe, as shown in Fig. 3.1.

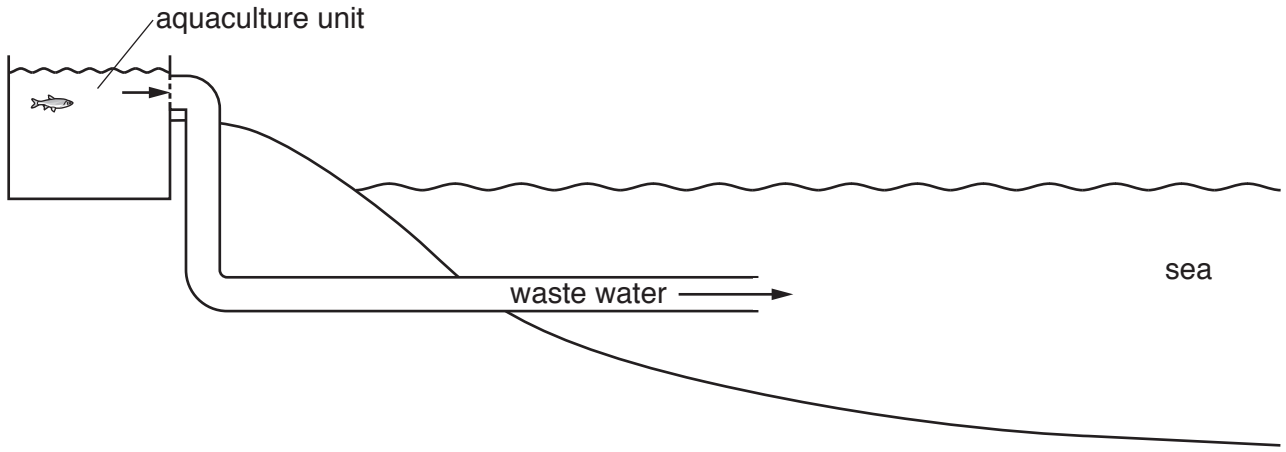

Fig. 3.1

A student investigated how light penetration through sea water changed with distance from the waste water pipe.

Describe the method that the student should have used.

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..... [6]

(b) Explain how you would test a sample of fish food used in the aquaculture unit to show that it contained each of the following:

(i) starch

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..... [2]

(ii) protein.

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..... [2]

[Total: 10]

[Turn over

4 A student investigated tidal height from the sea bed at a pontoon during one day.

Fig. 4.1 shows the pontoon.

Fig. 4.1

The student's results are shown in Fig. 4.2.

07:00 1.7 m, 09:00 1.2 m,
11:00 2.5 m, 13:00 3.9 m,
15:00 4.5 m,
17:00 3.8 m, 19:00 2.1 m 21:00 1.1 m

Fig. 4.2

(a) (i) Draw a table of results for the data shown in Fig. 4.2. In your table, organise the data in time order, from the start of the day.

[4]

(ii) Plot a graph to show the relationship between time of day and tidal height.

Join your points with a smooth line.

[4]

(iii) Use your graph to estimate the tidal height at 10:00.

..... m
[1]

(b) The depth from the water surface to the bottom of a boat is called the draft.

Fig. 4.3 shows how the draft of a boat is measured.

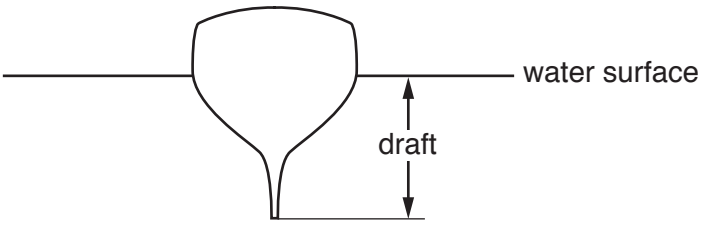

Fig. 4.3

A fishing boat with a draft of 2.5 m needs to moor at the pontoon.

State why the boat can only reach the pontoon between 11:00 and 18:30.

.....

..... [1]

[Total: 10]

5 A fisheries scientist investigated the fecundity of fish.

The scientist formed the following hypothesis.

The ovaries of larger fish contain more eggs than the ovaries of smaller fish.

(a) Design and describe an investigation which you could carry out to test this hypothesis.

Use the headings given to structure your answer.

- Method, including all the equipment needed and a safety precaution.
- Presentation and analysis of the results.

Method, including all the equipment needed and a safety precaution.

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Presentation and analysis of the results.

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[13]

Question 5 continues on page 12.

(b) Describe the limitations of your method and suggest improvements.

Suggest further work to extend the investigation.

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..... [5]

[Total: 18]