



Cambridge O Level

CANDIDATE
NAME

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MARINE SCIENCE

5180/03

Paper 3 Practical Assessment Paper

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

This document has **12** pages. Any blank pages are indicated.

1 Fig. 1.1 shows an image of a red snapper.



Fig. 1.1

- (a) (i) In the space below make a large, accurate drawing of the specimen in Fig. 1.1.
Do **not** draw all the scales.

[4]

(ii) Label the following features on your drawing:

- operculum
- lateral line
- a named median fin.

[3]

(b) (i) The actual measured total length of the fish is 36.2 cm.

Add a scale line to your drawing.

[2]

(ii) Measure and record the length of the image of the red snapper in Fig. 1.1.

..... cm [1]

(iii) Calculate the magnification of the image in Fig. 1.1 using the formula

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

Show your working.

..... [2]

[Total: 12]

2 Fig. 2.1 shows two different species of marine organism, **A** and **B**. They are not drawn to scale.

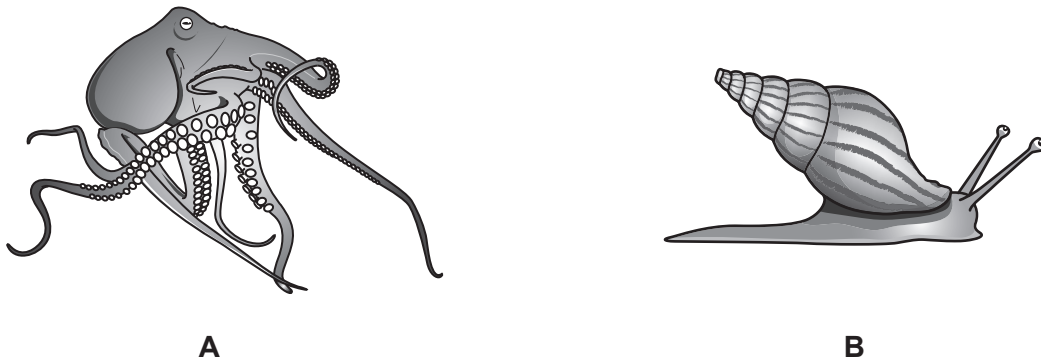


Fig. 2.1

(a) (i) Name the phylum both organisms belong to.

..... [1]

(ii) State the class each organism belongs to.

organism **A**

organism **B**

[2]

(b) Table 2.1 refers to features of organism **A** and organism **B**.

If the feature is present place a tick (✓) in the box. If the feature is absent place a cross (x) in the box.

Table 2.1

feature	organism A	organism B
external shell		
eyes		
foot		
suckers		
antennae present on head		

[5]

[Total: 8]

3 (a) A student investigates how sediment particle size distribution changes along a shore.

Describe a suitable method to investigate the sediment particle sizes from the shore.

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..... [5]

(b) Shells are collected from two areas of this shore.

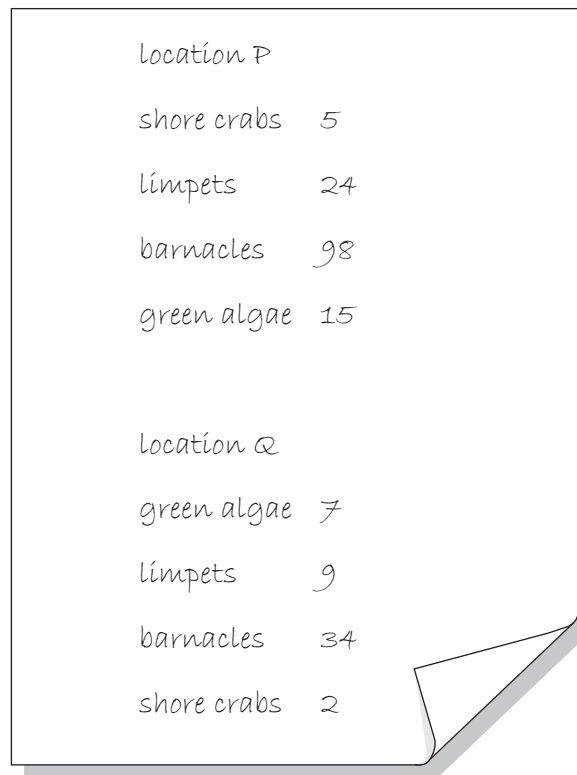
Describe a practical method to find the mean density of the shells from each area.

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..... [5]

[Total: 10]

- 4 A student investigates the distribution of four species of marine organisms at two different locations, **P** and **Q**.

Here is the page from their notebook.



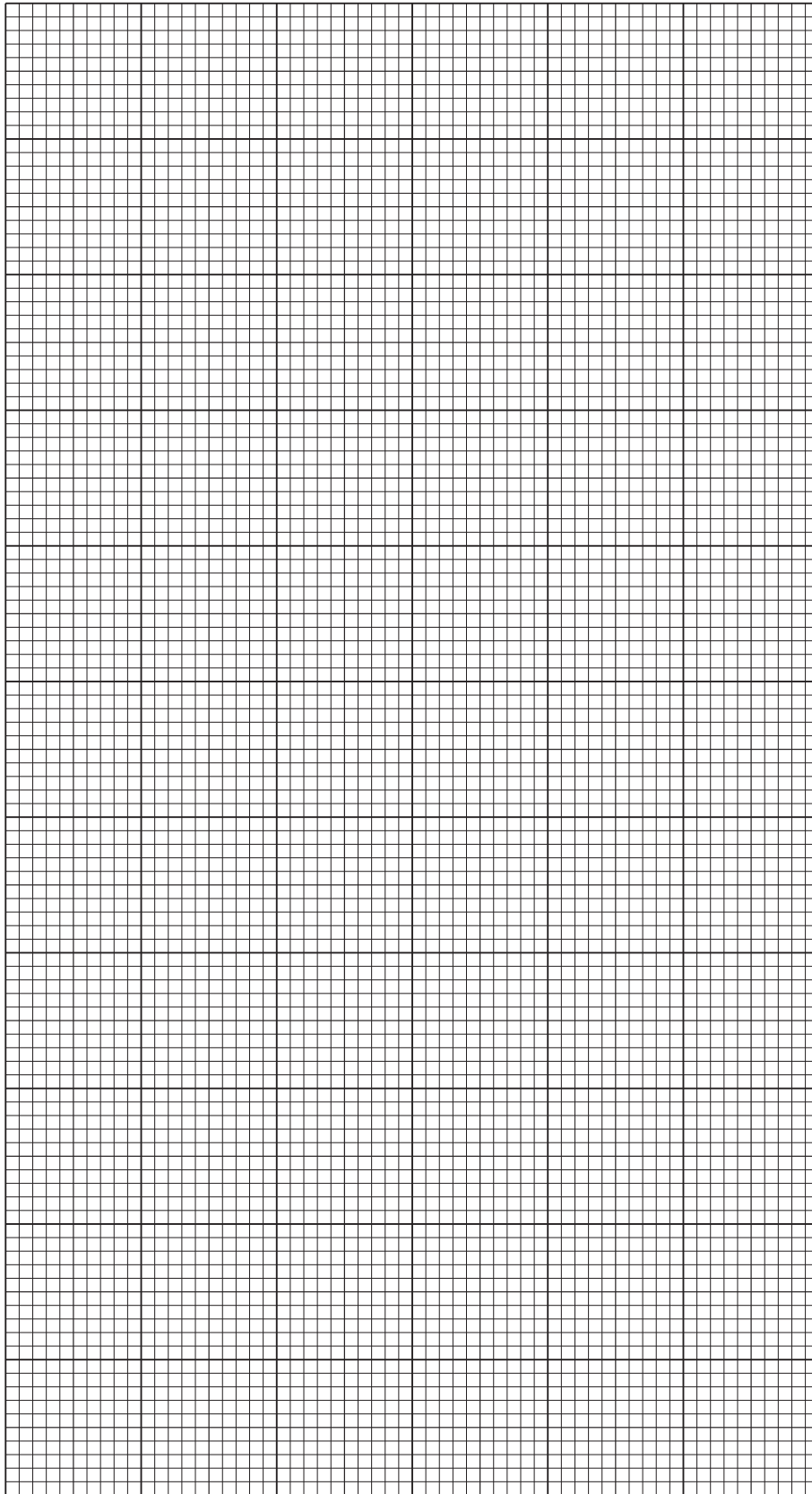
The image shows a page from a notebook with handwritten data. The page is divided into two sections, one for location P and one for location Q. Each section lists four species of marine organisms and their counts. The counts for location P are: shore crabs (5), limpets (24), barnacles (98), and green algae (15). The counts for location Q are: green algae (7), limpets (9), barnacles (34), and shore crabs (2).

location P	
shore crabs	5
limpets	24
barnacles	98
green algae	15
location Q	
green algae	7
limpets	9
barnacles	34
shore crabs	2

Fig. 4.1

- (a) Draw a table of results for the data shown in Fig. 4.1.

(b) Plot a bar graph of this data.



[5]

(c) Describe the difference in biodiversity between the two locations.

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.....

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..... [2]

[Total: 11]

- 5 A student notices that the mean length of mussels changes along a mussel bed. Part of the mussel bed is shown in Fig. 5.1. A single mussel is shown in Fig. 5.2.

The student makes the following hypothesis:

Faster current speed will increase the mean length of mussels growing in a mussel bed.



Fig. 5.1

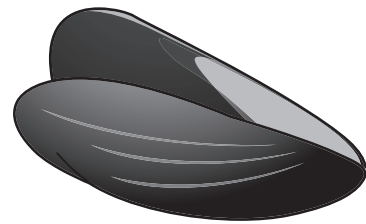


Fig. 5.2

- (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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[14]

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