

CANDIDATE  
NAME

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CENTRE  
NUMBER

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**MARINE SCIENCE**

**5180/03**

Paper 3 Practical Assessment Paper

**October/November 2014**

**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 in the spaces provided at the top of this page.

Write in dark blue or black ink.

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.

1 Fig. 1.1 shows a sardine (*Sardina* sp.).



**Fig. 1.1**

(a) In the box below, make an accurate drawing, magnified  $\times 2$ , of the specimen shown in Fig. 1.1. [4]

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

- caudal fin
- dorsal fin
- pectoral fin
- operculum.

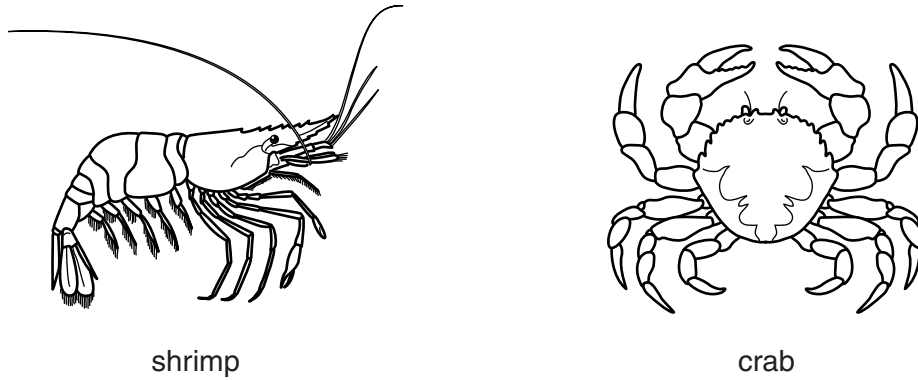
[4]

(c) The actual length of this specimen is 24 cm. On your drawing, include a suitable scale to show the actual length of the specimen. [1]

[Total: 9]

- 2 (a) Fig. 2.1 shows two specimens of marine organisms. Both of these organisms belong to the same phylum (major group).

There are visible differences between these two organisms.



**Fig. 2.1**

- (i) Name the phylum to which these organisms belong.  
 ..... [1]
- (ii) Give **two** features, visible in Fig. 2.1, which are characteristic of this phylum.  
 1 .....  
 .....  
 2 .....  
 ..... [2]
- (iii) Complete Table 2.1, by naming **three visible** features of these two organisms.  
 For each feature, give the differences between the shrimp and the crab.

**Table 2.1**

name of feature	shrimp	crab

[3]

(b) Fig. 2.2 shows a mollusc shell.



**Fig. 2.2**

(i) Measure and record the **maximum** width of this shell.

..... [1]

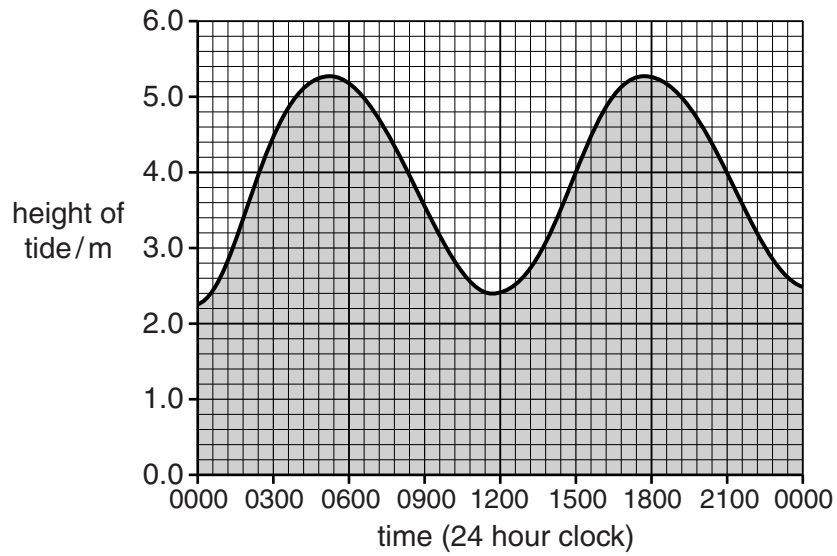
(ii) The actual maximum width of this shell is 78 mm.

Calculate the scale (magnification) of the shell in Fig. 2.2.

Show your working.

magnification ..... [2]

(c) Fig. 2.3 shows a recording of the tidal amplitude for a location on the coast of England.



**Fig. 2.3**

Use Fig. 2.3 to find each of the following:

(i) the height of the tide at 06.00

..... [1]

(ii) the time of the highest tide in the afternoon.

..... [1]

[Total: 11]

3 (a) Explain how you would find out whether a sample of *roshi* contains each of the following food substances:

(i) protein

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

(ii) reducing sugar.

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(b) Explain how you would find the mean current speed in a shallow lagoon.

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..... [5]

[Total: 10]

**Turn over for Question 4**

- 4 Limpets are molluscs that are commonly found on rocky shores. Fig. 4.1 shows limpets attached to a rock.



**Fig. 4.1**

A student carried out an investigation into the relationship between the maximum length and the height of limpet shells.

He measured and recorded the length and height of six shells. His record of results is shown in Fig. 4.2.

limpet 1, length = 31 mm, height = 11 mm
limpet 2, length = 44 mm, height = 15 mm
limpet 3, length = 37 mm, height = 13 mm
limpet 4, length = 56 mm, height = 18 mm
limpet 5, length = 62 mm, height = 21 mm
limpet 6, length = 50 mm, height = 18 mm

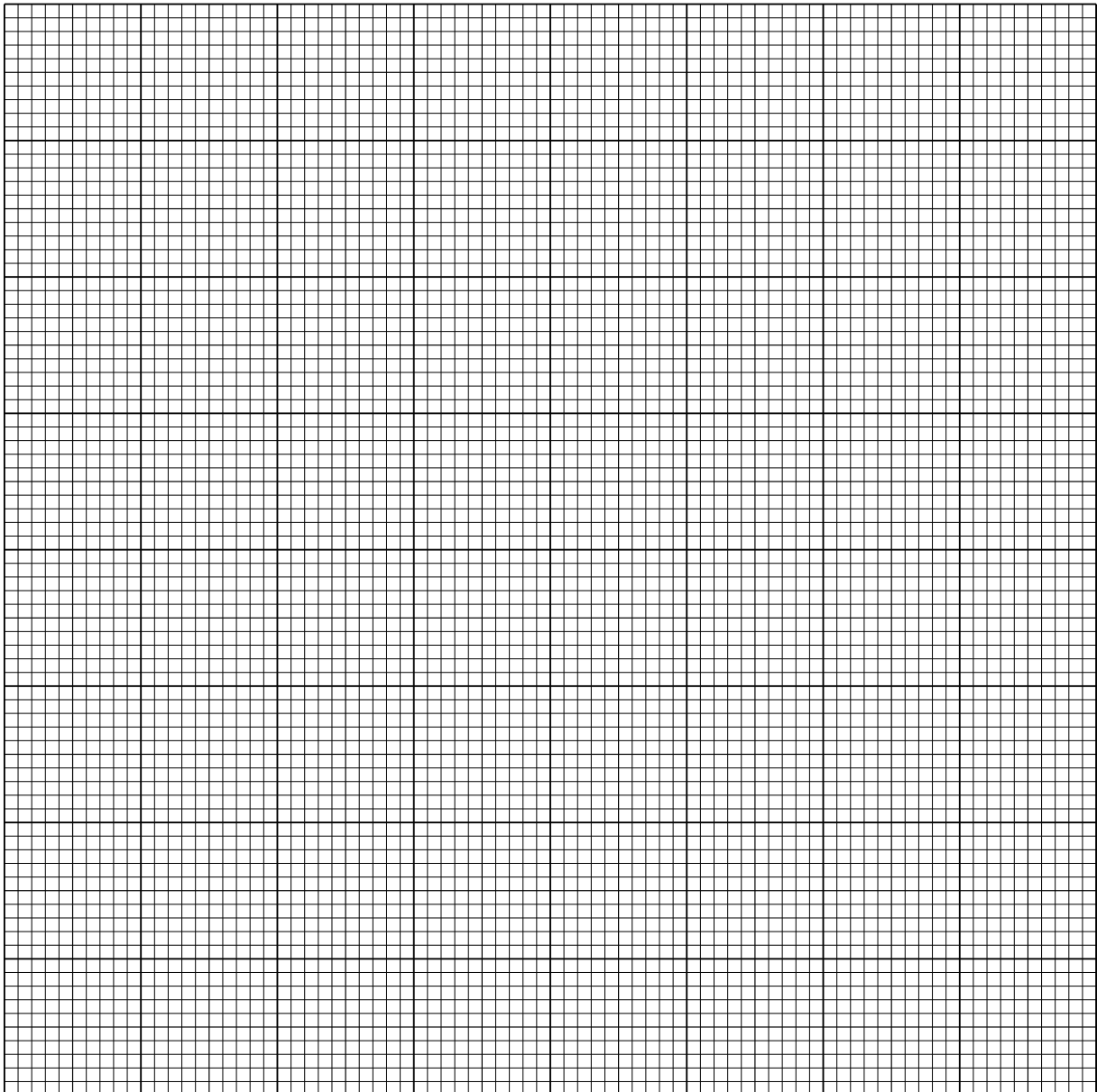
**Fig. 4.2**

- (a) In the space below, prepare a suitable table of these results.

In your table, show the mean length and the mean height of the shells.



(b) Plot a graph of these results to show the relationship between length and height of limpet shells. Draw a line of best fit through the points on your graph.



[5]

(c) What conclusion can be drawn from these results?

.....

..... [1]

[Total: 11]

**5** Seagrasses are flowering plants which grow in shallow water in many coastal habitats.

A student noticed that there seemed to be more seagrasses growing on the shore on the south side of an island than on the north side of the island.

She formed the following hypothesis:

The number of seagrass plants per unit area is higher on the south side of the island than it is on the north side.

Design and describe an investigation which you could carry out to test this hypothesis, using the headings below to structure your answer.

- Method, including any apparatus required and safety precautions.
- Presentation and evaluation of results.
- Limitations of your method and suggestions for further work to extend the study.

**(a)** Method, including any apparatus required and safety precautions.

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**(b)** Presentation and evaluation of results.

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