

CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
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**MARINE SCIENCE**

**9693/02**

Paper 2 AS Data-Handling and Free-Response

**May/June 2016**

**1 hour 15 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.**

**Section A**

Answer **both** questions in this section.

Write your answers in the spaces provided on the Question Paper.

**Section B**

Answer **both** questions in this section.

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 **10** printed pages and **2** blank pages.



(c) The productivity of producers is higher in locations with high rates of nitrogen fixation. Suggest an explanation for this.

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.....[3]

(d) Suggest **two** factors, other than the rate of nitrogen fixation, that may affect the availability of nitrogen in marine ecosystems.

1 .....

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2 .....

.....[2]

[Total: 9]





- (b) An investigation was carried out into the burrowing ability of cockles.

A total of 139 cockles were collected from the surface of a habitat (Group **A**) and 127 cockles were collected from under the surface of the same habitat (Group **B**).

These cockles were placed in a tank of sea water that had five centimetres of sediment at the bottom. All the cockles were placed on the surface of the sediment. After two hours, the numbers of cockles that had burrowed into the sediment were counted.

The results are shown in Table 2.1.

**Table 2.1**

<b>group</b>	<b>position from which cockles were collected</b>	<b>number of cockles placed on the surface of the sediment in the tank</b>	<b>number of cockles that had burrowed into the sediment after 2 hours</b>
<b>A</b>	surface of habitat	139	7
<b>B</b>	under the surface of the habitat	127	79

- (i) Using the data in Table 2.1, calculate the percentage of cockles that had burrowed in each group.

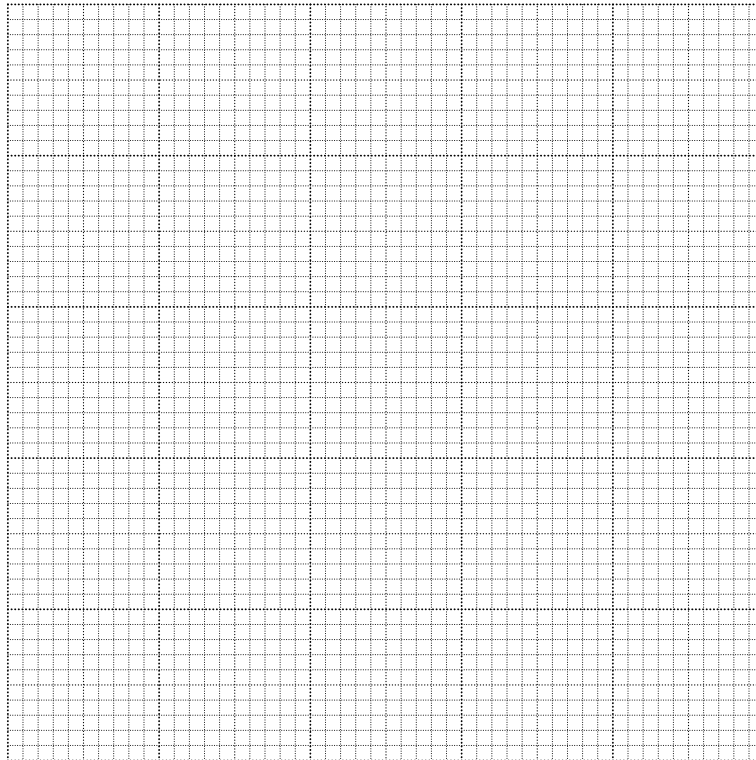
Write your answers in Table 2.2.

**Table 2.2**

<b>percentage of cockles that burrowed in Group A</b>	<b>percentage of cockles that burrowed in Group B</b>

[2]

(ii) On the grid below, plot a bar graph to show the data in Table 2.2.



[3]

(iii) Formulate a hypothesis based on the results of this investigation.

.....

.....

.....[1]

[Total: 11]







4 (a) Explain what is meant by the term *thermocline*.

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.....[2]

(b) (i) Outline the effects of evaporation and precipitation on salinity.

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(ii) Suggest why the salinity of sea water is often lower near to the coast than it is in the open ocean.

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.....[2]



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