



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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MARINE SCIENCE

9693/02

Paper 2 AS Data Handling and Free Response

October/November 2012

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 a pencil for any diagrams, graphs or rough work.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

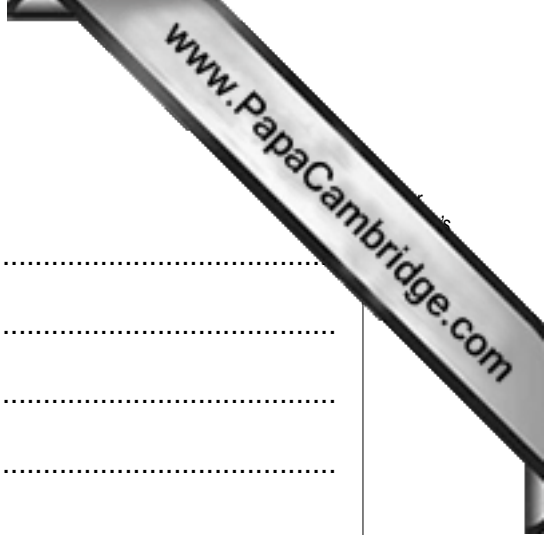
At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
Total	

This document consists of **9** printed pages and **3** blank pages.





(b) Suggest explanations for the changes you have described.

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..... [4]

(c) (i) Describe the relationship between the concentration of dissolved carbon dioxide and the pH of the water.

.....
..... [1]

(ii) Suggest an explanation for this relationship.

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

[Total: 10]

2 The calcification rate of a coral is a measure of the rate at which calcium carbonate (CaCO_3) is deposited in a coral skeleton. The calcification rate is influenced by a number of factors, including the availability of calcium carbonate and the temperature of sea water.

(a) Suggest **two** factors, other than temperature and availability of calcium carbonate, that affect the growth rate of corals. Give an explanation for the effect of each factor on the growth rate of corals.

factor 1

effect on growth rate of coral

.....

factor 2

effect on growth rate of coral

.....
 [4]

(b) In an investigation, the calcification rates of a large coral (*Porites*) were determined at a number of sites in Australia, Hawaii and Thailand. The calcification rate was measured as the mass of calcium carbonate deposited in the coral, per unit area, per year.

The results of this investigation are shown in Fig. 2.1.

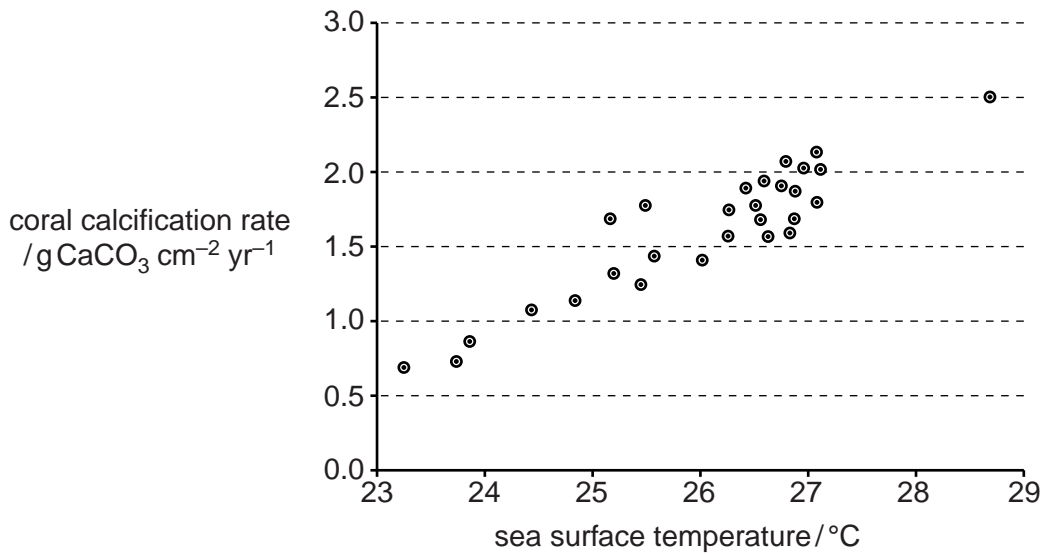
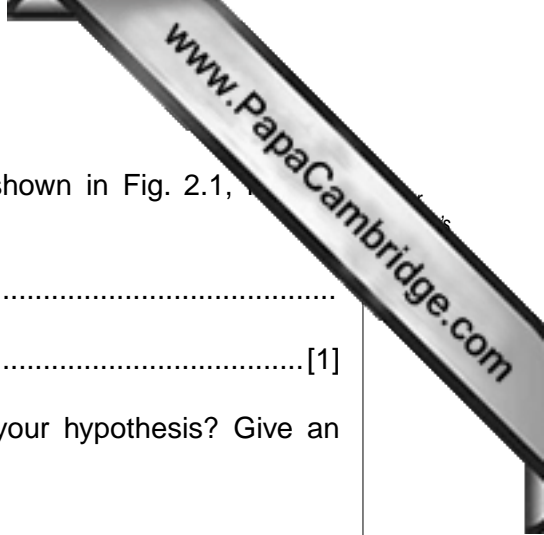


Fig. 2.1



(i) Formulate a suitable hypothesis, based on the data shown in Fig. 2.1, for this investigation.

.....
..... [1]

(ii) Do the results of this investigation support or refute your hypothesis? Give an explanation for your answer.

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..... [2]

(iii) Give reasons why the data shown in Fig. 2.1 could lead to uncertainty in the interpretation of the results.

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..... [3]

[Total: 10]



(c) Suggest explanations for each of these observations.

(i) The concentration of dissolved oxygen is often low in a lagoon.

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..... [2]

(ii) The salinity of the water in a lagoon may be higher than the salinity in the open ocean.

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..... [3]

[Total: 15]

Copyright Acknowledgements:

Question 1 Table 1.1 © ADAPTED: Keeley et al; American Journal of Botany; <http://www.werc.usgs.gov/OLDsitedata/seki/pdfs/ajb4.pdf>.
Question 2 Figure 2.1 © ADAPTED: <http://people.uncw.edu/szmanta/2006%20pdfs/20%20Global%20warming%20issues/McNeil%20etal%2004%20GRL%20calcification%20with%20warming%20with%20comments%20and%20reply.pdf>.

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