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

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

MARINE SCIENCE **9693/01**

Paper 1 AS Structured Questions **May/June 2013**

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 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.

Electronic calculators may be used.

This document consists of **14** printed pages and **2** blank pages.

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For Examiner's Use

1 **(a)** Explain what is meant by each of the following terms used in ecology.

(i) habitat .....

..... [1]

(ii) community .....

.....

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..... [2]

(b) Table 1.1 shows the range of particle sizes found on two different types of shore.

Table 1.1

type of shore	particle diameter / mm
sandy	0.02 to 2.0
muddy	0.002 to 0.2

(i) Compare the particle sizes of the sandy shore and the muddy shore.

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..... [3]

(ii) Explain how the process of sedimentation gives rise to a muddy shore.

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..... [3]

(iii) Using the information in Table 1.1 and your own knowledge, explain why a rocky shore tends to have a higher biodiversity than a sandy shore.

For Examiner's Use

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[Total: 13]

For Examiner's Use

2 **(a)** Fig. 2.1 shows the oxygen concentration at different temperatures in fresh water.

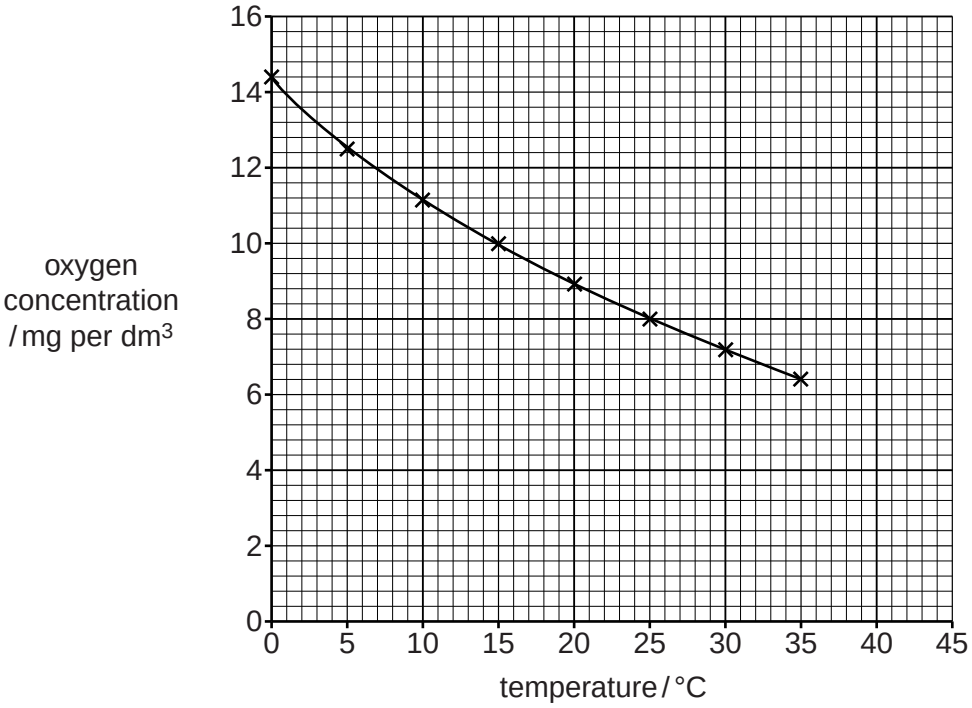

Fig. 2.1

(i) State the change in oxygen concentration between 5 °C and 15 °C.

..... [2]

(ii) Use Fig. 2.1 to estimate the oxygen concentration at a temperature of 45 °C.

..... [1]

(iii) Table 2.1 shows the oxygen concentration in sea water at different temperatures.

Table 2.1

temperature / °C	0	5	10	15	20	25	30	35
oxygen concentration / mg per dm^3	11.4	10.0	8.6	8.0	7.4	6.4	6.0	5.4

Plot these data on Fig. 2.1. [4]

(iv) Describe the differences between the oxygen concentrations in fresh water and in sea water.

For Examiner's Use

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..... [3]

For Examiner's Use

(b) Fig. 2.2 shows the oxygen concentration at different depths in sea water.

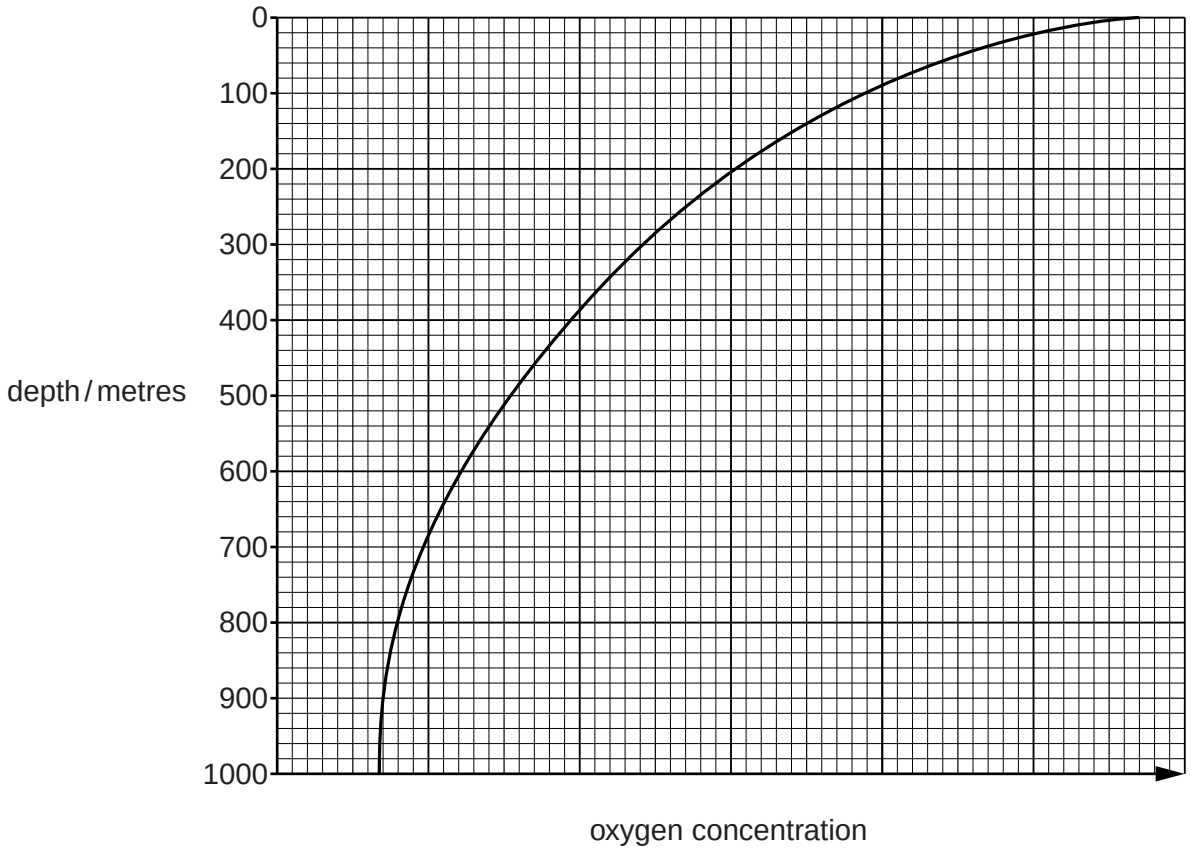

Fig. 2.2

Explain the relationship between oxygen concentration and depth as shown in Fig. 2.2.

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..... [5]

[Total: 15]

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Turn over for question 3.

For Examiner's Use

3 Fig. 3.1 shows part of a food web in a kelp forest.

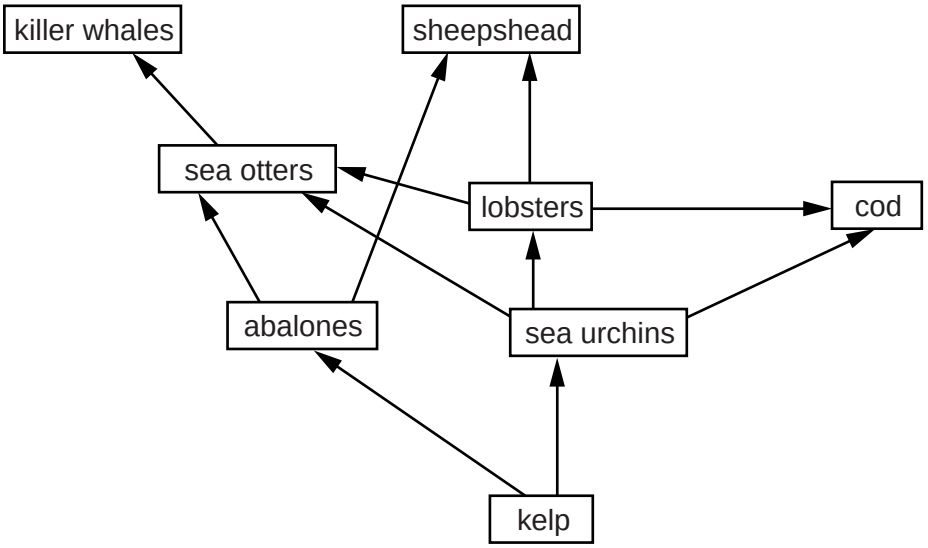

Fig. 3.1

(a) With reference to Fig. 3.1, explain what is meant by a *producer*.

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..... [4]

(b) With reference to Fig. 3.1, explain what is meant by a *predator-prey relationship*.

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(c) Commercial fishing in this area targets cod and sheepshead.

Using the information in Fig. 3.1, suggest and explain **one** possible effect of commercial fishing on the population of sea otters.

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..... [4]

[Total: 11]

For Examiner's Use

For Examiner's Use

4 **(a)** Describe **three** pieces of evidence supporting the theory of plate tectonics.

1 .....

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2 .....

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3 .....

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..... [6]

(b) Fig. 4.1 shows one type of tectonic plate boundary.

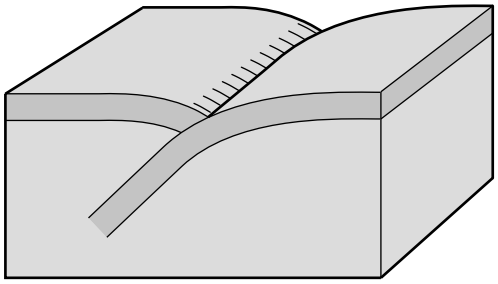

Fig. 4.1

With reference to Fig. 4.1, explain how movements at a plate tectonic boundary can lead to the formation of an ocean trench.

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..... [3]

(c) Explain how movements at a plate tectonic boundary can lead to the formation of a tsunami.

For Examiner's Use

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..... [4]

[Total: 13]

For Examiner's Use

5 **(a)** **(i)** Explain what is meant by the term *productivity*, in marine ecosystems.

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..... [3]

(ii) List **three** factors which affect productivity.

1 .....

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2 .....

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3 .....

..... [3]

(b) Fig. 5.1 shows variations in productivity with depth in the Northeast Pacific Ocean in winter, spring and summer.

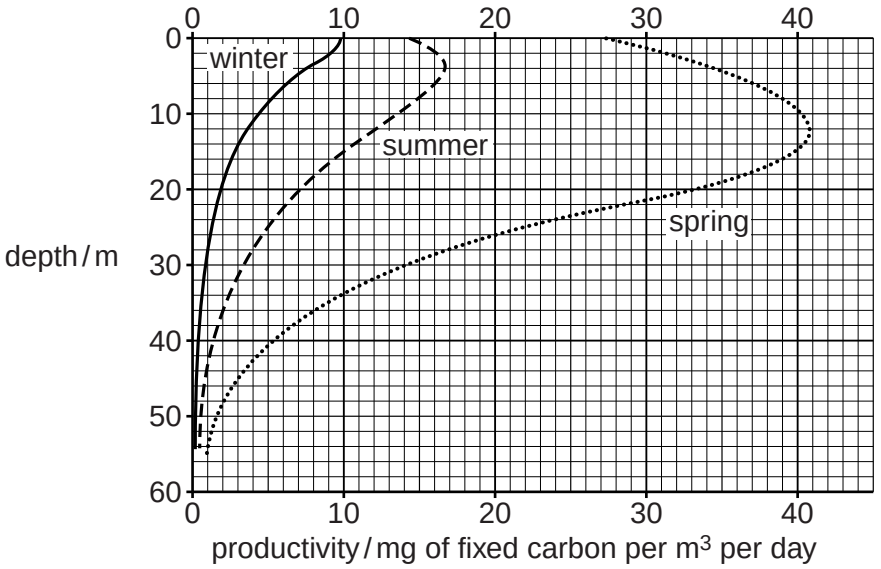

Fig. 5.1

For Examiner's Use

(i) State the depth at which the difference in productivity between winter and spring is greatest.

.....[1]

(ii) Suggest explanations for the differences between the productivity in the Northeast Pacific Ocean in the winter and the spring.

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.....[4]

[Total: 11]

For Examiner's Use

6 **(a)** Runoff is important in replenishing the reservoir of dissolved nutrients in the sea.

(i) Describe what is meant by the term *runoff*.

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(ii) Suggest how runoff can be harmful to marine organisms.

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..... [3]

(iii) Suggest how runoff can be beneficial to marine organisms.

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..... [2]

For Examiner's Use

(b) The mean concentration of calcium in sea water is 0.41 parts per thousand.

Suggest why this concentration remains approximately constant.

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..... [4]

[Total: 12]

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