



Cambridge International AS & A Level

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MARINE SCIENCE

9693/12

Paper 1 AS Level Theory

May/June 2026

1 hour 45 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. Do **not** use correction fluid or tape.
- 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 75.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Any blank pages are indicated.

Section A

Answer **all** questions in this section.

- 1 (a) Organisms are classified into groups.

State the name of the largest group in the taxonomic hierarchy.

..... [1]

- (b) Figure 1.1 is a photograph of a species of echinoderm, *Ophiothrix fragilis*.

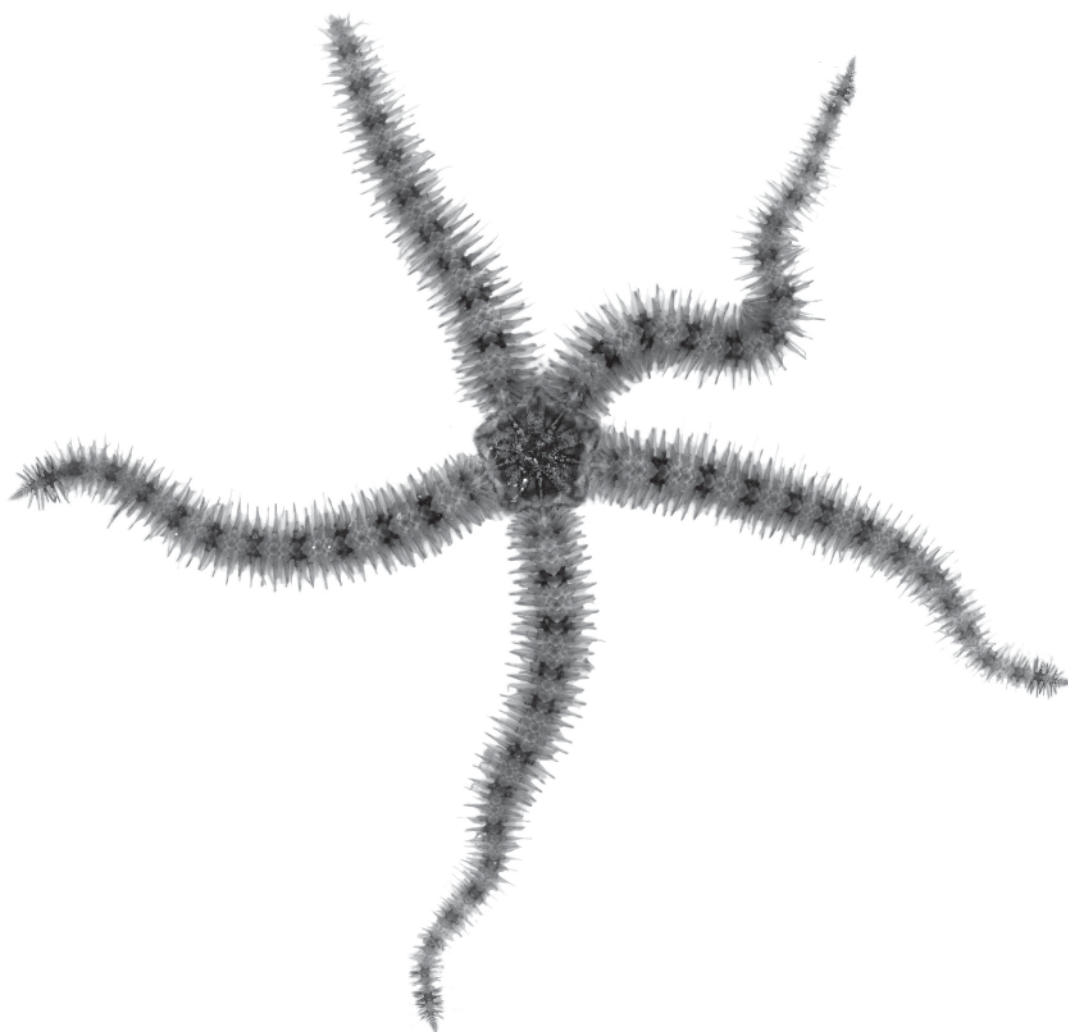


Figure 1.1





(i) State the genus of the echinoderm shown in Figure 1.1.

..... [1]

(ii) State **two** features visible in Figure 1.1 that identify this organism as an echinoderm.

1

2

[2]

(iii) Describe the **positive** ecological **and** economic effects that echinoderms have on coastal communities.

.....

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.....

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.....

.....

..... [4]

(c) Some echinoderms have a commensal relationship with pearlfish.

(i) Describe what is meant by a commensal relationship.

.....

..... [1]

(ii) State **two** other types of symbiotic relationship.

1

2

[2]

[Total: 11]

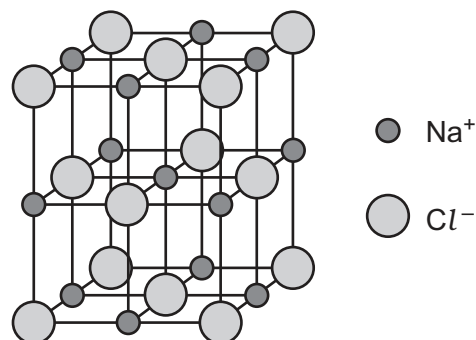


2 Water is a compound that has covalent bonds.

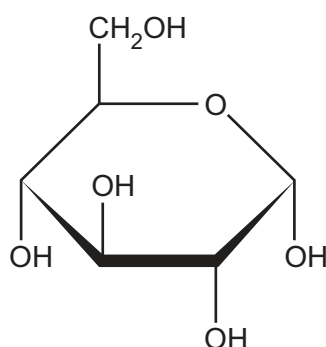
(a) Figure 2.1 shows the structure of some other compounds.



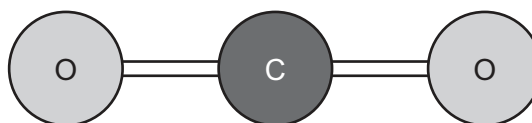
compound A



compound B



compound C



compound D

Figure 2.1

Use Figure 2.1 to complete Table 2.1 by stating the name of the compounds **and** whether the bonding in the compound is ionic or covalent.

Table 2.1

compound	name of compound	ionic or covalent bonding
A		
B		
C		
D		

[4]



- (b) Figure 2.2 is an incomplete diagram showing the outer electron shells of the elements in water.

Complete Figure 2.2 to show the covalent bonding in a molecule of water.

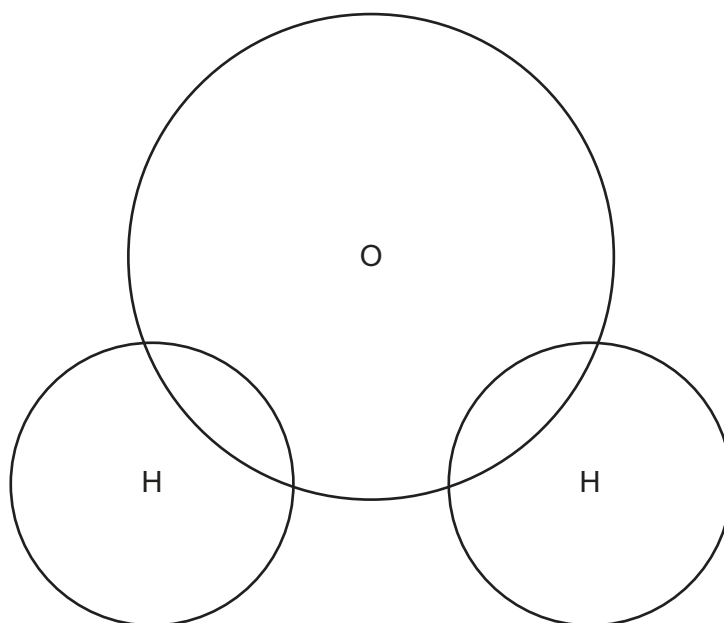


Figure 2.2

[1]

- (c) Explain how water is able to act as a solvent.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 9]

3 Figure 3.1 shows a map of some of the world's oceans.

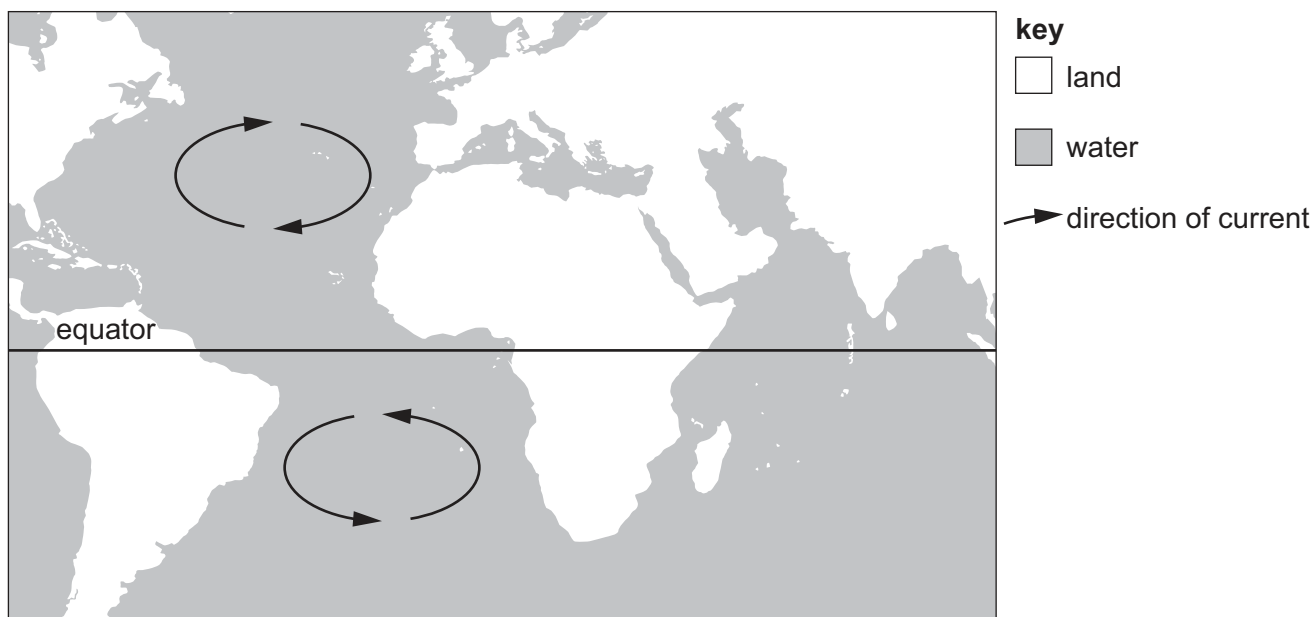


Figure 3.1

(a) On Figure 3.1, label the location of the Indian Ocean with the letter **X**. [1]

(b) Describe the currents **and** explain the difference in the direction of the currents between the Northern hemisphere and the Southern hemisphere shown in Figure 3.1.

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.....

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..... [4]



(c) Suggest **two** reasons why the global ocean conveyor belt is important.

1

.....

2

.....

[2]

[Total: 7]



- 4 Figure 4.1 is a diagram of the different zones in the open ocean.

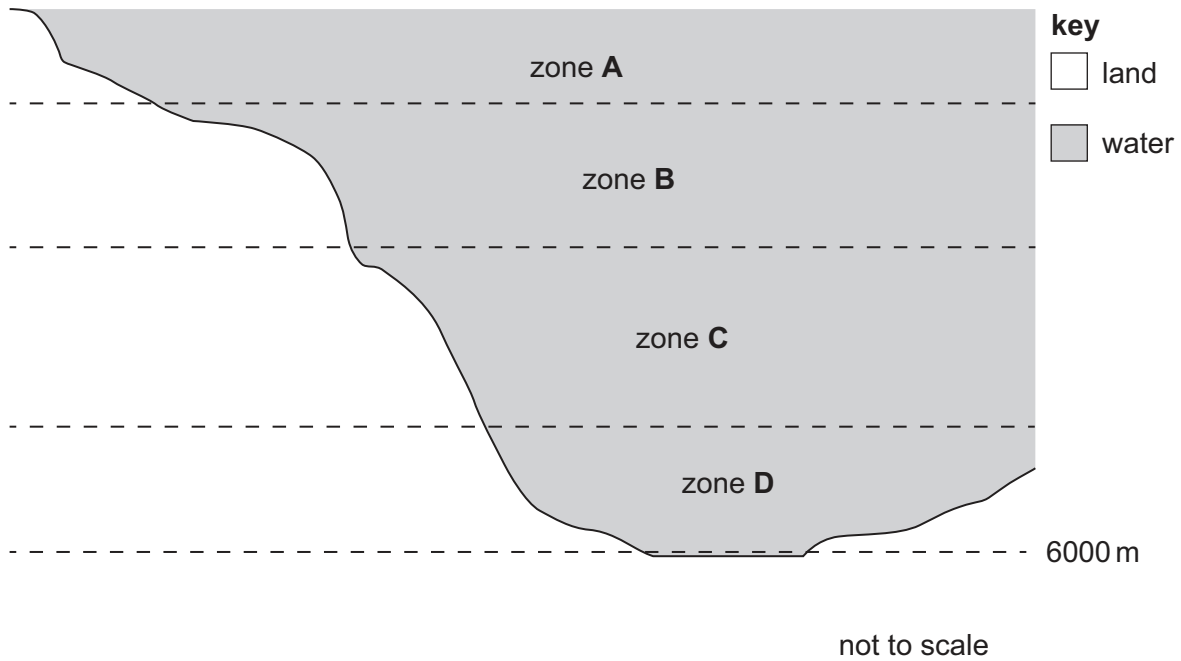


Figure 4.1

- (a) State the name of zone C in Figure 4.1.

..... [1]

- (b) State the type of producers found at the bottom of zone D in Figure 4.1.

..... [1]

- (c) Explain reasons why there is a greater concentration of oxygen in zone C than in zone B in Figure 4.1.

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.....
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.....
.....
..... [4]



(d) Explain why some benthic zones receive light and some do not receive light.

.....

.....

.....

..... [2]

[Total: 8]



5 Figure 5.1 shows a diagram of a delta.

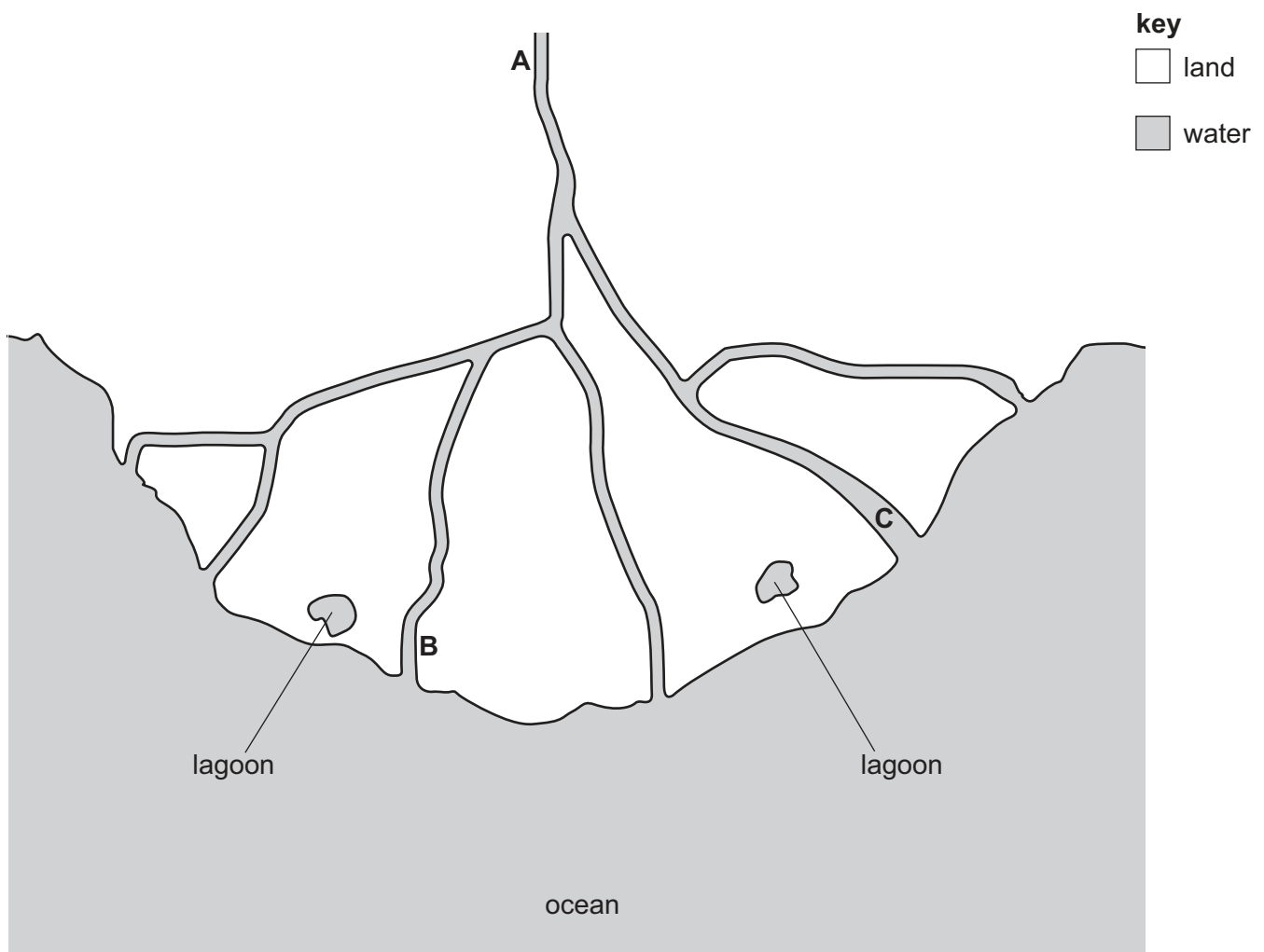


Figure 5.1

(a) Deltas are formed by weathering, erosion and sedimentation.

(i) Describe the difference between weathering and erosion.

.....

.....

.....

..... [2]

(ii) State **two** types of erosion.

1

2 [1]



- (b) Explain why the size of particle deposited at location **A** is larger than the size of particle deposited at location **B** in Figure 5.1.

.....

.....

.....

.....

.....

..... [3]

- (c) Suggest reasons why the salinity of the water in the lagoons is higher than the salinity of the water at location **C** in Figure 5.1.

.....

.....

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.....

.....

..... [4]

[Total: 10]





Answer **all** questions in this section.

[8]

[8]



(b) Explain why sandy shores have lower species biodiversity than rocky shores.

[6]

[Total: 14]





7 Discuss how phosphorus in surface waters is replenished and depleted.

[9]

[9]





..... [7]



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