



Cambridge International AS & A Level

CANDIDATE NAME

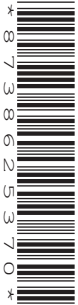


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MARINE SCIENCE

9693/12

Paper 1 AS Level Theory

October/November 2025

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 or correction fluid.
- 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 Fig. 1.1 shows diagrams of some of the substances found in sea water.

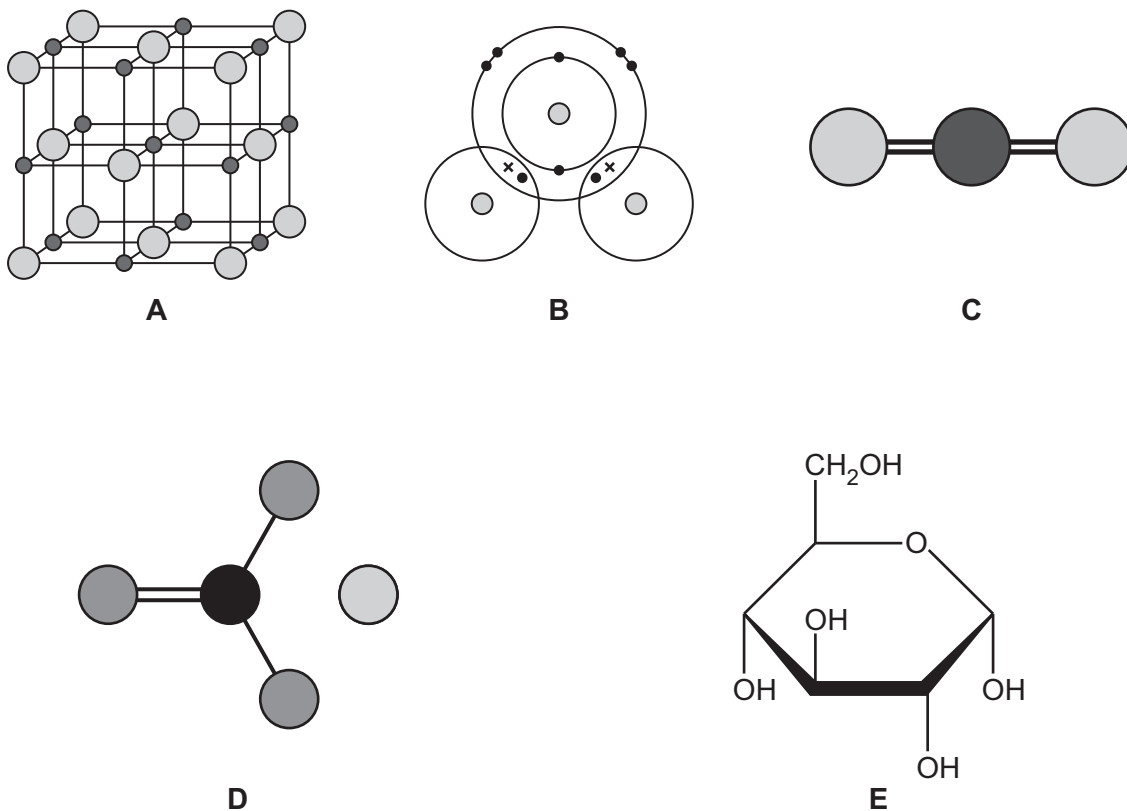


Fig. 1.1

(a) State the letters from Fig. 1.1 that identify the substance or substances that:

are products of respiration **and**

are salts **and**

can form hydrogen bonds

has the formula CaCO_3

is a product of photosynthesis.

[5]

(b) Describe the evidence from Fig. 1.1 which shows that substance **B** has covalent bonds.

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

[Total: 6]



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2 (a) Fig. 2.1 shows some drawings of different species of crustacean.

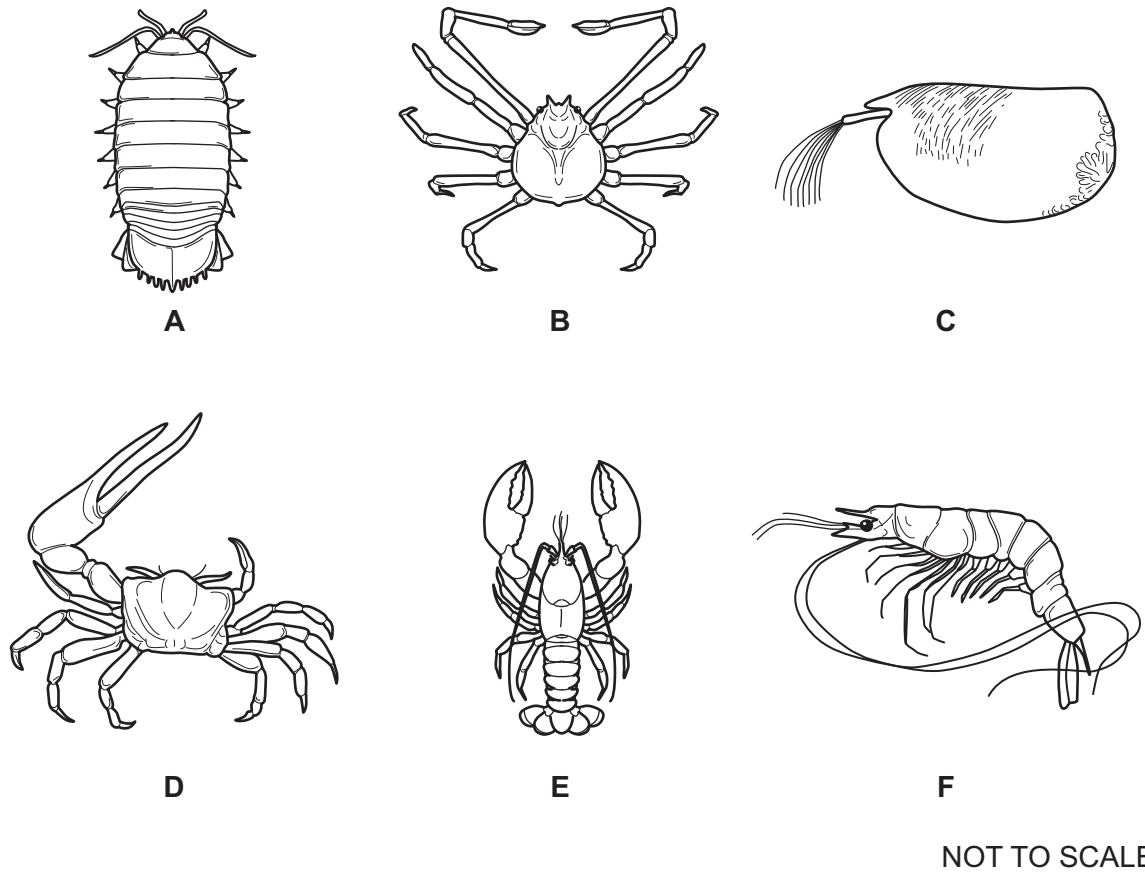


Fig. 2.1

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Fig. 2.2 is a dichotomous key. This dichotomous key can be used to identify the different species of crustacean in Fig. 2.1.

Species **F** has been identified.

Complete Fig. 2.2 with the correct letter for each species.

			Letter
1	more than ten legs visible	go to 2	
	ten or fewer legs visible	go to 3	
2	one pair of antennae longer than the length of its body	<i>Penaeus monodon</i>	F
	antennae shorter than the length of its body	<i>Bathynomus giganteus</i>
3	a visible tail-like structure	go to 4	
	no visible tail-like structure	go to 5	
4	visible claws	<i>Homarus gammarus</i>
	no visible claws	<i>Alacia hettacra</i>
5	claws of the same size	<i>Macrocheira kaempferi</i>
	claws of different sizes	<i>Minuca pugnax</i>

[3]

Fig. 2.2

(b) State **three** features that are typical of an adult crustacean.

1

2

3.....

[3]

[Total: 6]



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3 (a) Fig. 3.1 shows the view from the side and the view from above of three different types of coral reef, A, B and C.

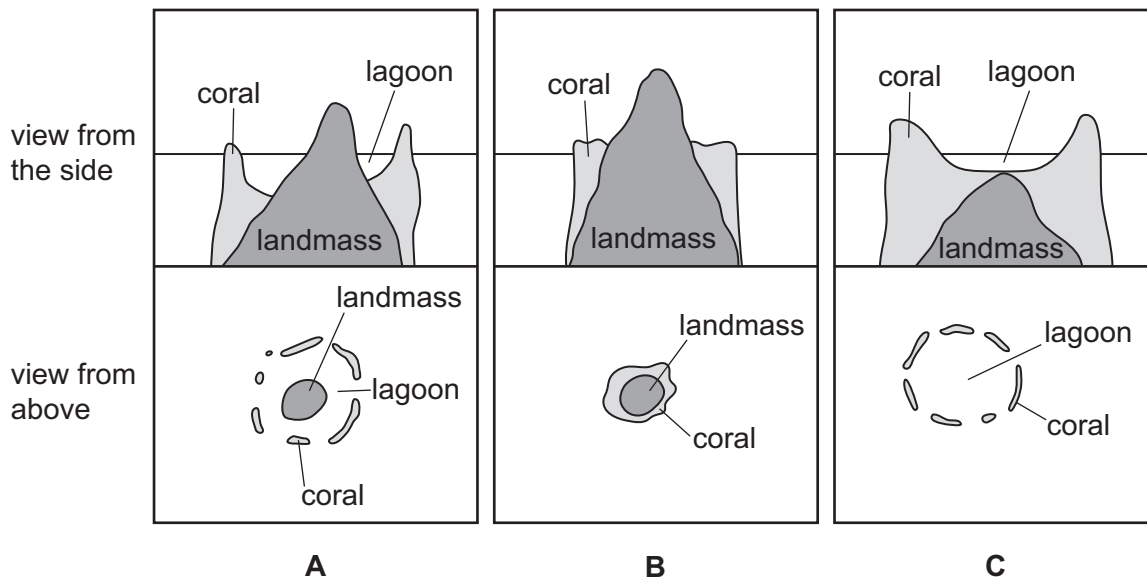


Fig. 3.1

Identify the types of coral reef shown in Fig. 3.1.

A

B

C

[3]



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(b) Fig. 3.2 is a diagram of a coral polyp.

(i) On Fig. 3.2 label the:

- mouth
- stomach
- basal plate.

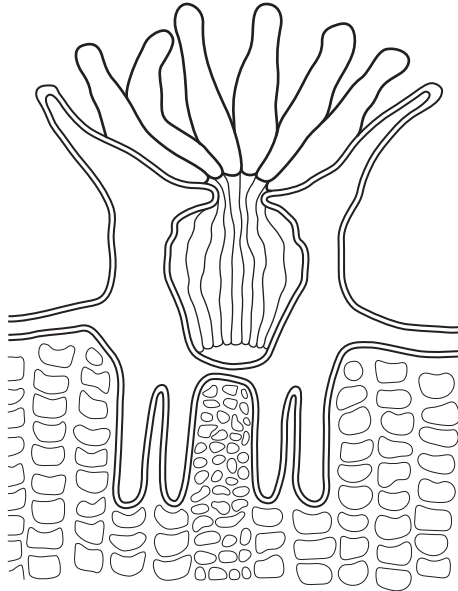


Fig. 3.2

[3]

(ii) Describe the function of nematocysts.

.....

..... [1]

(c) State **three** causes of coral reef erosion.

1

.....

2

.....

3

..... [3]

[Total: 10]



4 (a) Fig. 4.1 shows a pyramid of energy for a marine food chain.

The energy at each level is shown in arbitrary units (a.u.).

The pyramid of energy is **not** to scale.

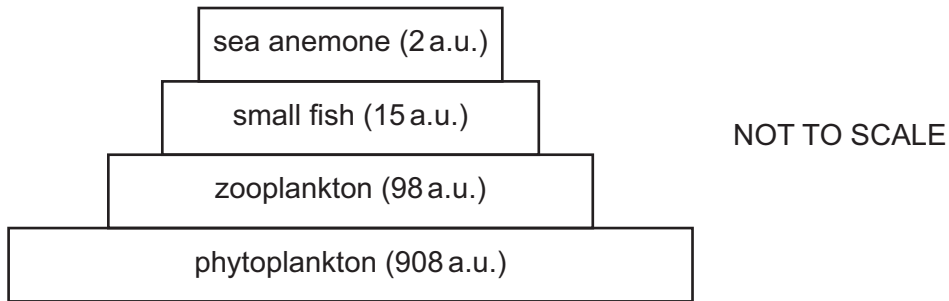


Fig. 4.1

(i) Identify the tertiary consumer in Fig. 4.1.

..... [1]

(ii) Calculate the percentage decrease in energy between trophic levels 2 and 3 in Fig. 4.1.

..... % [2]

(iii) State **three** ways energy is lost between trophic levels 3 and 4 in Fig. 4.1.

- 1
 - 2
 - 3
- [3]





(b) Consumers gain essential elements from the organisms they eat.

Complete Table 4.1 by ticking (✓) the boxes to show **all** the essential elements that are found in each biological molecule.

Table 4.1

essential elements	biological molecule		
	chlorophyll	protein	DNA
nitrogen			
magnesium			
phosphorus			

[3]

[Total: 9]

5 Rocky shores are an example of a habitat found in the littoral zone and have high levels of biodiversity.

(a) Define the term littoral zone.

.....

..... [1]

(b) State the **three** levels of biodiversity.

1

2

3 [3]

(c) Outline the beneficial role of marine organisms in terms of climate control.

.....

.....

.....

.....

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..... [3]

[Total: 7]



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6 Fig. 6.1 is a diagram showing the direction of movement of some tectonic plates.

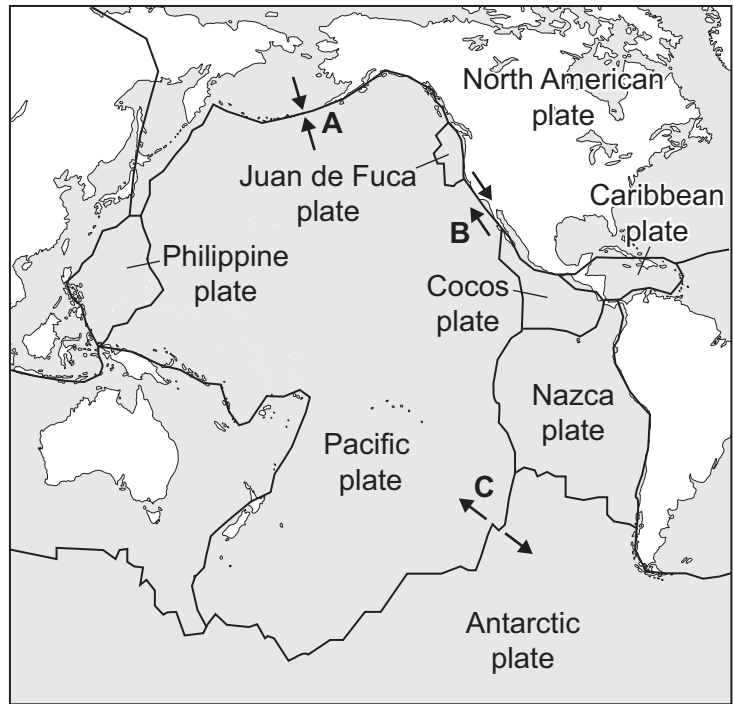


Fig. 6.1

(a) Identify the type of plate boundary labelled **A** and the type of plate boundary labelled **B** in Fig. 6.1.

A

B

[2]

(b) State **one** feature that forms on the ocean floor at the plate boundary labelled **C** in Fig. 6.1.

..... [1]

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(c) Explain how tsunamis form at the plate boundary labelled **A** in Fig. 6.1.

.....

.....

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.....

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.....

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..... [4]

[Total: 7]

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