



## Cambridge O Level

CANDIDATE  
NAME

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NUMBER

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**MARINE SCIENCE**

**5180/01**

Paper 1 Structured

**October/November 2020**

**1 hour 30 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.

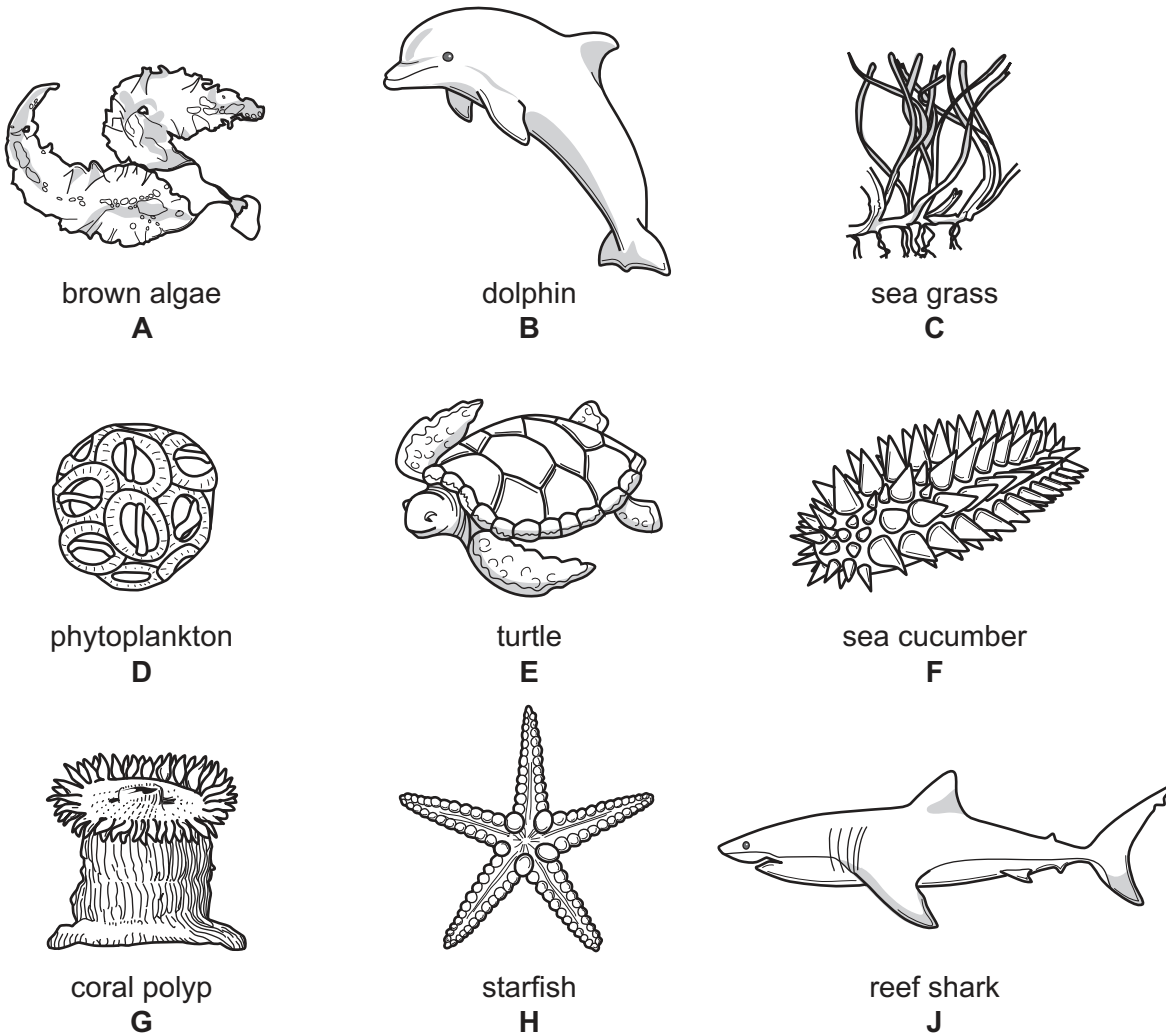
### INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Blank pages are indicated.

Answer **all** the questions in the spaces provided.

1 Fig. 1.1 shows 9 different marine organisms.



not to scale

Fig. 1.1

(a) For organisms **A**, **B** and **C** shown in Fig. 1.1, name the kingdom each organism is in.

**A** .....

**B** .....

**C** .....

[3]

(b) Table 1.1 shows some descriptions of the organisms shown in Fig. 1.1.

For each description, complete the table by writing the letters of **all** the organisms from Fig. 1.1 the description applies to.

Some rows will contain more than one organism.

**Table 1.1**

<b>description</b>	<b>organism(s)</b>
It can photosynthesise.	.....
It is a chordate.	.....
It is a reptile.	.....
It is a flowering plant.	.....
It is a cnidarian.	.....
It has tube feet.	.....

[6]

[Total: 9]

2 (a) Fig. 2.1 shows the structure of the Earth.

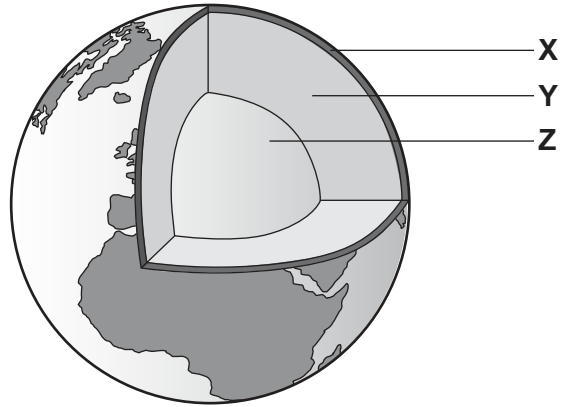


Fig. 2.1

Name the parts labelled X, Y and Z.

X .....

Y .....

Z .....

[3]

(b) Fig. 2.2 shows the land-masses on Earth after it first formed. The continent of Pangaea broke into several smaller continents over millions of years, and they moved to their current locations.



Fig. 2.2

Outline the theory of plate tectonics that caused this movement.

.....

.....

.....

.....

.....

.....

.....

[3]

[Total: 6]

3 (a) Read the passage below about corals, then complete the sentences choosing the correct word from the box. You will **not** use all of the words.

budding	corallite	fertilisation	photosynthesis
stomach	tentacles	zooplankton	zooxanthellae

Some coral polyps produce a hard protective material called ..... .  
Some coral polyps contain symbiotic organisms called ..... which undertake ..... to supply nutrients to the polyps. Coral polyps can also feed on organisms in the water. Their ..... contain stinging cells. These cells are fired out at passing organisms, which are then taken into the ..... for digestion.

[5]

(b) Coral polyps can reproduce either sexually or asexually.

Outline the process of sexual reproduction in coral.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

[Total: 8]

4 (a) Fig. 4.1 shows a drawing of a dissected fish, with three parts labelled **A**, **B** and **C**.

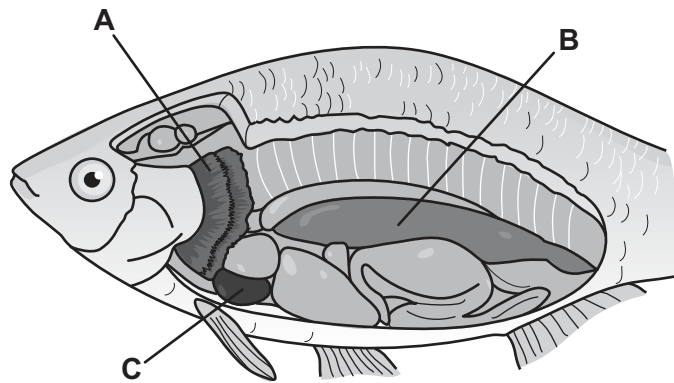


Fig. 4.1

Complete Table 4.1 by stating the names and functions of parts **A**, **B** and **C** labelled in Fig. 4.1.

Some have been stated for you.

Table 4.1

part	name	function
<b>A</b>	.....	.....
<b>B</b>	swim bladder	.....
<b>C</b>	.....	pumps blood around the body

[4]

(b) Suggest why not all species of fish need a swim bladder.

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

(c) Many species of fish shoal.

(i) Describe fish shoaling.

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

(ii) Suggest **two** advantages of shoaling to fish.

1 .....  
.....  
2 .....  
..... [2]

[Total: 8]

5 (a) Explain the meaning of the term *aquaculture*.

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

(b) Aquaculture operations sometimes use polyculture.

In polyculture two or more species are kept together. Placing sea cucumbers below fish cages is an example of polyculture.

Suggest **one** environmental advantage and **one** economic advantage of placing sea cucumbers below fish cages.

environmental advantage .....

.....

economic advantage .....

..... [2]

(c) To improve the growth rate of trout in aquaculture operations, scientists transfer a growth-promoting gene into the fish. This is genetic engineering.

Outline how trout can be genetically engineered to produce fish that contain a new growth-promoting gene.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 7]



6 Table 6.1 shows the four stages in the functioning of a 4-stroke marine diesel engine.

The images are **not** in the correct order.

(a) Complete Table 6.1 as follows: name each stage and complete the order they should come in the functioning of a 4-stroke diesel engine.

**Table 6.1**

	name of stage	stage order
	<p>.....</p>	<p>.....</p>
	<p>.....</p>	<p>.....</p>
	<p>.....</p>	<p>.....</p>
	<p>.....</p>	<p>1</p>

[5]

(b) (i) Describe the method of using drift nets (gill nets) to catch fish.

.....  
.....  
.....  
.....  
.....  
..... [3]

(ii) A disadvantage of using drift nets is that there can be a by-catch.

Suggest the meaning of the term *by-catch*.

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

(c) Fishermen may travel to areas where a Fish Aggregating Device (FAD) is present to increase their catch.

Explain how an FAD increases the fish availability in an area.

.....  
.....  
.....  
.....  
.....  
..... [3]

[Total: 12]

7 (a) Lipids and proteins are two components of a balanced diet.

Name **three** other components of a balanced diet.

- 1 .....
- 2 .....
- 3 .....

[3]

(b) Table 7.1 shows the percentage lipid and percentage protein content of a variety of foods.

**Table 7.1**

food	percentage lipid content	percentage protein content
coconut	71	3
chicken	39	61
shrimp	15	82
tuna	9	91
cod	7	93
rice	7	7
crab	6	93
mango	3	3

Name the **two** foods with the highest percentage protein content shown in Table 7.1.

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

(c) State **one** function of lipids and **one** function of proteins in the human body.

lipids .....

.....

proteins .....

..... [2]

(d) State the name of the smaller units that join together to form proteins.

..... [1]

[Total: 7]

8 (a) Fig. 8.1 shows a pyramid of numbers for a food chain.

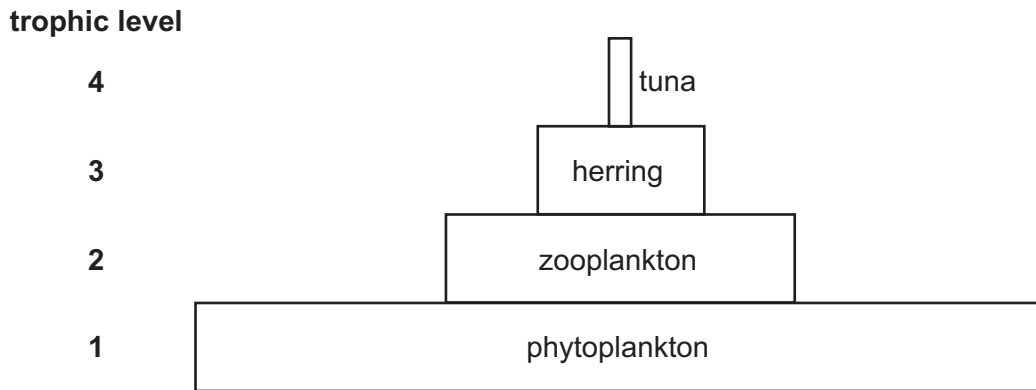


Fig. 8.1

(i) State the initial energy source for the food chain shown in Fig. 8.1.

..... [1]

(ii) State the name of the herbivore shown in Fig. 8.1.

..... [1]

(b) Outline the role of decomposers in nutrient recycling.

.....  
.....  
.....  
.....  
.....  
..... [3]

(c) Table 8.1 shows the energy held in each trophic level.

**Table 8.1**

trophic level	energy/a.u.	loss of energy from previous trophic level/a.u.
1 (phytoplankton)	3687	
2 (zooplankton)	401	3286
3 (herring)	38	363
4 (tuna)	3	.....

(i) Calculate the loss of energy between trophic level **3** and trophic level **4**.

Write your answer in Table 8.1.

[1]

(ii) Name **two** processes that cause the loss of energy between trophic level **3** and trophic level **4**.

1 .....

.....

2 .....

.....

[2]

[Total: 8]

9 (a) State the aim of the Convention on International Trade in Endangered Species (CITES).

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

(b) Suggest and explain **three** different reasons why many species of sea turtles have become endangered.

1 .....  
2 .....  
3 ..... [3]

(c) Many countries have Marine Protected Areas (MPAs) to help conservation of species such as turtles.

Explain what is meant by the term *Marine Protected Area*.

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

[Total: 5]

10 Table 10.1 shows the quantity and value of some skipjack tuna export products from a country.

Table 10.1

tuna product	quantity/kg	value/local currency
salted and dried	127 497	3 899 843
frozen	23 279 911	708 844 632
fresh	13 299	1 925 149
dried	1 326 728	107 245 453

(a) (i) State the tuna product which contributes most to the economy of this country.

..... [1]

(ii) Suggest why fresh tuna is the smallest quantity exported.

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

(b) (i) Suggest **two** factors that a tuna processing company would consider when setting a purchase price for buying fish from local fishermen.

1 .....  
 2 ..... [2]

(ii) Suggest **one** advantage and **one** disadvantage to the tuna processing company if they set a high purchase price to pay fishermen for their fish.

advantage .....  
 .....  
 disadvantage .....  
 ..... [2]

(c) Suggest the impact that a shortage of skipjack tuna has on its price.

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

(d) To expand their business, the tuna processing company wants to develop new international markets.

Explain the term *market* used in this context.

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

[Total: 10]

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