Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

8077872122

MARINE SCIENCE **5180/01**

Paper 1 Structured **October/November 2018**

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

This document consists of **18** printed pages and **2** blank pages.

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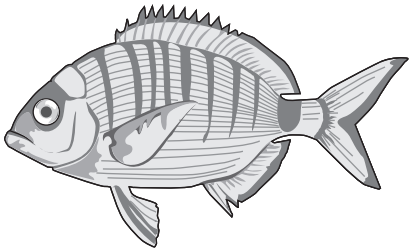
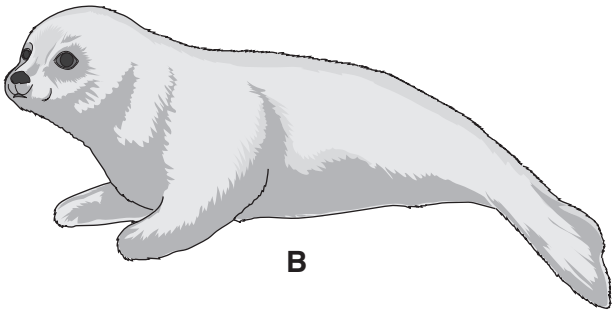
Answer **all** the questions in the spaces provided.

1 **(a)** Fig. 1.1 shows six marine organisms. These images are not drawn to the same scale.



A



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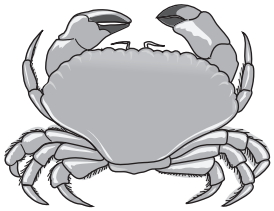
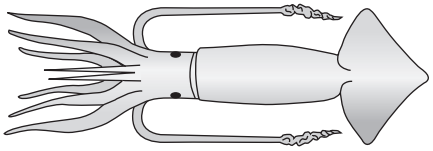


C



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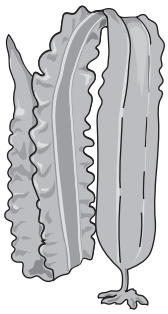

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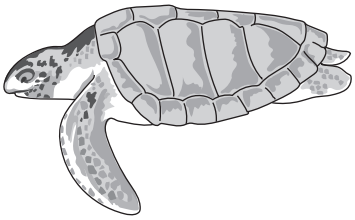

F

Fig. 1.1

Complete Table 1.1 to show the name of the group to which each organism belongs.

Table 1.1

group	letter
mammals	
bony fish	
molluscs	
arthropods	
reptiles	
algae	

[5]

(b) Fig. 1.2 shows the classification of four species of shark.

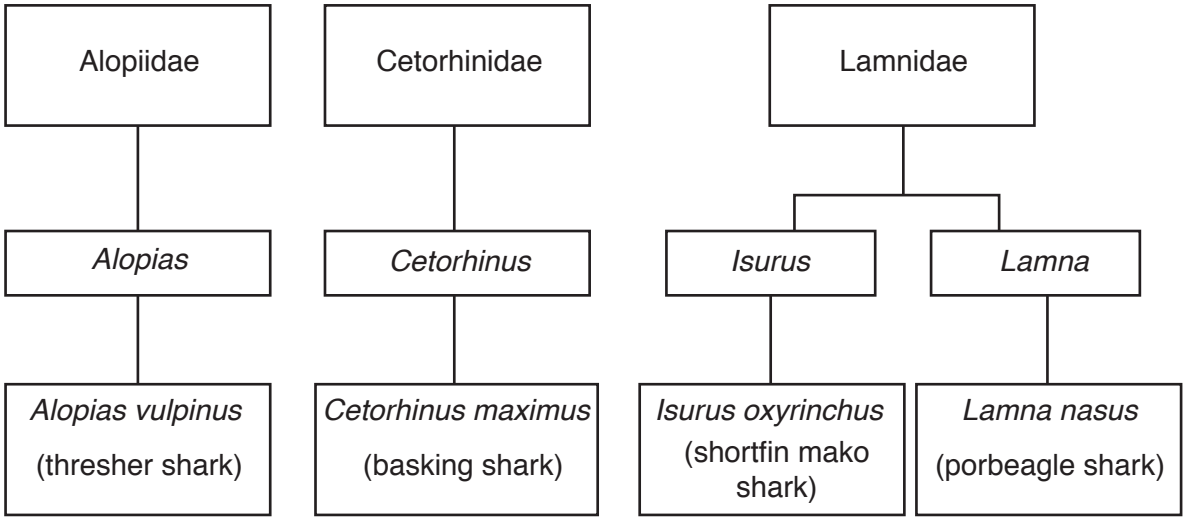

Fig. 1.2

(i) State the name of the genus to which the basking shark belongs.

.....[1]

(ii) State the specific name of the porbeagle shark.

.....[1]

[Total: 7]

2 **(a)** Salmon can be genetically engineered to increase their growth rate.

Explain what is meant by the term *genetic engineering*.

.....

.....

.....

.....[2]

(b) Suggest **two** reasons, other than increased growth rate, for producing genetically engineered organisms.

1 .....

.....

2 .....

.....

[2]

(c) Table 2.1 shows the growth of normal salmon and genetically engineered (GE) salmon on an aquaculture farm.

Table 2.1

days from first feeding	mass/g	
	normal salmon	GE salmon
0	0.2	0.2
50	1.0	2.0
100	4.0	7.0
150	8.0	18.0
200	20.0	46.0
250	48.0	81.0
300	80.0	165.0
350	170.0	290.0
400	290.0	510.0
450	482.0	940.0
500	815.0	1300.0
550	1060.0	2340.0
600	1300.0	4200.0

(i) State the difference in mass between the normal salmon and the GE salmon at 300 days from first feeding.

..... g
[1]

(ii) Compare the time taken for the GE salmon and the normal salmon to reach a mass of 290 g.

.....

.....

.....

.....

.....

.....[3]

(iii) Suggest **two** reasons why this difference in time is an advantage to the owners of the aquaculture farm.

1 .....

.....

2 .....

.....
[2]

(iv) Suggest **one** disadvantage of growing GE salmon.

.....

.....[1]

[Total: 11]

3 **(a)** Fig. 3.1 shows how the temperature of sea water changes between the sea surface and a depth of 1000 m.

The shaded area shows a layer in the ocean known as the thermocline.

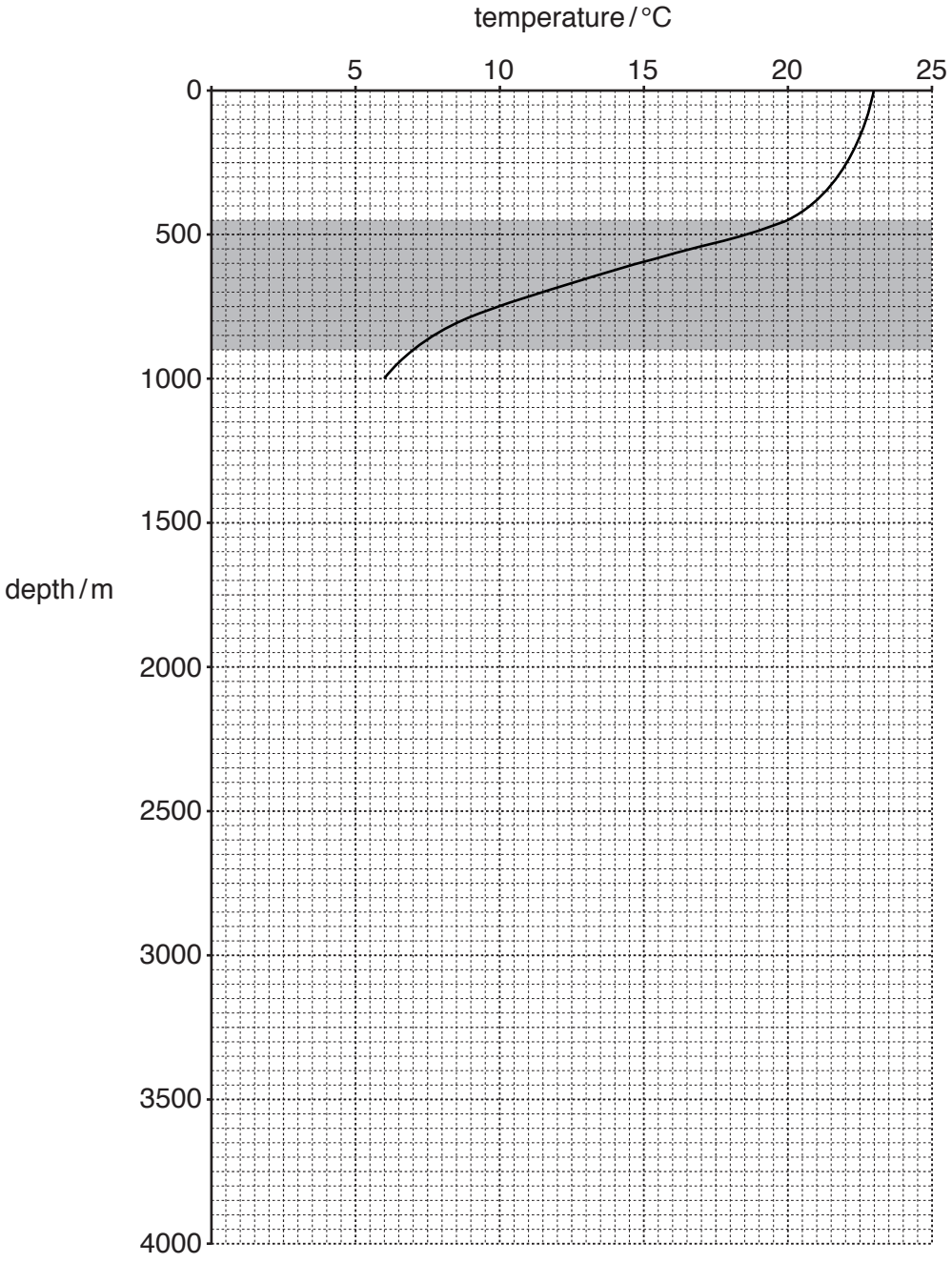

Fig. 3.1

(i) State the depth to which the thermocline extends below sea level. Include the unit.

.....

[2]

(ii) Use the data in Fig. 3.1 to describe what happens to the temperature of the water in the thermocline as the depth increases.

.....

.....

.....

.....[2]

(iii) Complete the line on Fig. 3.1 to show how the temperature changes as the depth increases to 4000 m. [2]

(b) (i) Name the process in which plants use carbon dioxide.

.....[1]

Fig. 3.2 shows how depth of sea water affects the intensity of light penetrating into it (light penetration).

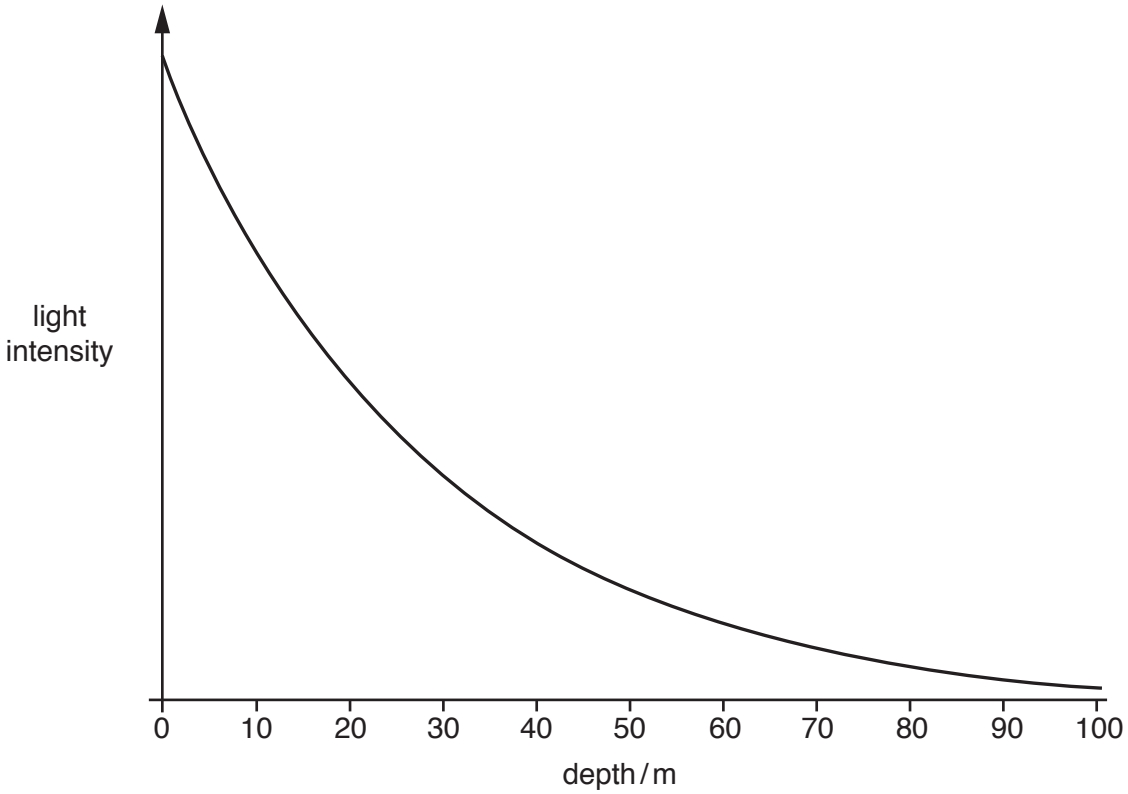

Fig. 3.2

(ii) State the trend shown in Fig. 3.2 between depth of sea water and light intensity.

.....

.....[1]

(iii) Use Fig. 3.2 to explain why the highest number of marine organisms are found in the top 30 m of sea water.

.....

.....

.....

.....

.....

.....[3]

[Total: 11]

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4 **(a)** Suggest what is meant by the term *navigation*.

.....

.....

.....

.....[2]

Fig. 4.1 shows the position of some islands in the Caribbean Sea.

Fig. 4.1

(b) A boat leaves Nicholls Town and sails to High Rock via the most direct route.

It then sails directly from High Rock to Sandy Point before returning directly to Nicholls Town.

Draw, on Fig. 4.1, the route taken by the boat. Include arrows to show the direction. [2]

(c) State the direction in which the boat sails

(i) from Nicholls Town to High Rock.

.....[1]

(ii) from Sandy Point to Nicholls Town.

.....[1]

(d) Name **two** navigational aids on a boat.

1 .....

2 .....
[2]

[Total: 8]

5 **(a)** Table 5.1 shows the nutritional content of three types of fish.

Table 5.1

nutrient	mass/g per 100 g of fish		
	herring	mackerel	horse mackerel
protein	17.50	17.70	18.30
carbohydrate	less than 0.10	2.80	less than 0.10
fat	3.88	23.18	8.73
fibre	less than 0.5	less than 0.5	0.90

(i) State which type of fish contains the most fat.

.....[1]

(ii) State **one** component of a balanced diet which is not shown in Table 5.1.

.....[1]

(b) Processing and preserving fish kills microorganisms and prevents spoilage.

Suggest **one** other reason for processing and preserving fish.

.....

.....[1]

(c) Canning is one method of preserving fish.

Complete the passage using words from the list.

enzymes	**bacteria**	**37 °C**	**oil**	**warmed**
115 °C	**rigor mortis**	**water**	**65 °C**	**putrefaction**

During the process of canning, the fish are gutted and washed with drinking ..... . The fish are placed in cans which are sealed and cooked using steam at a temperature of ..... . This temperature deactivates ..... in the fish and prevents ..... . The sealed cans are cooled and packed.

[4]

[Total: 7]

6 Fig. 6.1 shows a Dublin Bay prawn, a decapod crustacean.

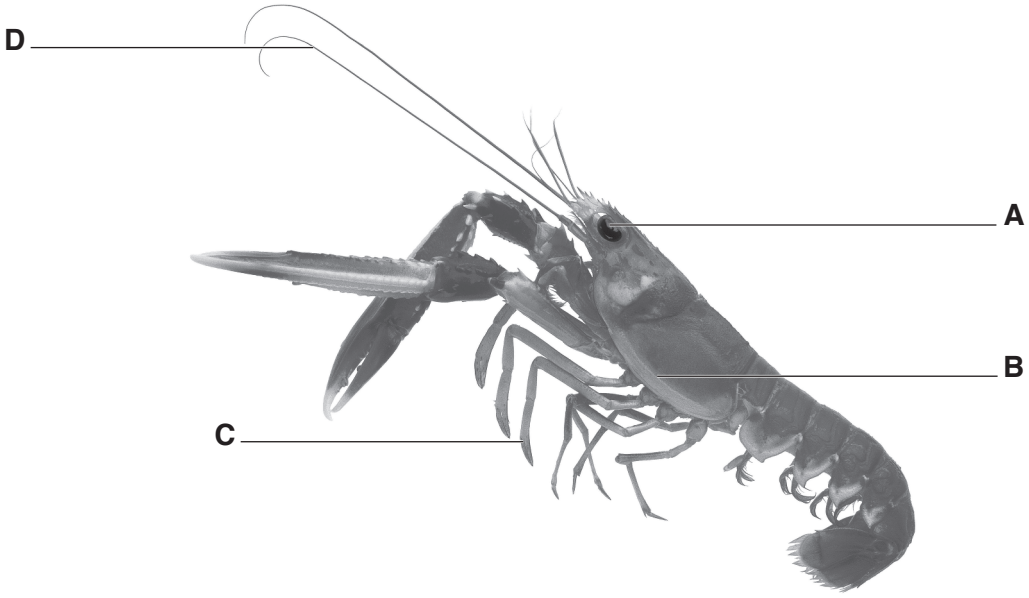


Fig. 6.1

(a) (i) Name the parts labelled **A**, **B**, **C** and **D**.

A .....

B .....

C .....

D .....

[4]

(ii) Identify, and label on Fig. 6.1, the abdomen. [1]

(b) Describe the life cycle of a decapod crustacean, such as the Dublin Bay prawn.

.....

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 9]

7 **(a)** One of the aims of the management of the fisheries industry is the protection of fisheries resources.

(i) State **two** other aims of fisheries management.

1 .....

.....

2 .....

.....

[2]

(ii) Describe how fisheries practices are regulated and enforced.

.....

.....

.....

.....[2]

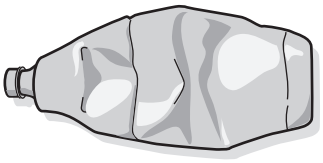
(b) State the main aim of the Marine Stewardship Council.

.....

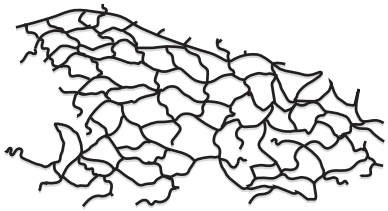
.....[1]

[Total: 5]

8 Fig. 8.1 shows some items of litter which pollute the marine environment.

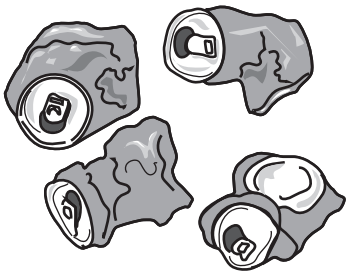


plastic bottles



fishing nets

tyres



metal cans

Fig. 8.1

(a) Describe ways, other than producing litter, in which humans can pollute the marine environment.

.....

.....

.....

.....

.....

.....[3]

(b) Ghost nets are fishing nets that have been lost in the ocean. Most modern nets are made from plastic, an artificial material.

These nets do not break down easily in the sea.

Fig. 8.2 shows a turtle trapped in a ghost net.

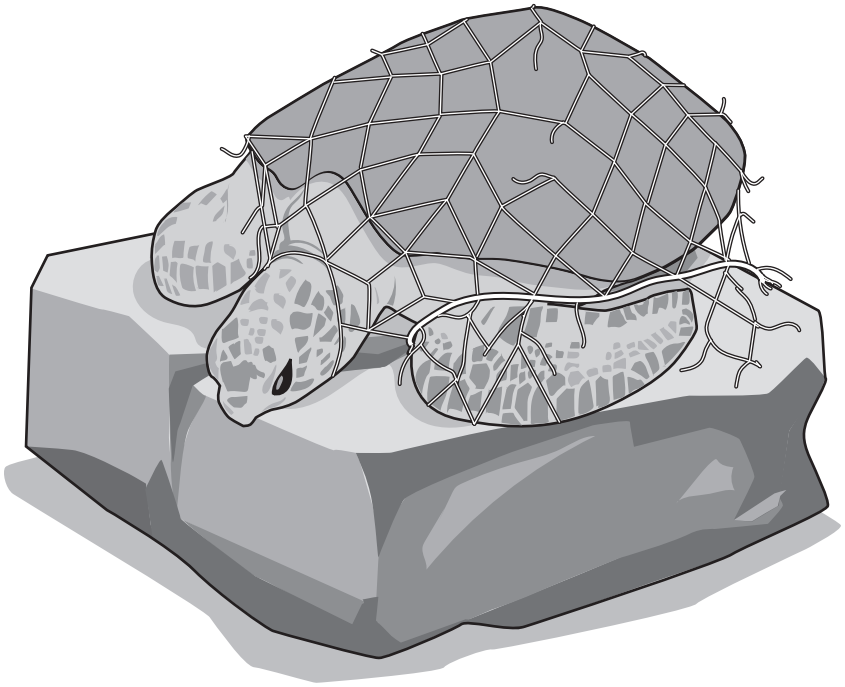


Fig. 8.2

(i) Suggest **two** ways that ghost nets may kill turtles.

1 .....

.....

2 .....

.....

[2]

(ii) Suggest reasons why using nets made from plastic is of benefit to fishermen.

.....

.....

.....

.....[2]

(c) Describe how drift nets are used to catch fish.

.....

.....

.....

.....

.....

.....[3]

[Total: 10]

9 **(a)** Identify the parts of the marine environment in which most fisheries are found.

Draw a circle around the **three** parts.

hydrothermal vents **abyssal plains** **ocean trenches**

lagoons **coral reefs** **continental shelves**

[2]

(b) Name **two** international fisheries resources.

1 .....

2 .....

[2]

(c) Many fisheries resources are overexploited.

Explain what is meant by the term *overexploitation*.

.....

.....

.....

.....[2]

[Total: 6]

10 (a) Explain the meaning of the following terms:

(i) *barter*

.....

.....

.....

.....[2]

(ii) *a market*

.....

.....[1]

(b) Complete Table 10.1 by matching the term to the correct definition.

Choose the terms from this list.

unlimited wants **choice** **regulators**

resources **opportunity cost** **trade**

Table 10.1

definition	term
the desire to want more things than we need	
what we use to produce goods and services	
the loss of potential gain from other alternatives when one alternative is chosen	

[3]

[Total: 6]

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