



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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MARINE SCIENCE

5180/01

Paper 1

For Examination from 2014

SPECIMEN PAPER

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 the work you hand in.

Write in dark blue or black pen.

You may use a pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

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.

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1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

This document consists of **13** printed pages and **1** blank page.



1 Tides occur in the oceans and in most seas.

(a) Explain how tides are caused.

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

(b) Explain what is meant by each of the following terms.

(i) spring tide

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

(ii) neap tide

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

(c) In the space below, draw the Earth as seen in section. Label the *core*, *mantle* and *crust*.

[4]

[Total: 8]

2 When fish is frozen, heat is extracted, which lowers the temperature of the fish. Heat continues to be extracted until almost all the water is solidified.

(a) Fig. 2.1 shows the percentage of water frozen at different temperatures in fish muscle. Label the axes with suitable titles.

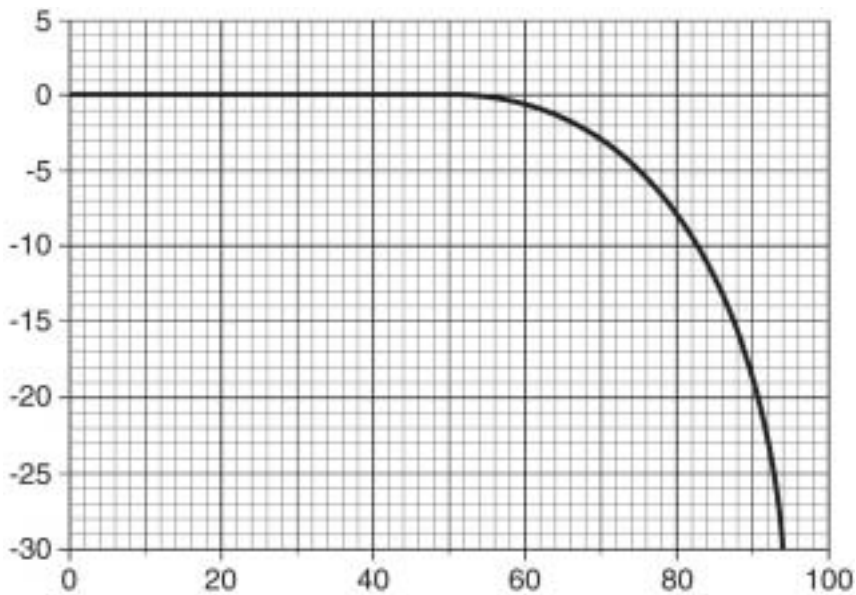


Fig. 2.1

[2]

(b) Use Fig. 2.1 to find each of the following.

(i) The percentage of water frozen at $-15\text{ }^{\circ}\text{C}$.

..... [1]

(ii) The temperature at which 80% of the water is frozen.

..... [1]

(c) State **one** factor that lowers the temperature at which the water in fish begins to freeze.

..... [1]

(d) Suggest **two** changes that would occur in a fish if it were kept at a temperature higher than $-30\text{ }^{\circ}\text{C}$.

1

2

[2]

[Total: 7]

3 (a) Bacteria are prokaryotic organisms. State what is meant by the term *prokaryotic*.

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

(b) The descriptions A to E below give external features of five phyla of animals.

- A radially symmetrical animals with a hollow, sac-like body, a single opening, the mouth is surrounded by a ring of tentacles
- B animals with a hard exoskeleton and jointed legs
- C animals with 5-fold symmetry, spines and tube-feet
- D animals with a soft, unsegmented body, a head and a muscular foot, most have a hard shell
- E bilaterally symmetrical animals with a post-anal tail, some have gills slits

Complete Table 3.1 by matching each description to one of these phyla by writing the correct letter next to it.

Table 3.1

phylum	letter
Arthropods	
Chordates	
Cnidaria	
Echinoderms	
Molluscs	

[5]

(c) Many animals are predators. Define the term *predator*.

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

[Total: 8]

4 Several species of turtles can be found in the Indian Ocean, including the green and leatherback turtles. All of these are endangered species.

(a) Explain what is meant by the term *endangered species*.

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

(b) Suggest why some islands have been left as sanctuaries for turtles.

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

(c) Suggest **two** conservation methods, other than using island sanctuaries, to protect turtle populations for the future.

1
2 [2]

(d) Name **two** endangered species, other than turtles, found in the Indian Ocean.

1
2 [2]

[Total: 7]

- 5 Sea cucumbers (*beche-de-mer*) are exported from the Maldives.

Table 5.1 shows the mean export price (in US dollars) per kg of sea cucumbers for the years 1986 to 1994.

Table 5.1

year	mean price / US dollars per kg
1986	5.52
1987	7.14
1988	5.54
1989	2.99
1990	3.29
1991	3.94
1992	5.49
1993	7.04
1994	5.90

- (a) Use Table 5.1 to find each of the following.

- (i) The year with the highest mean export price per kg.

..... [1]

- (ii) The year with the lowest mean export price per kg.

..... [1]

- (b) Suggest **two** reasons why the mean export price is low in some years.

1

2 [2]

(c) Table 5.2 shows the relative abundance of six commercially important species of sea cucumbers, in the sea surrounding 10 islands in the Indian Ocean.

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Table 5.2

species	island									
	1	2	3	4	5	6	7	8	9	10
<i>T. ananas</i>	–	--	–	--	–	–	--	--	--	–
<i>M. nobilis</i>	+	–	–	--	–	–	–	–	--	--
<i>A. mauritania</i>	+	–	--	+	–	–	–	+	+	–
<i>S. chloronotus</i>	++	++	+	+	++	+	+	++	+	++
<i>B. marmorata</i>	+	–	+	+	+	+	–	–	–	+
<i>H. atra</i>	++	++	++	++	++	++	++	++	++	++

Key: ++ very common
+ common
– rare
-- very rare

Using the information in Table 5.2, name each of the following.

(i) The most common species of sea cucumber.

..... [1]

(ii) The rarest species of sea cucumber.

..... [1]

(d) Suggest **two** ways in which sea cucumber populations could be protected from over exploitation.

1

2 [2]

[Total: 8]

6 Fins help a fish to control its movement through the water. Some fins are single fins in the midline of the fish, others are paired.

(a) Name the paired fins found on a fish.

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

(b) Name the fins that control each of the following.

(i) yawing

..... [1]

(ii) pitching

..... [1]

(iii) rolling

..... [1]

(c) Many species of fish have a swim bladder, which helps to maintain buoyancy. However, some species of tuna do not have a swim bladder. Suggest how these species of tuna maintain buoyancy in the sea.

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

[Total: 7]

7 (a) Read the passage below about the greenhouse effect and global warming.

Complete the passage using words from the list below.

- atmosphere
 - carbon dioxide
 - cools
 - infra-red
-
- sulfur dioxide
 - ultra-violet
 - warms

When sunlight travels to the Earth, it passes through the

The sunlight the ground which sends out
..... radiation.

Gases such as in the air trap some of the radiation
and this keeps the Earth hotter than normal. [4]

(b) Suggest **two** possible effects global warming may have on low-lying countries such as the Maldives and Bangladesh.

1

2

[2]

[Total: 6]

8 (a) Name **three** materials used to make the hulls of fishing boats.

- 1
- 2
- 3 [3]

(b) Many traditional fishing boats were small, with sails. Most modern fishing boats are larger and mechanised.

Suggest **two** advantages of mechanised fishing boats, compared with traditional fishing boats.

- 1
- 2 [2]

(c) Now that large, mechanised fishing boats are used, it is necessary for islands to have modern harbours.

State **four** functions of a modern harbour.

- 1
- 2
- 3
- 4 [4]

[Total: 9]

9 Fig. 9.1 shows part of a marine food web.

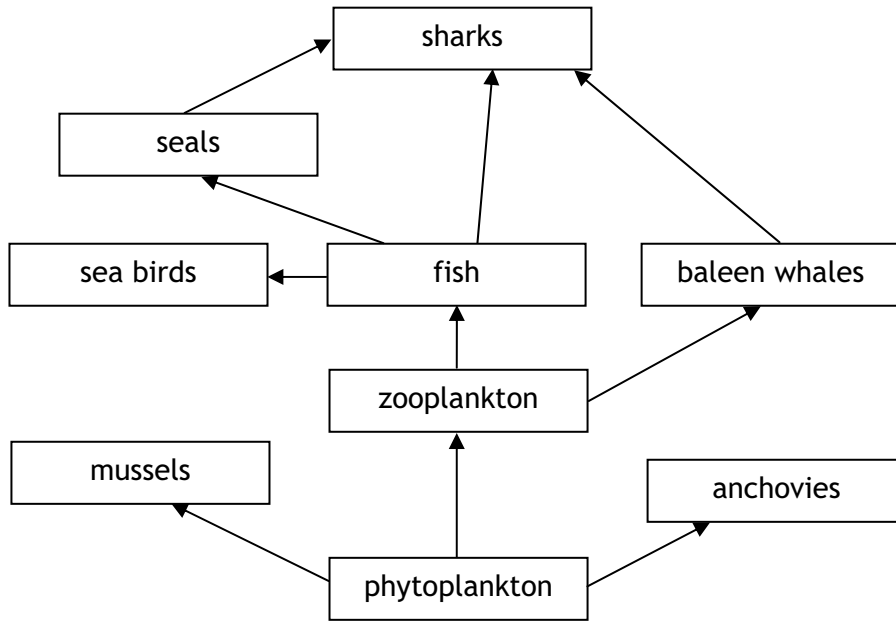


Fig. 9.1

(a) (i) State the energy source for this food web.

..... [1]

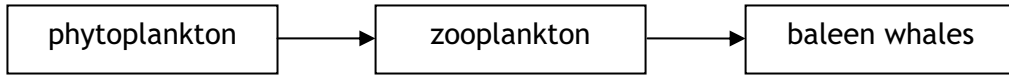
(ii) Explain the role of phytoplankton in this food web.

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

(iii) Explain what the arrows in this food web represent.

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

(iv) In the space below, draw and label a pyramid of numbers for the following food chain.



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[2]

(b) In a food chain, only about 10% of the energy passes from one trophic level to the next. Explain why energy is lost in a food chain.

.....

.....

.....

.....

.....

.....

.....

[3]

[Total: 11]

10 (a) Explain what is meant by the term *aquaculture*.

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

(b) Aquaculture has a number of advantages and disadvantages when compared to fish methods that catch wild stock.

(i) Give **one** advantage of aquaculture.

..... [1]

(ii) Give **one** disadvantage of aquaculture.

..... [1]

(c) Name **two** types of aquatic organisms, other than the Nile tilapia, that are produced by farming.

1
2 [2]

(d) Suggest **one** reason why the Nile tilapia is a suitable species for production by farming.

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

[Total: 9]

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