

CANDIDATE  
NAME

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**MARINE SCIENCE**

**5180/01**

Paper 1 Structured Questions

**October/November 2014**

**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 **15** printed pages and **1** blank page.

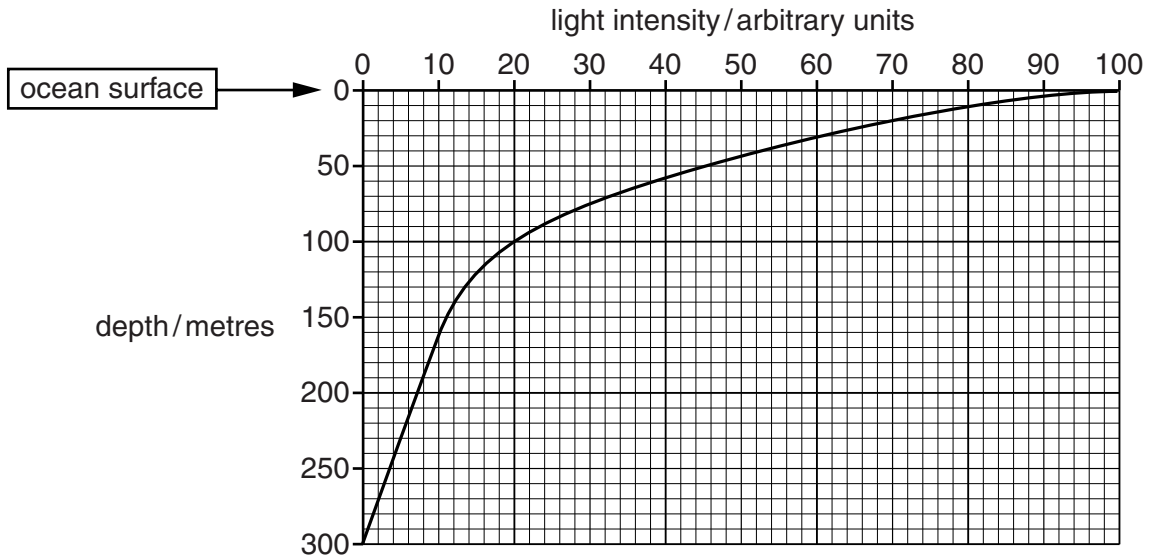
Answer **all** questions in the spaces provided.

1 Marine plants use the process of photosynthesis to make their own food.

(a) Describe the process of photosynthesis.

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

(b) Fig. 1.1 shows the relationship between depth and light intensity in the ocean.



**Fig. 1.1**

(i) Describe the change in the light intensity between the ocean surface and a depth of 120 metres.

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

(ii) Suggest **two** reasons for the change in light intensity with depth.

1 .....

.....

2 .....

..... [2]

(c) Suggest why marine animals are most abundant in the top 100 metres of the ocean.

.....

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

2 (a) Fig. 2.1 shows a virus.

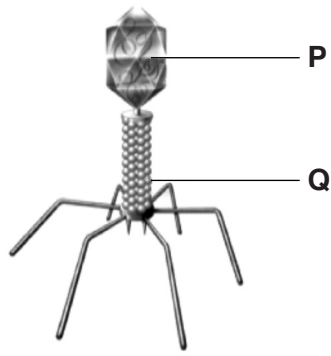


Fig. 2.1

Name the parts labelled **P** and **Q**.

**P** .....

**Q** .....

[2]

(b) Bacteria are involved in food spoilage. Fig. 2.2 shows a bacterium.

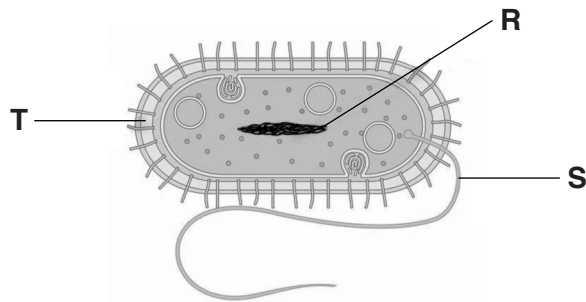


Fig. 2.2

Name the parts labelled **R**, **S** and **T**.

**R** .....

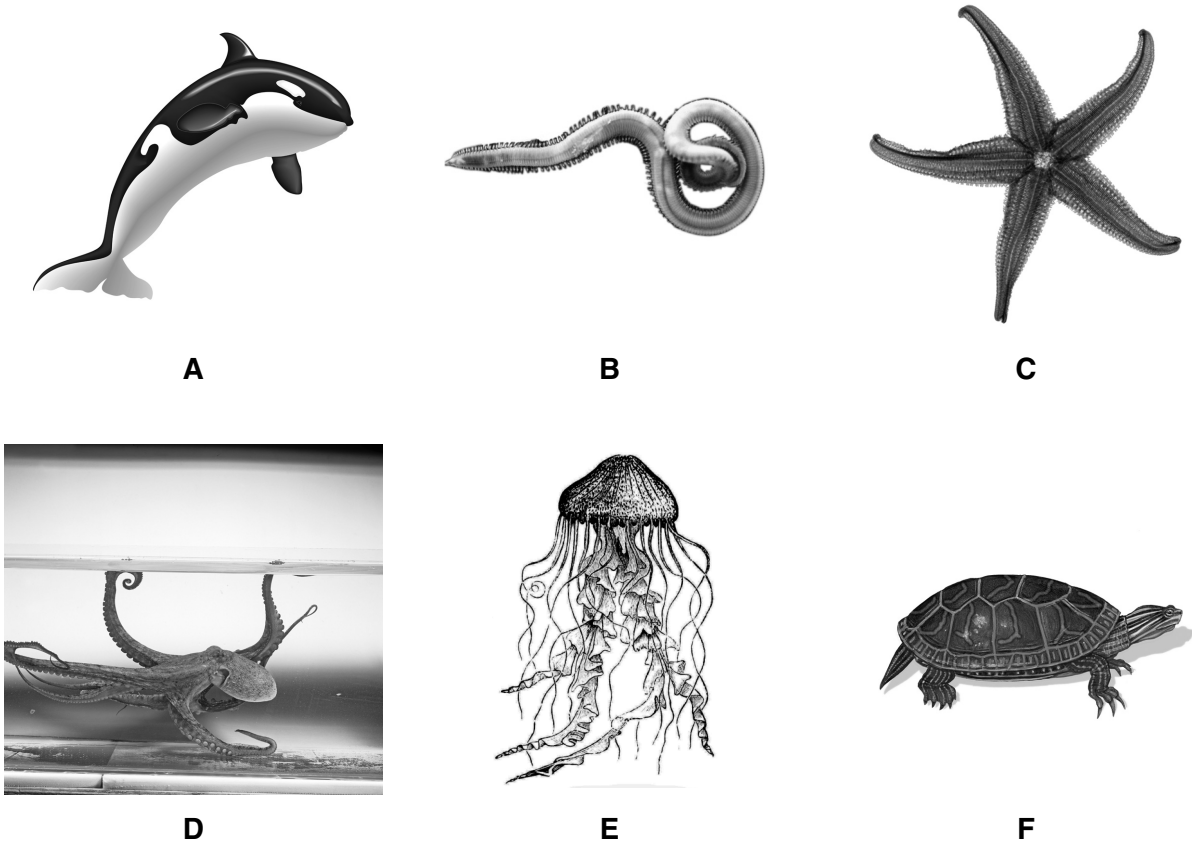
**S** .....

**T** .....

[3]



3 Fig. 3.1 shows six marine animals. (Animals are not drawn to the same scale.)



**Fig. 3.1**

(a) Match the letter of the animal shown in Fig. 3.1 with the name of the group.

name of group	letter of animal
mammal	
reptile	
cephalopod	
cnidarian	
echinoderm	
annelid	

[6]

(b) (i) State the letters of the animals in Fig. 3.1 that live on the sea bed.

..... and .....

[2]

(ii) State the letter of an animal in Fig. 3.1 that has stinging cells.

.....

[1]

[Total: 9]



(b) (i) Fishing can result in a by-catch.  
Suggest what is meant by the term *by-catch*.

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

(ii) Suggest how the by-catch from using fishing gear **B** may be reduced.

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

(c) Suggest how fishing gear **B** may damage the marine environment.

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

[Total: 11]



5 (a) Table 5.1 shows the nutrients present in the flesh of several marine animals.

Table 5.1

animal	carbohydrate content / grams per 100 grams	lipid content / grams per 100 grams	protein content / grams per 100 grams	mineral salt content / mg per 100 grams
cod	0.0	0.8	16.8	441
oysters	5.0	3.4	8.4	437
tuna	0.0	1.3	21.9	520
lobsters	0.8	0.5	14.2	620
salmon	0.0	3.2	20.1	485
halibut	0.0	1.6	19.3	560
trout	0.0	5.0	16.8	405
pollock	0.0	0.9	16.8	480
crab	0.0	0.8	16.8	630
shrimp	0.0	1.3	17.6	460

(i) Name the **two** animals with the highest protein content.

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

(ii) Name the **two** animals with the lowest mineral salt content.

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

(iii) Calculate the mean lipid content of the animals in Table 5.1.  
Show your working.

mean lipid content = ..... grams per 100 grams [2]

(b) Name **two** components of a balanced diet, other than those given in Table 5.1.

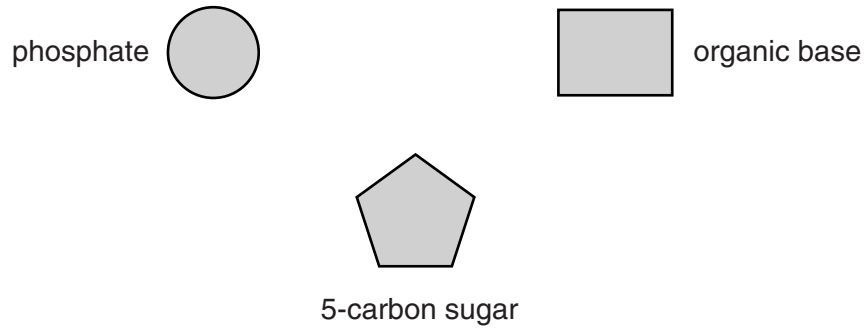
1 .....

2 .....[2]

(c) (i) Name **one** nucleic acid.

.....[1]

(ii) Nucleic acids are made up of mononucleotides. Fig. 5.1 shows the component parts of a mononucleotide.



**Fig. 5.1**

Draw **two** lines to show how these components are linked together to form a mononucleotide. [2]

[Total: 9]

6 (a) State what is meant by a *tsunami*.

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

(b) Table 6.1 gives some information about waves caused by wind and tsunami waves.

**Table 6.1**

wave cause	mean speed / km per hour	mean height near shore / m	near shore features
wind	40	2	slow rising confined to coast no damage caused
tsunami waves	320	30	fast rising travels far inland considerable damage caused

(i) Calculate the difference in the distance travelled in 12 hours by the wind wave and the tsunami wave.  
 Show your working.

difference in distance = ..... km [2]

(ii) Suggest some of the types of damage that may be caused by a tsunami.

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

[Total: 6]

7 Fig. 7.1 shows the catch of Atlantic cod from 1950 to 2000.

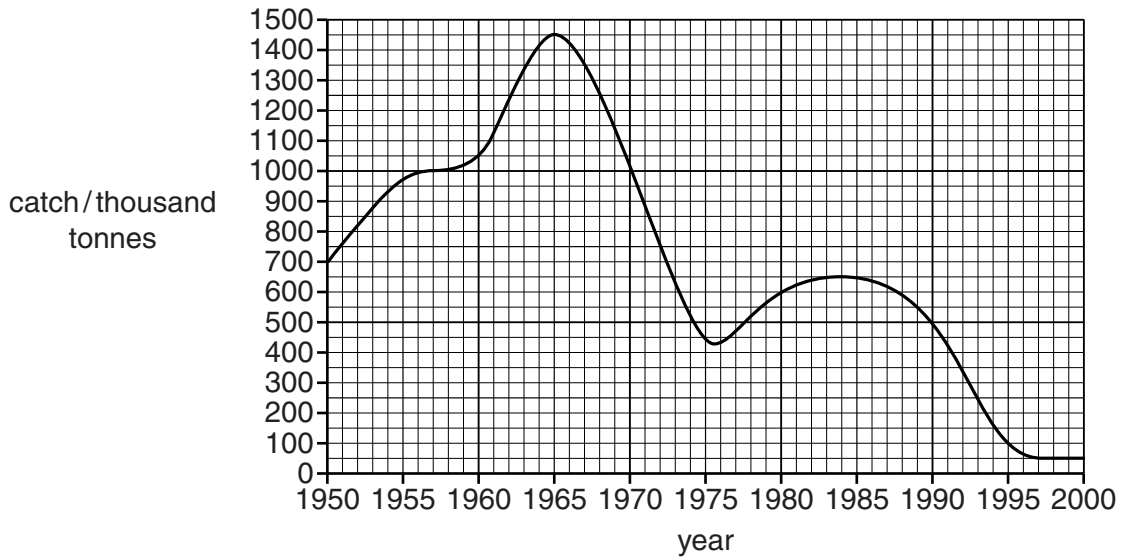


Fig. 7.1

(a) (i) State the catch of Atlantic cod in 1960.

.....[2]

(ii) Describe the changes in the catch of Atlantic cod between 1965 and 1995.

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

(b) Suggest **two** reasons for the change in the catch of Atlantic cod between 1965 and 1975.

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

[Total: 7]

8 Fig. 8.1 shows a magnified view of the head of a sea cucumber (beche-de-mer).

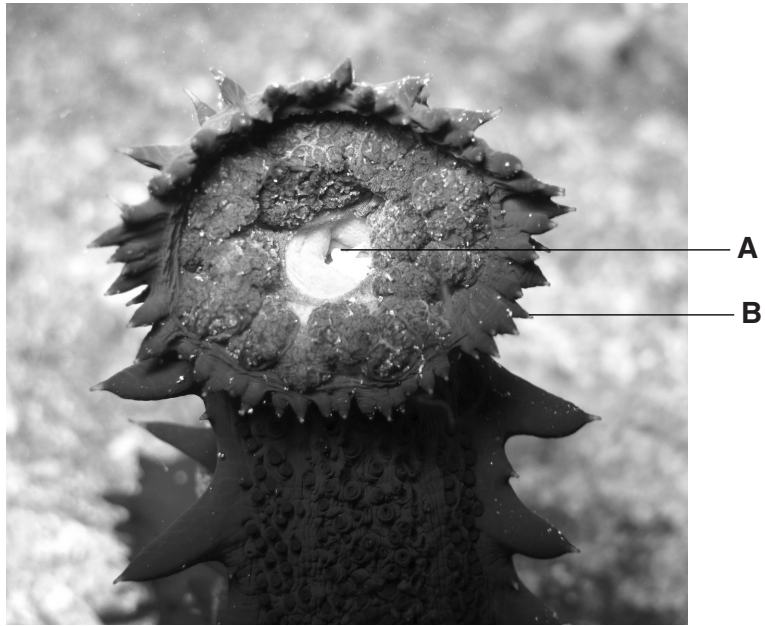


Fig. 8.1

(a) (i) Name the part labelled **A** .....[1]

(ii) State the name and function of the part labelled **B**.

name .....

function .....

.....[2]

(b) Describe the life cycle of a sea cucumber.

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

[Total: 7]

9 (a) Producers and consumers are two groups of people involved in economics. State what is meant by each of the following terms used in economics.

(i) *producers* .....  
.....[1]

(ii) *consumers* .....  
.....[1]

(b) (i) Suggest what would happen to the price of goods such as Maldivian fish if the supply is more than the demand.

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

(ii) The term equilibrium is used in economics. State what is meant by the term *equilibrium*.

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

[Total: 5]

10 (a) State what is meant by the term *pollution*.

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

(b) The following is a statement from the Maldives Ports Limited about the regulation of pollution.

**Government regulation of Pollution**

Notice is hereby given that it is expressly forbidden for any vessel to dump or discharge into any harbour, lagoon or into any part of the waters of the Republic of Maldives: refuse, bunker oil, sewage, noxious substances or any material or substances whatsoever.

The Master of any vessel and/or its agents will be held directly responsible for any nature or degree of pollution of the water, lagoons and islands of the Republic of Maldives through the dumping or discharge of any refuse and/or substance.

In the event of any nature or degree of pollution of Territorial Waters of the Republic of Maldives due to the dumping or discharge of refuse and/or substance, the master and/or the Agent of the offending vessel shall be subject to an immediate fine deemed by the Authority concerned according to Maldivian Law.

(i) Name **two** pollutants referred to in this passage.

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

(ii) Using information in the statement, explain how pollution by ships is regulated.

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

(iii) Pollutants include heavy metals such as lead. Describe the effect of heavy metals on the marine environment.

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

[Total: 6]

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- Question 8      © Ref: C009/3045; Alain Barrere / Look at Sciences / Science Photo Library; *Sea cucumber. Close-up of a sea cucumber (Stichopus chloronotus) on the sea-floor. Photographed off Reunion Island, Indian Ocean*; www.sciencephoto.com.
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