Cambridge
O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER
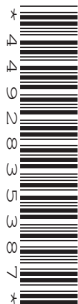
MARINE SCIENCE **5180/01**

Paper 1 Structured **October/November 2017**

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.

CAMBRIDGE
International Examinations

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1   Fig. 1.1 shows the external features of an Atlantic bluefin tuna, *Thunnus thynnus*.
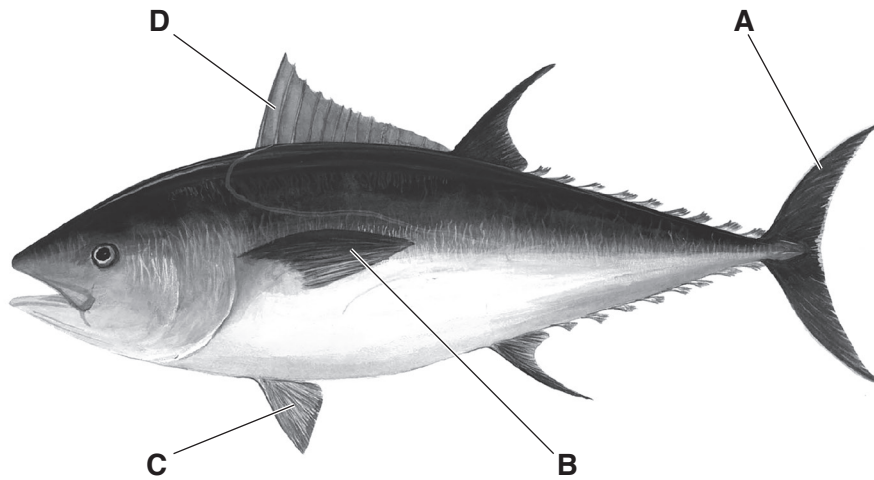
Fig. 1.1

(a) Name the phylum and genus to which this species of tuna belongs.

phylum ....

genus ....

[2]

(b) Name the fins labelled **A**, **B**, **C** and **D**.

A ....

B ....

C ....

D ....

[4]

(c) State the function of the fin labelled **A**.

....

....[1]

(d) State the function of the fin labelled **D**.

....

....[1]

(e) (i) State **one** function of the swim bladder.

....

....[1]

(ii) Some species of tuna do not possess a swim bladder.

Suggest why these species do not need a swim bladder.

....

....

....

....[2]

[Total: 11]

2 Fig. 2.1 shows part of a mangrove forest habitat.

Fig. 2.1

(a) State **two** features of a mangrove forest habitat.

1 ....

....

2 ....

....

[2]

(b) Fig. 2.2 shows the position of a mangrove forest along a shoreline.

Fig. 2.2

With reference to Fig. 2.2, explain how mangrove forests help protect coastal communities.

....

....

....

....

....

....[3]

(c) Table 2.1 shows the changes in the area of mangrove forest in several states in Malaysia between 1980 and 2003.

Table 2.1

state	mangrove area / hectares		change in mangrove area / hectares
	1980	**2003**	
Johor	26 619	17 029	−9 590
Selangor	28 243	13 153	−15 090
Pahang	2 469	2 675	+206
Kedah	9 037	7 949	−1 088
Perak	40 869	41 302	+433
Penang	406	451	+45
Negeri Sembilan	1 352	204	−1 148
Sarawak	44 491	73 000	+28 509
Sabah	349 773	325 000	−24 773

(i) Name the **two** states where the loss of mangrove area was smallest.

1 ....

2 ....
[2]

(ii) Calculate the total decrease in mangrove area between 1980 and 2003.

Show your working.

.... hectares
[2]

[Total: 9]

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3 **(a)** Fig. 3.1 shows six marine organisms. The images are not to the same scale.
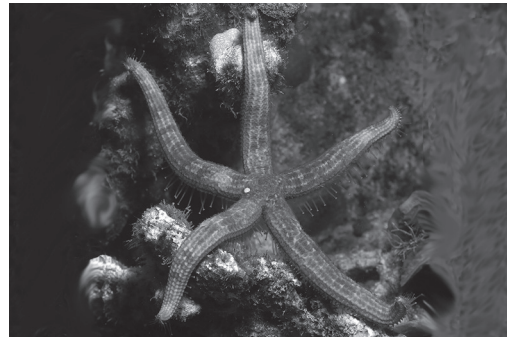

A

B

C

D

E

F

Fig. 3.1

Table 3.1 describes one feature of each of the organisms.

Match the letter of the organism to the feature. Write your answers in Table 3.1.

Table 3.1

feature	letter
has an operculum	
has an exoskeleton	
has a body covered with fur	
has a cartilaginous skeleton	
has stinging cells	
has tube feet	

[6]

(b) State the purpose of using a dichotomous key.

....

....[1]

[Total: 7]

4 Table 4.1 shows the value of import and export between the Maldives and the United States of America for each month in 2013.

Table 4.1

month	export value / millions of US dollars	import value / millions of US dollars	value of trade balance / millions of US dollars
January	1.9	3.2	−1.3
February	4.5	1.4	+3.1
March	1.6	2.7	−1.1
April	1.7	1.6	+0.1
May	2.2	1.0	+1.2
June	2.4	0.8	+1.6
July	1.7	0.9	+0.8
August	2.0	1.5	+0.5
September	1.2	1.9	−0.7
October	5.9	1.9	+4.0
November	1.6	1.9	−0.3
December	2.1	1.6	+0.5
TOTAL	28.8	....	....

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

....

....[1]

(b) State the number of months in which the import value was greater than the export value.

....[1]

(c) State the month with the smallest positive value of trade balance.

....[1]

(d) Complete Table 4.1 by calculating each of the following.

   (i) the total import value [1]

   (ii) the total value of trade balance [1]

(e) State **two** factors that influence international trade.

   1 ....

   2 ....
   [2]
   [Total: 7]

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

....

....

....

....[2]

(b) Fig. 5.1 shows how the dissolved oxygen content changes in the fish tanks of an aquaculture farm when the mass of fish food is increased.
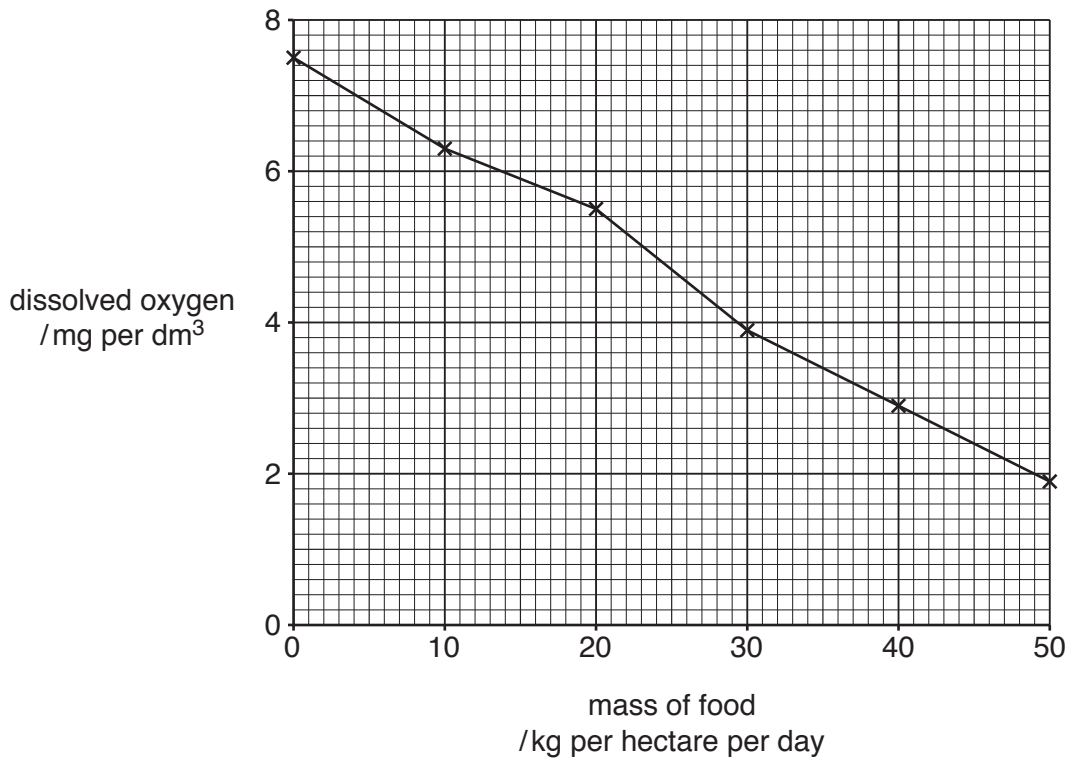
Fig. 5.1

(i) Calculate the change in the dissolved oxygen content when the mass of food is increased from 10 kg per hectare per day to 30 kg per hectare per day.

Show your working.

.... mg per dm^3

[2]

(ii) Use Fig. 5.1 to state the relationship between the mass of food given and the dissolved oxygen content of the water.

....

....[1]

[Turn over

(iii) Suggest an explanation for this relationship.

....

....

....

....[2]

[Total: 7]

6 **(a)** Fig. 6.1 shows the nutrient composition of five species of fish.
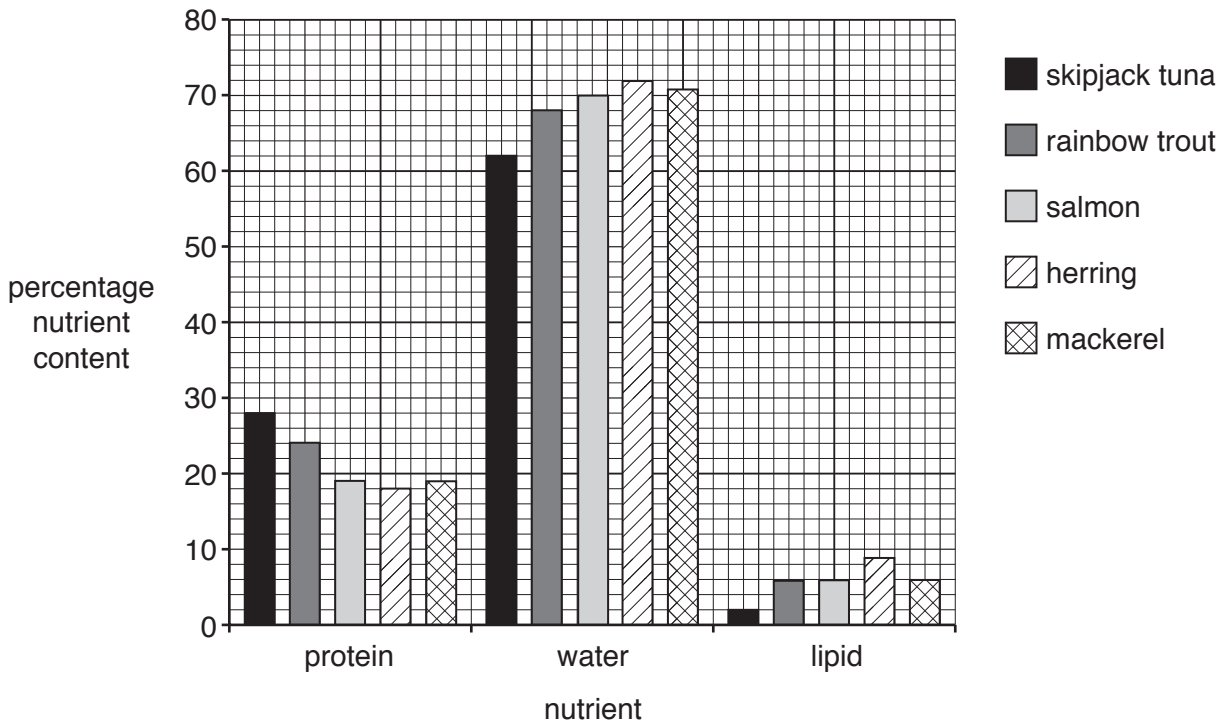
Fig. 6.1

(i) State the difference between the lipid content of skipjack tuna and herring.

....%
[1]

(ii) State the **two** fish that have the same protein content.

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

(b) Describe the function in the body of each of the following.

(i) lipid ....

....[1]

(ii) protein ....

....[1]

(c) Name **two** nutrients present in fish that are not shown in Fig. 6.1.

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

[Total: 6]

7 Fig. 7.1 shows a fish aggregating device (FAD) in the Indian Ocean.
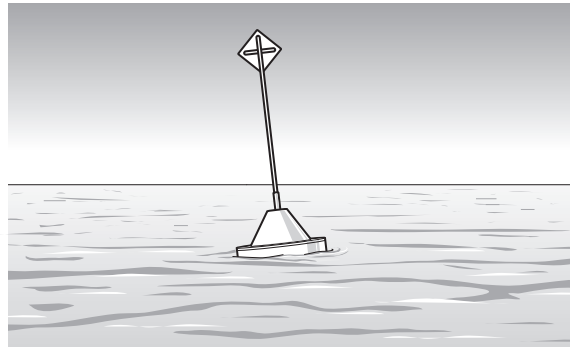
Fig. 7.1

(a) (i) Explain the principle of an FAD.

....

....

....

....[2]

(ii) Explain how the use of FADs is beneficial to fishermen.

....

....

....

....[2]

(b) Suggest why some nations do not allow large-scale fishing with nets near to FADs.

....

....

....

....

....

....[3]

[Total: 7]

8 Many fish are processed and preserved immediately after they are caught.

(a) (i) Explain the importance of fish processing.

....

....

....

....

....

....[3]

(ii) Name the method of food processing which kills microorganisms in the fish using heat.

....[1]

(b) Describe how irradiation is used to preserve fish.

....

....

....

....

....

....[3]

(c) Explain what is meant by the term *rancidity*.

....

....

....

....

....

....[3]

[Total: 10]

9 **(a)** Define each of the following terms.

(i) *herbivore* ....

....[1]

(ii) *carnivore* ....

....

....[1]

(iii) *population* ....

....

....

....

....

....[3]

(b) Fig. 9.1 shows some of the abiotic factors that affect marine organisms.
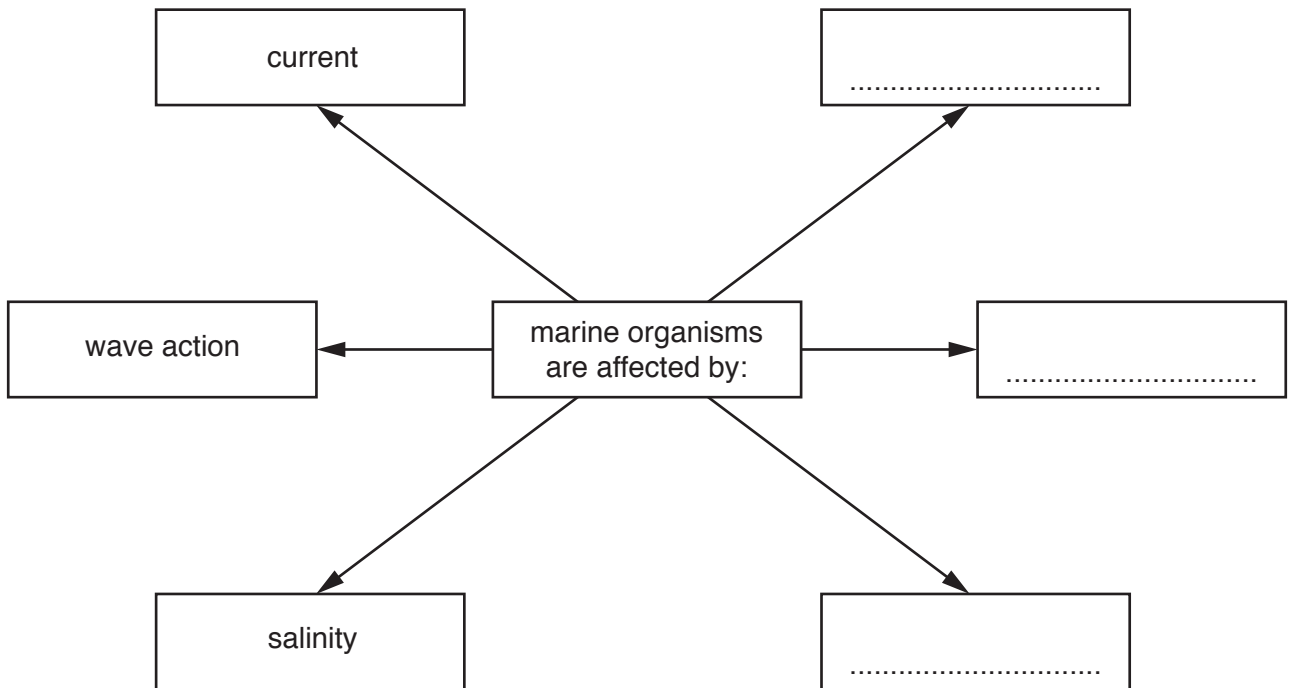
Fig. 9.1

Complete the diagram to show **three** other abiotic factors that affect marine organisms. [3]

[Total: 8]

10 (a) State **two** aims of fisheries management.

1 ....

....

2 ....

....
[2]

(b) State what is meant by the term *endangered species*.

....

....[1]

(c) Explain the meaning of the term *conservation*.

....

....

....

....[2]

(d) Read this information about smuggling turtles and tortoises.

Indonesian Customs officials at Jakarta International Airport discovered 8000 pig-nosed turtles hidden in suitcases.

Thai Customs officials discovered 432 protected tortoises and 52 black pond turtles in unclaimed luggage worth about $110 000.

The next month they found a suitcase containing 62 radiated tortoises.

Thai Customs officials also saved 54 ploughshare tortoises found in the suitcases of two people entering Thailand.

(i) Calculate the total number of animals found.

....
[1]

(ii) In some parts of the world, scientists have begun to engrave the shells of rare species. Fig. 10.1 shows a tortoise with an engraved shell.
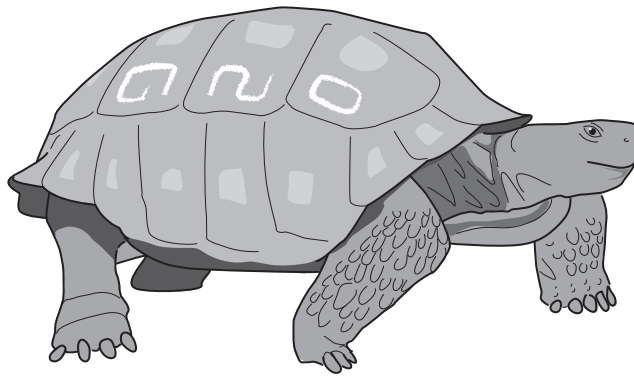

Fig. 10.1

Suggest **two** reasons for engraving the shell.

1 ....

....

2 ....

....

[2]

[Total: 8]

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20

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