Cambridge International Examinations
Cambridge Ordinary Level

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

MARINE SCIENCE **5180/02**

Paper 2 **October/November 2016**

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.

Section A
Answer **both** questions in this section.
Write your answers in the spaces provided on the Question Paper.

Section B
Answer **both** questions in this section.
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 **10** printed pages and **2** blank pages.

International Examinations

[Turn over

Section A

Answer **both** questions in this section.

Write your answers in the spaces provided.

1 Table 1.1 shows the catch of tuna, in tonnes, in the Indian Ocean by different fishing methods every five years from 1985 to 2010.

Table 1.1

fishing method	catch/tonnes					
	1985	**1990**	**1995**	**2000**	**2005**	**2010**
bait boat	46 428	74 360	94 802	119 899	148 266	130 630
gill net	74 446	142 107	174 016	259 296	416 289	376 672
pole and line	25 809	48 394	71 847	85 320	100 674	99 417
long line	102 734	136 701	226 315	253 895	248 958	198 934
purse seine	87 123	241 754	352 309	403 635	490 988	431 312
Total	336 540	643 316	919 289	1 122 045	1 405 175	

(a) Complete Table 1.1 by calculating the total catch for the year 2010. [1]

(b) Use the information in Table 1.1 to find each of the following.

  (i) The year with the highest catch of tuna by pole and line fishing.

  .... [1]

 (ii) The catch of tuna using long line fishing in 1995.

  .... [2]

 (iii) The overall increase in the catch of tuna using purse seine fishing, from 1985 to 2010.

  Show your working.

  answer = ... [2]

5180/02/O/N/16

(iv) The catch by pole and line fishing expressed as a percentage of the total catch for 1995.

Show your working.

answer = ...% [2]

(c) Describe the trend in the total catch from 1985 to 2010.

....

.... [1]

(d) Suggest **two** disadvantages of purse seine fishing.

1 ....

....

2 ....

.... [2]

(e) Tuna catches have increased as a result of the use of artificial Fish Aggregating Devices (FADs).

Suggest why the use of FADs may have harmful effects on the marine environment.

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.... [4]

[Total: 15]

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2 (a) In an investigation, the salinity of water in five samples from the surface of an estuary was measured.

The results are shown in Table 2.1.

Table 2.1

sample	salinity/parts per thousand
1	16.2
2	18.5
3	14.3
4	15.6
5	17.4

Calculate the mean salinity of these five samples.

Show your working.

mean salinity = ... [2]

(b) The salinity of water from different depths in the estuary was also measured. The results are shown in Table 2.2.

Table 2.2

depth/m	salinity/parts per thousand
0	18
2	30
4	31
6	32
10	33
20	34

(i) Plot a line graph of the data in Table 2.2. Join the points on your graph with ruled, straight lines.
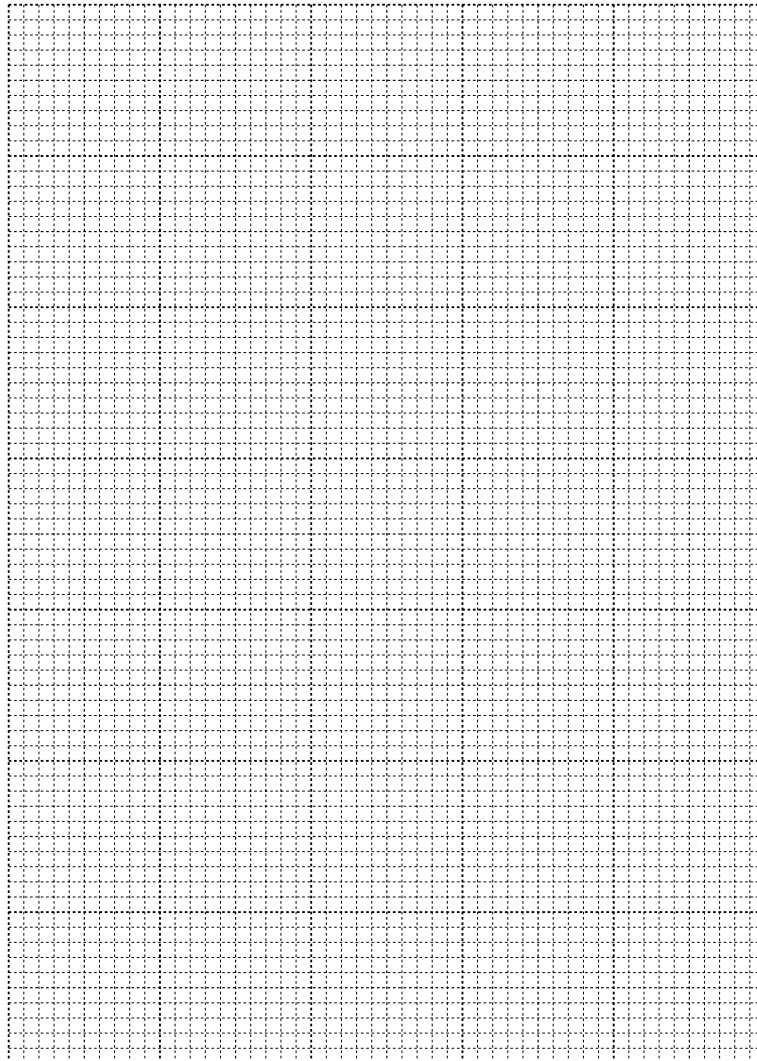
[4]

   (ii) Use your graph to find each of the following.

   The salinity at a depth of 11 m. …………………………………………..

   The depth where the salinity is 24 parts per thousand. ……………………..

   On your graph, show how you found these values.   [2]

   (iii) Using the information in your graph, describe the relationship between depth and salinity in this estuary.

   ....

   ....

   ....

   .... [2]

   (iv) Suggest an explanation for this relationship.

   ....

   ....

   ....

   .... [2]

(c) Suggest **three** factors that could cause the salinity of water at the surface of an estuary to change.

   1 ....

   2 ....

   3 .... [3]

[Total: 15]

Section B

Answer **both** questions in this section.

Write your answers in the spaces provided.

3   **(a)** Explain what is meant by the term *genetic engineering*.

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.... [2]

(b) With reference to a named example, explain what is meant by the term *polynucleotide*.

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.... [3]

(c) (i) Outline the process by which a growth-promoting gene can be transferred to trout.

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.... [4]

(ii) Discuss the economic and environmental implications of the development of genetically engineered trout.

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.... [6]

[Total: 15]

4 Corals and sea anemones are classified in the group Cnidaria.

(a) Describe the **internal** features and their functions of a coral polyp.

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h**11**

(b) Coral reefs may be damaged by coral mining.

Discuss the environmental impact of coral mining on fisheries.

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.... [5]

[Total: 15]

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12

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