

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

FISHERIES SCIENCE

5151/02

Paper 2

October/November 2006

Additional Materials: Answer Booklet/Paper
Graph Paper

1 hour 30 minutes

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.
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 a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **both** questions in **Section A**. Answer any **two** questions in **Section B**.
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 **4** printed pages.



Section A

Answer **both** questions in this section.

- 1 (a) Fig. 1.1 below gives information about the relative numbers of five different species of aquarium fish exported from the Maldives. The numbers of fish exported are expressed as a percentage of the total number of all aquarium fish that were exported.

Species	Local name	Number of live aquarium fish exported expressed as a percentage of the total
<i>Acanthurus leucosternon</i>	Powder blue	12.1
<i>Pseudanthias evansi</i>	Purple wreckfish	10.8
<i>Dascyllus aruanus</i>	Three-stripe damsel	6.0
<i>Chromis viridis</i>	Green damsel	4.0
<i>Amphiprion nigripes</i>	Maldives clown	3.2

Fig. 1.1

[Data adapted from: *Aquarium fishery of the Maldives*, M. Shiham Adam, Marine Research Section]

- (i) Draw a bar graph of the data in Fig. 1.1. [7]
- (ii) Describe how aquarium fish are collected from a reef. [4]

- (b) Figure 1.2 below shows the total numbers of live tropical fish exported from the Maldives, for the years 1990 to 1994.

Year	Numbers of live tropical fish exported
1990	54,572
1991	112,918
1992	161,918
1993	184,233
1994	312,483

Fig. 1.2

[Data adapted from: *Aquarium fishery of the Maldives*, M. Shiham Adam, Marine Research Section]

- (i) Describe the trend shown by this data. [1]
- (ii) Calculate the increase in the number of live tropical fish exported from 1990 to 1994. [1]
- (iii) In 1989, the number of live tropical fish exported to Sri Lanka was 11,940. By 1994, this had increased to 203,587. Calculate the percentage increase and suggest a reason for this change. [2]
- 2 (a) Giving experimental details, describe how you would test a sample of roshi for the presence of each of the following substances.
- (i) Starch [2]
- (ii) Protein [2]
- (iii) Reducing sugars, such as glucose [3]
- (b) Draw a suitable table to record the results of the experiments you have described in (a). [3]
- (c) Describe how you would carry out a simple chemical test to detect spoilage in a sample of fish muscle. In your answer, include references to any safety precautions you would take. [5]

Section B

Answer any **two** questions from this section.

- 3** Give an account of the structure and life cycle of a shore crab (sandy or rock). [15]
- 4** Describe how each of the following can be used to navigate a dhoni from a harbour to a feeding ground, or Fish Aggregating Device (FAD).
- (a)** Mariner's chart [7]
- (b)** Compass [4]
- (c)** Radar [4]
- 5** Filefish camouflage themselves by gently waving their fins so that they look like seaweed. Write an essay on the ways in which other marine organisms are adapted to help avoid predators. [15]
- 6** Write an essay on tourism and how it affects the fishing industry and the Maldivian economy. [15]

Copyright Acknowledgements:

Fig. 1.1 and 1.2 Data on aquarium fish, taken from *Aquarium Fishery of the Maldives*, by M Shiham Adam. Copyright Marine Research Section.

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