Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

FISHERIES SCIENCE **5151/01**

Paper 1

October/November 2005

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 in the spaces provided on the Question Paper.
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 **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.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

This document consists of **15** printed pages and **1** blank page.

1 **(a)** Fig. 1.1 shows the external features of a shark.
Name the structures that are labelled A–E.

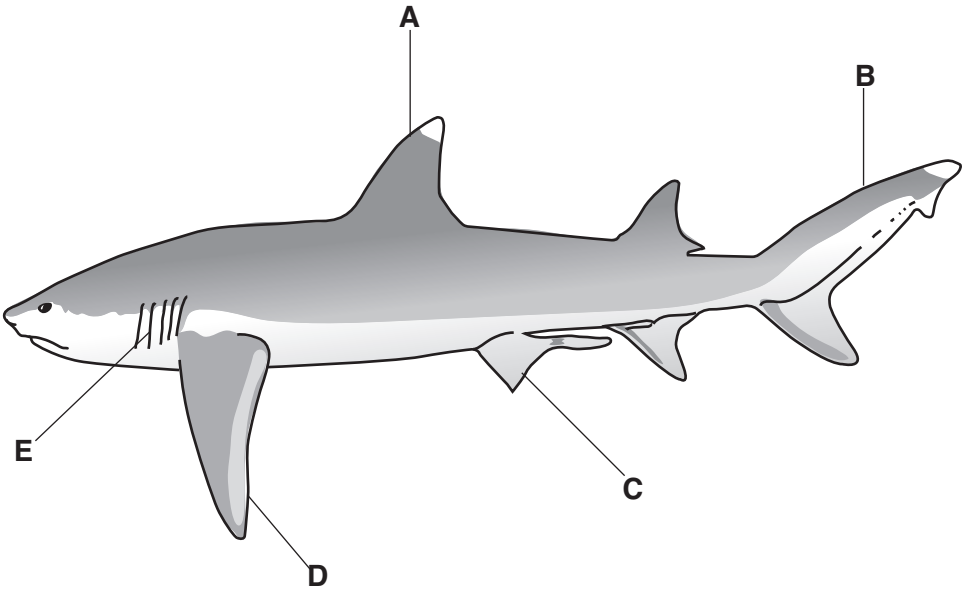


Fig. 1.1

A.....

B.....

C.....

D.....

E.....
[5]

(b) Name the major group of fish which includes sharks and rays.

.....[1]

2 Read through the passage below about our diet. Complete the passage using words from the following list.

vitamins carbohydrate protein growth mineral salts iron lipid iodine complete balanced energy

There are five groups of nutrients found in our food. Lipids and carboyhydrates are our main sources of ..... . Proteins are used by the body to repair tissues and for ..... . To keep us healthy we also need the groups of nutrients called ..... and ..... . If we eat the correct amount of each of these types of nutrient, we are said to have a ..... diet.

Tuna is a good source of ..... and ..... in our diet. The red muscles in tuna contain myoglobin which is a good source of ..... needed to prevent anaemia. [8]

3 The diagrams below show five different knots.
For each type of knot, describe a purpose for which it is used.

(a) Sheet bend

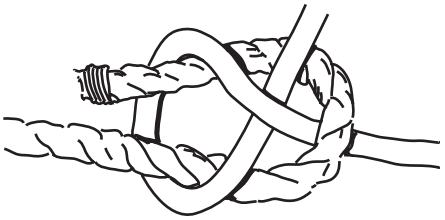


Fig. 3.1

purpose of the knot .....

.....

.....[1]

(b) Figure eight

Fig. 3.2

purpose of the knot .....

.....

.....[1]

(c) Clove hitch

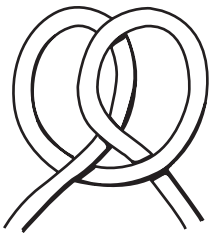


Fig. 3.3

purpose of the knot .....

.....

.....[1]

(d) Bowline

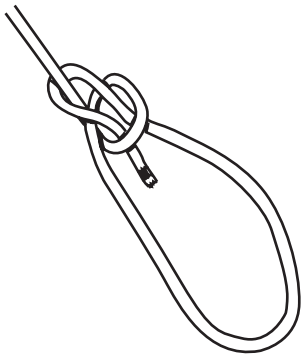


Fig. 3.4

purpose of the knot .....

.....

.....[1]

(e) Fisherman's knot

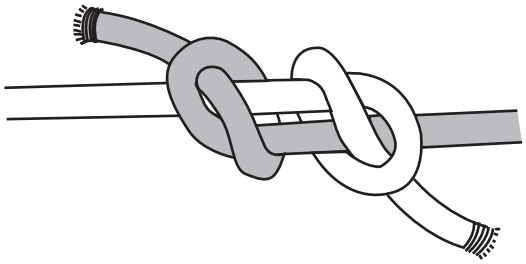


Fig. 3.5

purpose of the knot .....

.....

.....[1]

4 Fig. 4.1 shows two curves that illustrate the carrying capacity of an environment for a population of a species. One curve is the population growth curve. The other curve is the biotic potential curve.

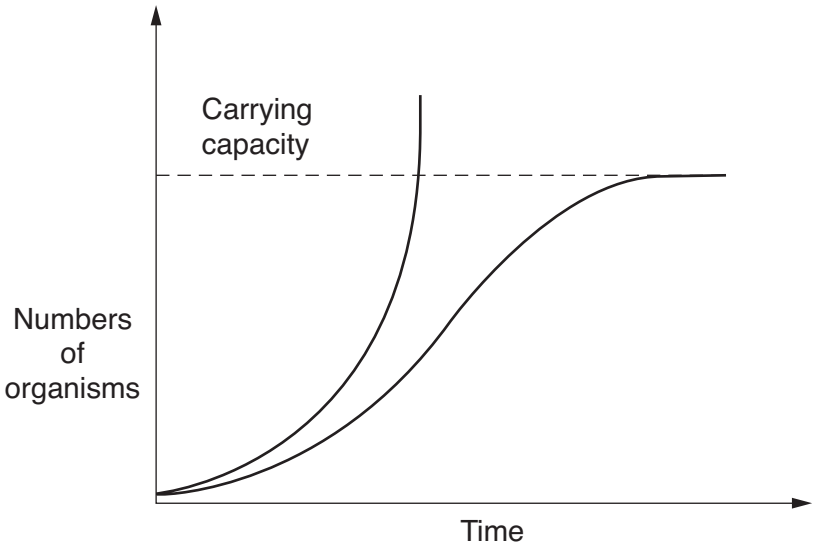


Fig. 4.1

(a) Label the curve in Fig. 4.1 that represents the population growth. [1]

(b) The term biotic potential means the rate of increase in the size of a population living in a perfect environment.

Suggest why a population never reaches its biotic potential.

.....

.....[1]

(c) The carrying capacity of an environment is the result of various environmental factors.

(i) Define the term *carrying capacity*.

.....

.....

.....[2]

(ii) List four factors that may affect the carrying capacity of an environment for a species.

1. .....

2. .....

3. .....

4. .....[4]

(d) Suggest two possible effects on fishing if the carrying capacity of an area of sea is reduced.

1. .....

.....

2. .....

.....[2]

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

(i) *commensalism*

.....

.....

.....[2]

(ii) *mutualism*

.....

.....

.....[2]

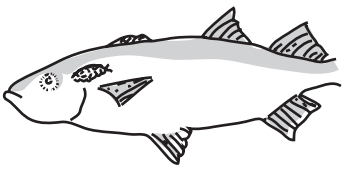
(iii) *parasitism*

.....

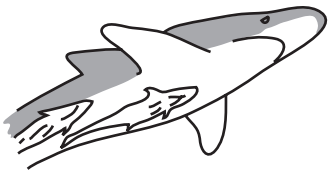
.....

.....[2]

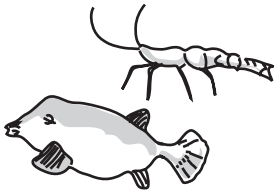
(b) Fig. 5.1 shows examples of relationships between pairs of animal species.



A Mullet and 'fish lice'



B Remora and Shark



C Cleaner Shrimp and Box fish

Fig. 5.1

State which of the relationships, A, B or C is an example of

(i) mutualism .....[1]

(ii) parasitism .....[1]

6 **(a)** Mammals have a double blood circulation, fish have a single circulation.

(i) Explain the difference between a single and a double circulation of the blood.

.....

.....

.....[2]

(ii) Suggest why the heart of a fish has only one atrium and one ventricle.

.....

.....[1]

(b) Give two functions of gills.

1. .....

.....

2. .....

.....[2]

(c) Explain how gills are adapted to carry out these functions.

.....

.....

.....

.....

.....

.....[4]

[Turn over

7 Fig. 7.1 shows the average number of vessels fishing in the Exclusive Economic Zone (EEZ) in the years 2000 and 2001.

Type of vessel	2000	2001
Mechanised Masdhoni	1137	1128
Sail Dhoni	41	66
Mechanised Vadhu Dhoni	58	49
Sail Vadhu Dhoni	72	40
Rowing boats	19	13
Vessels operating in outer EEZ	–	20

Fig. 7.1

(a) How many types of vessel were operating in the inner EEZ?

.....[1]

(b) Suggest a reason for the reduction in the number of sail Vadhu dhonis.

.....[1]

(c) Suggest a reason for the increase in the number of sail dhonis.

.....[1]

(d) Name two types of fishing carried out from rowing boats.

1. .....

2. .....[2]

(e) Name two main types of fish caught by mechanised masdhonis.

1. .....

2. .....[2]

8 A supply vessel leaves Island A, travelling at 8 km per hour. It travels north to Island B which is 24 km from Island A. It takes 1 hour to unload at Island B.

The vessel then travels west to Island C at 8 km per hour. It takes 4 hours to reach Island C and 1 hour to unload.

The vessel leaves Island C travelling at 8 km per hour. The journey from Island C to Island A takes 5 hours.

Fig. 8.1 shows the route taken by the vessel.

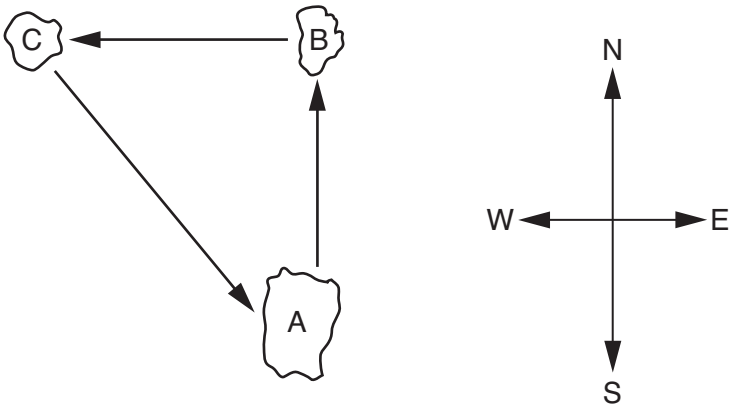


Fig. 8.1

(a) (i) Calculate the distance from Island C to Island A.

.....[1]

(ii) State the direction in which the vessel sails to return to Island A from Island C.

.....[1]

(iii) Calculate the number of hours the vessel is away from Island A.

.....[1]

(iv) Calculate the fraction of the time the vessel is away that it is travelling.

.....[1]

(c) Name **two** instruments that could be used to aid navigation.

1. .....

2. .....[2]

[Turn over

9 Fig. 9.1 shows seven different animals.

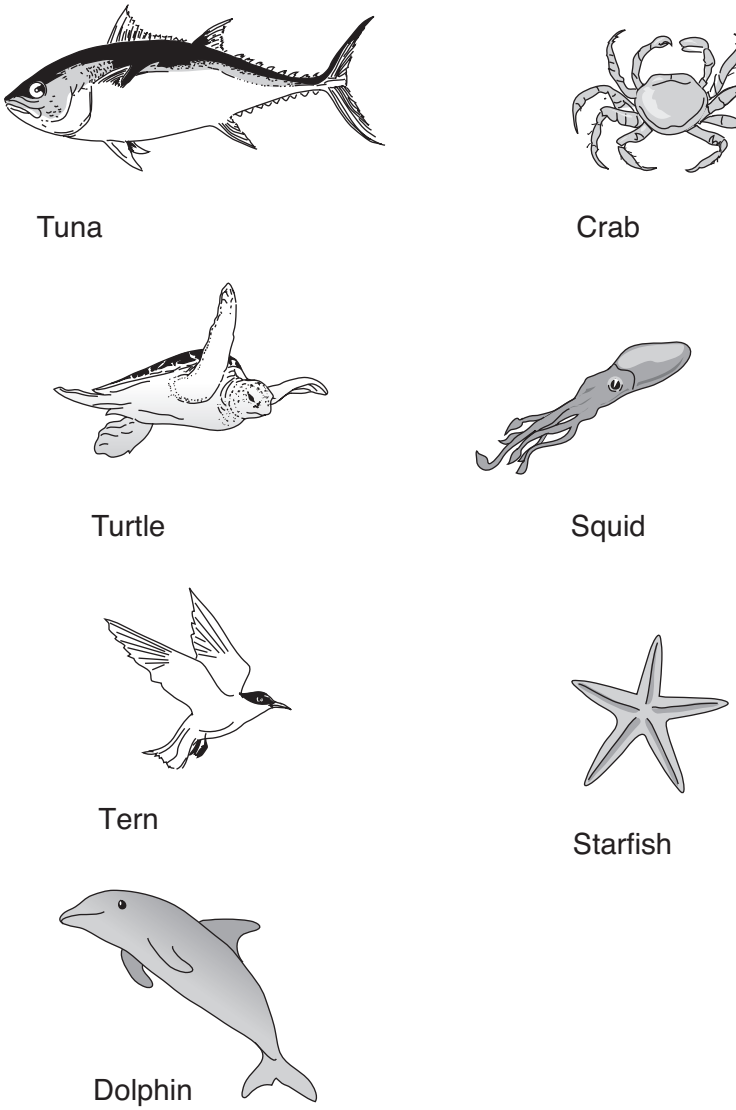


Fig. 9.1

(a) Fig. 9.2, when completed, will show the phylum, class and common name for each of these animals.

Complete the table by filling in the empty boxes.

Phylum	Class	Common name
Chordata		Dolphin
Chordata		Tuna
Chordata	Aves	
		Turtle
Mollusca	Cephalopoda	
	Asteroidea	
Arthropoda		Crab

[9]

Fig. 9.2

(b) Name **three** of these animals that live in the surface waters of the sea.

1. .....

2. .....

3. .....[3]

10 Herring are an important food fish found in the North Atlantic Ocean. Fig. 10.1 shows the numbers of fish of different lengths among 3 year old herring in a sample collected from the North Atlantic on one day. Fig. 10.2 shows the number of fish of different lengths in a similar sample of 4 year old herring. All the herring were caught in nets.

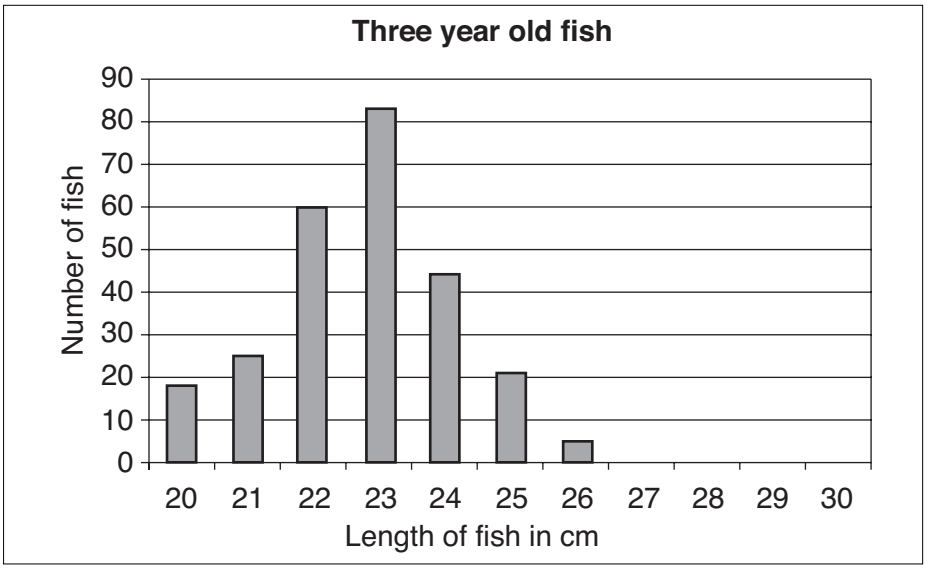


Fig. 10.1

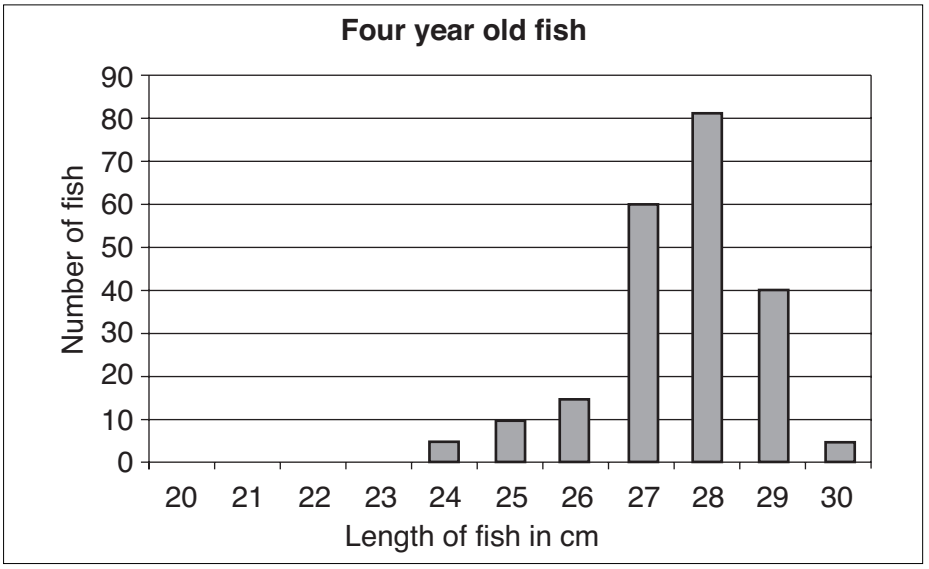


Fig. 10.2

(a) Compare the size distribution among the 3 and 4 year old fish as shown in the two bar charts.

.....

.....

.....

.....

.....[4]

(b) Suggest why there is a range of sizes in both year groups.

.....

.....[1]

(c) Suggest a reason why no fish with a length of less than 20 cm were recorded.

.....

.....[1]

(d) The water in the North Atlantic has seasonal changes in temperature.

Describe the method that would have been used to find the ages of the fish in the sample.

.....

.....

.....

.....[3]

BLANK PAGE