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MARINE SCIENCE

0697/01

Paper 1 Structured

May/June 2021

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Any blank pages are indicated.



Answer **all** questions.

1 Fig. 1.1 shows a food web.

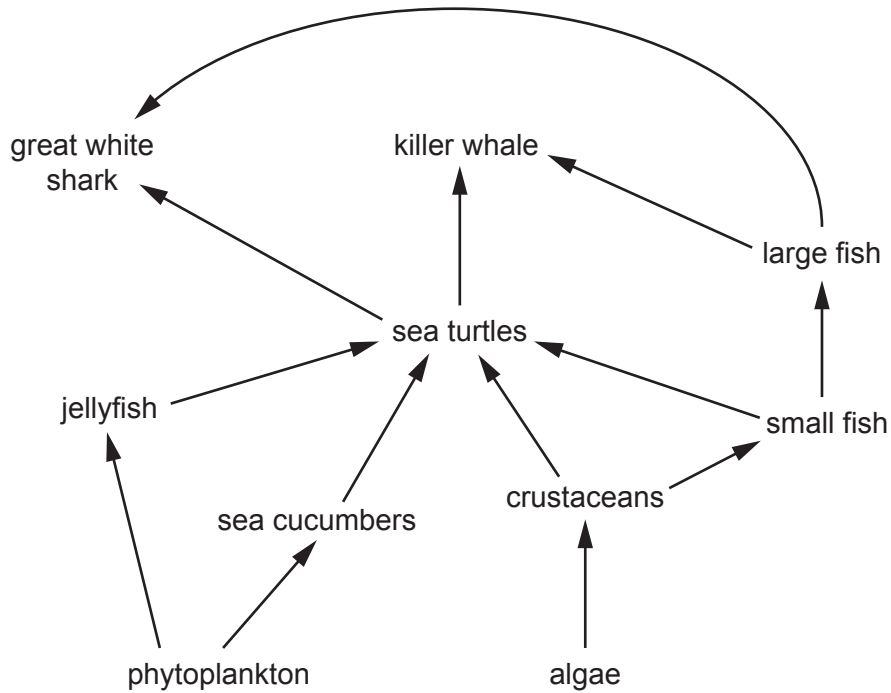


Fig. 1.1

(a) Complete Table 1.1 to name **one** organism from Fig. 1.1 for each description.

Table 1.1

description	name of organism
a herbivore
a primary producer
an organism on the fourth trophic level
a prey of the sea turtles

[4]

(b) Outline the role of primary producers in a food web.

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

(c) Most species of sea turtle are endangered.

Use Fig. 1.1 to suggest **and** explain the impact of a continued decrease in the number of sea turtles on the populations of jellyfish.

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

(d) Suggest **two** conservation measures that can be used to help conserve sea turtles.

1

2 [2]

[Total: 11]

- 2 (a) Fig. 2.1 shows a horned ghost crab, *Ocypode ceratophthalmus*.



Fig. 2.1

Table 2.1 shows the classification for this species.

Complete Table 2.1 to show the correct classification of the horned ghost crab.

Table 2.1

group	name
kingdom	animalia
phylum
.....	crustacea
order	decapoda
genus
species	<i>ceratophthalmus</i>

[3]

- (b) (i) Ghost crabs reproduce through external fertilisation.

Describe the process of external fertilisation.

.....

.....

.....

..... [2]

(ii) After the crab eggs hatch the organisms live as planktonic larvae.

State the meaning of the term planktonic larvae.

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

(iii) Suggest **one** advantage for crabs of having planktonic larvae.

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

(c) Crabs moult many times during their life cycle.

(i) Describe moulting in crabs.

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

(ii) Suggest why crabs moult.

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

[Total: 11]

3 (a) Global warming is considered a worldwide problem. State **two** causes of global warming.

1

.....

2

.....

[2]

(b) (i) Discuss the differences between currents and tides.

.....

.....

.....

.....

.....

.....

[3]

(ii) Suggest the impact global warming may have on tides.

.....

.....

[1]

(c) Define each of these chemical properties of sea water.

(i) pH

.....

.....

[1]

(ii) salinity

.....

.....

.....

.....

[2]

[Total: 9]

4 Coral reefs are environmentally sensitive and can be easily damaged.

(a) Describe the environmental impact of sewage and heavy metals on a coral reef.

(i) sewage

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

(ii) heavy metals

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

(b) On a healthy coral reef scientists noticed a decrease in the number of Nassau grouper fish.

(i) Explain how the catch per unit effort for Nassau grouper fish would be affected on this reef.

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

(ii) Explain how **one** named fisheries practice could be used to increase the number of Nassau grouper fish.

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

[Total: 10]

- 5 A fishing boat travels from its home port, **X**, to a fishing ground, **Y**. After fishing it takes the catch to the processing plant, **Z**, before returning to the home port.

Fig. 5.1 shows the chart for this journey.

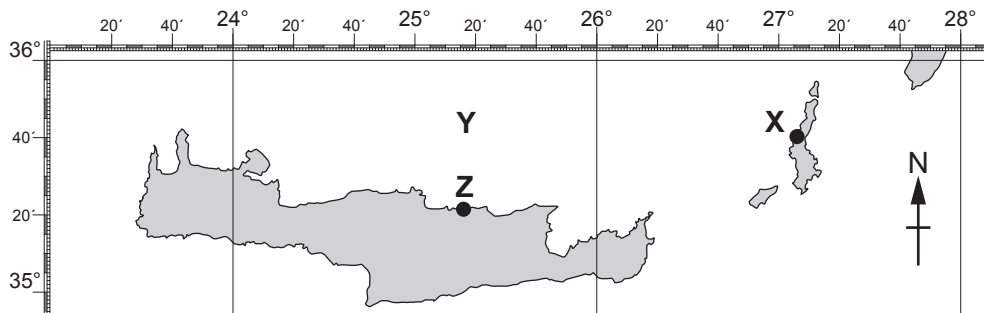


Fig. 5.1

- (a) State the latitude and longitude of the home port, **X**.

latitude

longitude

[2]

- (b) (i) State the name of the instrument used to know the direction of travel of the boat.

..... [1]

- (ii) State the direction the boat travels from the fishing ground, **Y**, to the processing plant, **Z**.

..... [1]

- (iii) Name **one** abiotic factor that may cause the boat to be off course.

..... [1]

- (c) Suggest **two** reasons why the fishermen may use an echo sounder.

1

.....

2

.....

[2]

(d) The fishing boat uses the purse seine method. Fig. 5.2 shows four different fishing methods.

(i) Tick the box below the diagram that shows the purse seine method.

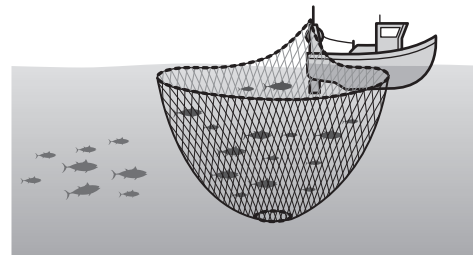
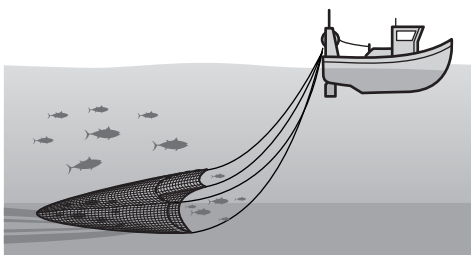
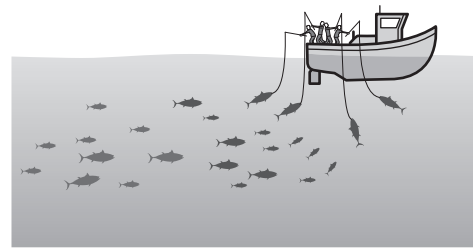
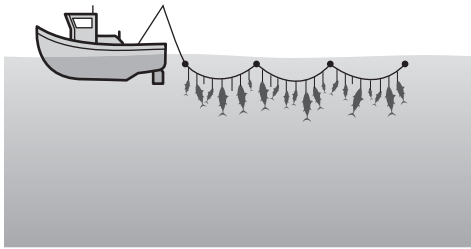


Fig. 5.2

[1]

(ii) State **one** environmental problem of purse seine fishing.

.....

..... [1]

[Total: 9]

6 (a) For each biological molecule, state **one** function in the human body.

(i) protein

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

(ii) lipid (fats or oils)

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

(iii) nucleic acids (DNA or RNA)

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

(b) State **one** social and **one** economic importance of fish as a source of food.

social

.....
.....

economic

.....
.....

[2]

(c) To reduce spoilage of fish it is often processed and preserved.

(i) Describe the process of putrefaction in fish.

.....
.....

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

(ii) Canning is a method of preserving fish.

Describe the canning method.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

7 Fig. 7.1 shows a map of an island that has an active fishing industry. A marine ecotourism hotel has recently been built on the island.

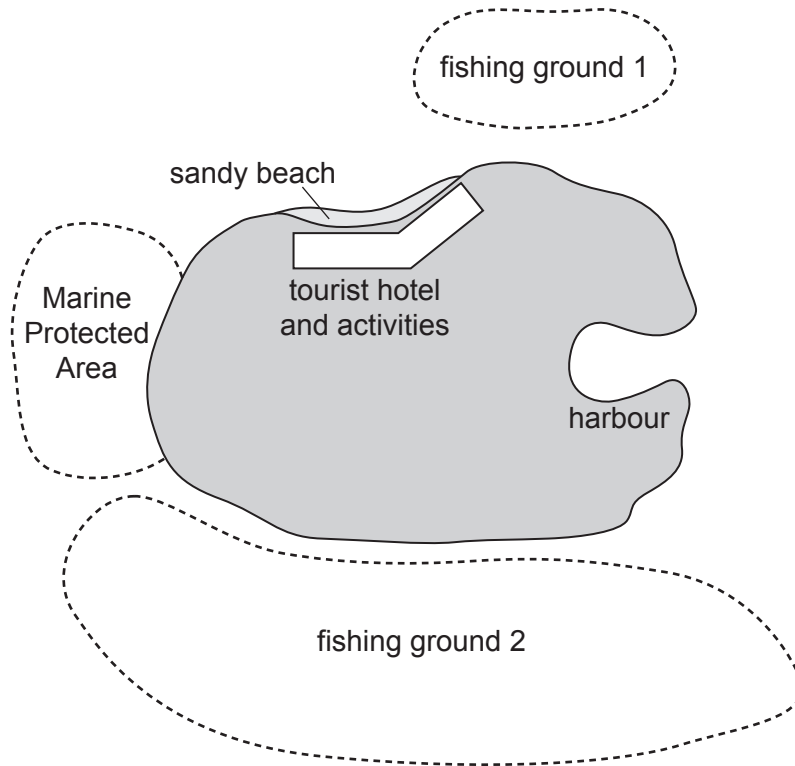


Fig. 7.1

(a) (i) State **two** aims of marine ecotourism.

1

.....

2

.....

[2]

(ii) Using Fig. 7.1, suggest **two** conflicts that could occur between the fishermen and the tourism business.

1

.....

2

.....

[2]

(iii) Suggest **two** benefits the tourism business could have for the fishermen.

1

.....

2

.....

[2]

(b) State how the Marine Protected Area can benefit both the tourism industry and the fishermen.

tourism industry

.....

.....

fishermen

.....

.....

[2]

(c) List **three** features a fisherman would expect to find at a modern harbour.

1

2

3

[3]

[Total: 11]

8 Fig. 8.1 shows a map of the world.

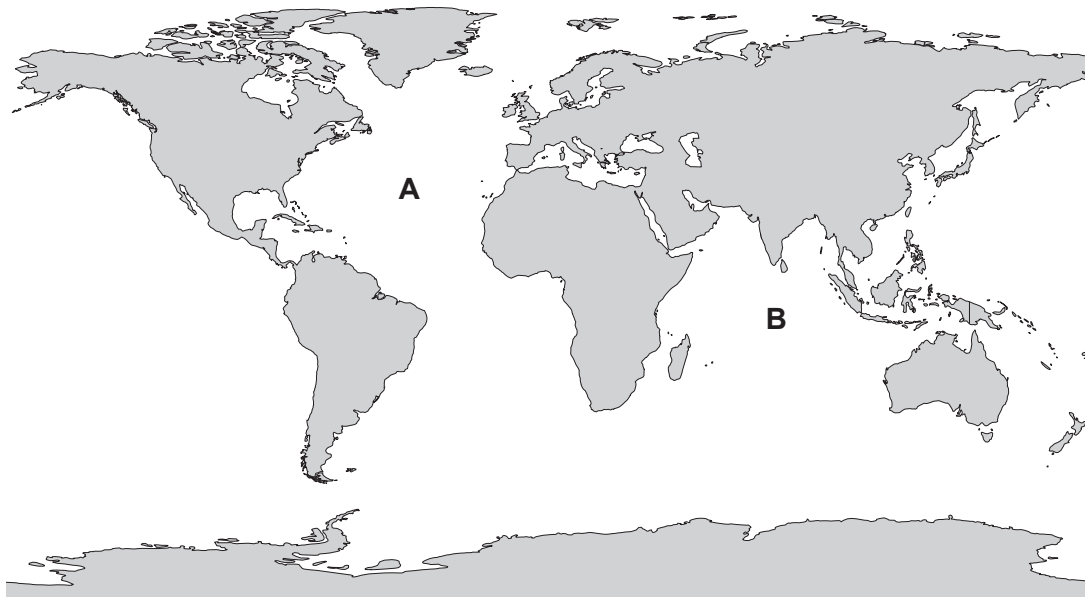


Fig. 8.1

(a) (i) Identify the oceans labelled **A** and **B**.

A

B

[1]

(ii) List the **three** main factors affecting international fisheries resources.

1

2

3

[2]

(b) Table 8.1 shows the number of four species of shark caught as by-catch and released by the longlining fleet in the Maldives.

Table 8.1

year	hammerhead sharks	thresher sharks	mako sharks	whitetip sharks
2014	143	822	875	1525
2015	14	44	72	331
2016	78	374	534	464
2017	34	86	141	86

In the Maldives, there is a complete ban on shark fisheries, but fishing vessels have to record the sharks accidentally caught and released.

(i) Suggest **one** action taken by the fisheries authority to ensure no sharks are landed.

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

(ii) State the year fewest total number of sharks were accidentally caught.

..... [1]

(iii) Between 2014 and 2017 the number of whitetip sharks accidentally caught decreased by nearly 95%.

Suggest **two** possible reasons for this.

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

(c) In many countries consumers want to buy fish that has a low environmental impact.

(i) Explain the meaning of the term consumer.

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

(ii) Suggest how the data in Table 8.1 show an improving environmental impact of this fishery.

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

[Total: 9]

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