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MARINE SCIENCE

0697/01

Paper 1 Theory and Data Handling

For examination from 2024

SPECIMEN PAPER

1 hour 45 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 **18** pages. Any blank pages are indicated.

1 Fig. 1.1 shows migration routes of humpback whales.

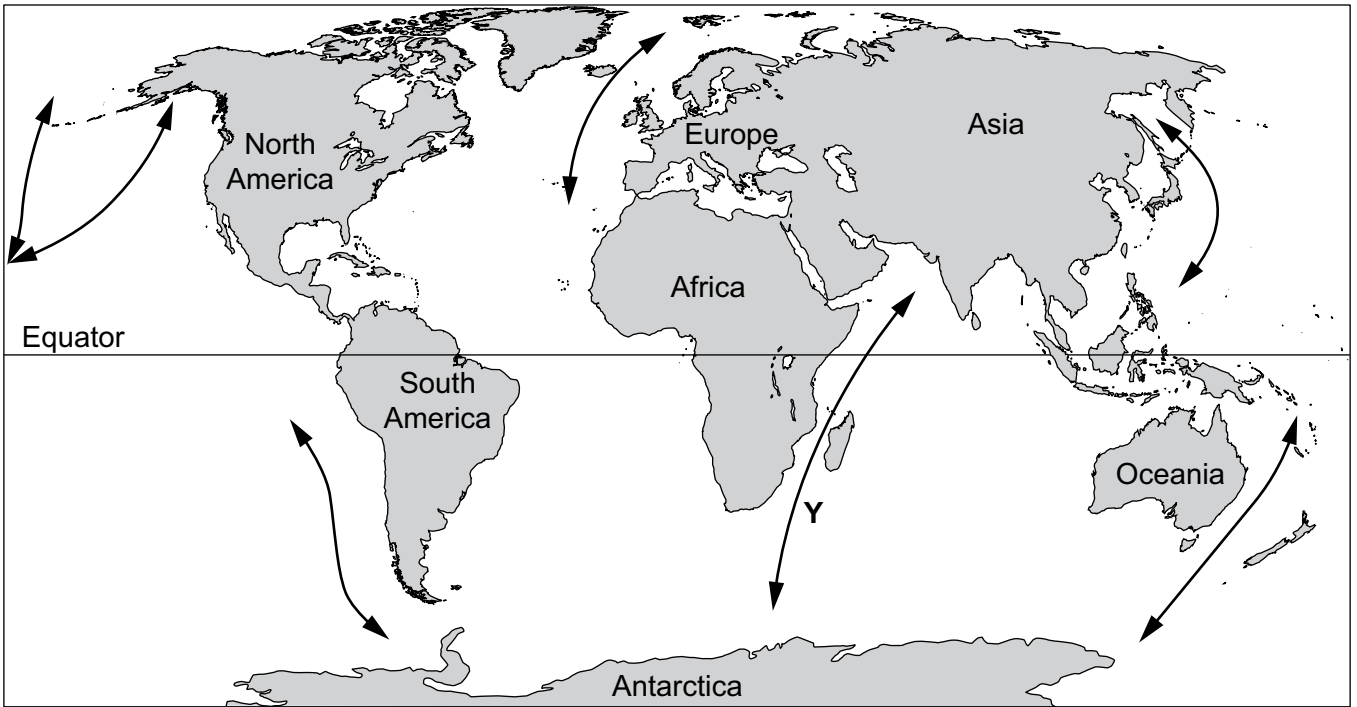


Fig. 1.1

(a) (i) Migration route Y represents the movement of one whale. State the names of the **two** oceans between which this whale migrates.

- 1
- 2 [2]

(ii) State **two** reasons why whales migrate.

- 1
-
- 2
- [2]

(iii) State **two** methods the whale may use to find its way when migrating.

- 1
- 2 [2]

(b) A whale dives through the pelagic zone to a depth of 2000 m.

(i) State the names of the **three** zones the whale dives through.

- 1
- 2
- 3 [3]

(ii) Describe the changes in temperature and light as the whale dives to 2000 m.

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..... [4]

[Total: 13]

2 (a) Fig. 2.1 shows a cell from a seagrass plant.

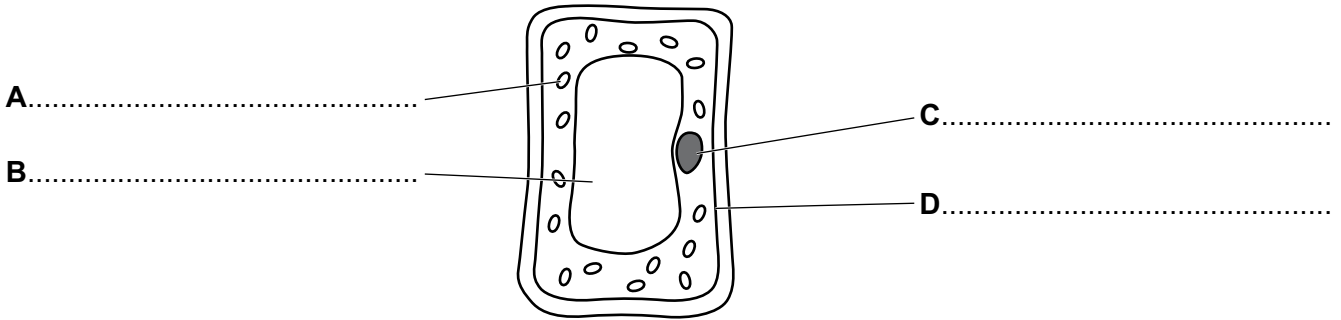


Fig. 2.1

(i) Identify the structures labelled **A**, **B**, **C** and **D** on Fig. 2.1.
Write your answers on Fig. 2.1. [3]

(ii) Aerobic respiration occurs in cells.

State the **word** equation for aerobic respiration.

.....
 [2]

(b) Describe **three** ways an animal cell differs from the plant cell shown in Fig. 2.1.

1

 2

 3
 [3]

(c) Manatees are sirenian mammals that feed on seagrass.

(i) State **two** features of sirenians that identify them as mammals.

1

2

[2]

(ii) Manatees obtain essential elements from eating seagrass.

Name **two** of these essential elements. For each element state its biological role in an animal such as a manatee.

essential element

biological role

essential element

biological role

[4]

[Total: 14]

- 3 Fig. 3.1 shows part of a food web. The numbers show the total energy for organisms at each trophic level in arbitrary units, a.u.

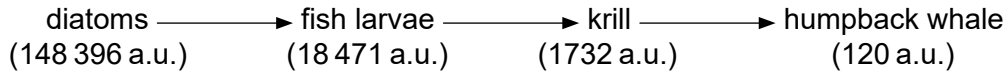


Fig. 3.1

- (a) Squid eat krill. Squid are eaten by humpback whales.

Add this information to Fig. 3.1. [1]

- (b) (i) The numbers in Fig. 3.1 show the total energy in each trophic level.

Calculate the difference between the energy held in trophic level 2 and trophic level 3.

..... a.u. [1]

- (ii) State **two** reasons for the loss of energy between trophic levels.

1

2

[2]

- (c) Suggest why detritivores are **not** usually included in food webs.

.....

[2]

[Total: 6]

4 (a) Leatherback turtles are an endangered species.

State what is meant by an endangered species.

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

(b) Outline the life cycle of the leatherback turtle.

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.....
.....
..... [5]

(c) Leatherback turtles are often disturbed at their beach nesting sites.

The pie chart in Fig. 4.1 shows the number and type of disturbances at a leatherback nesting site on one night.

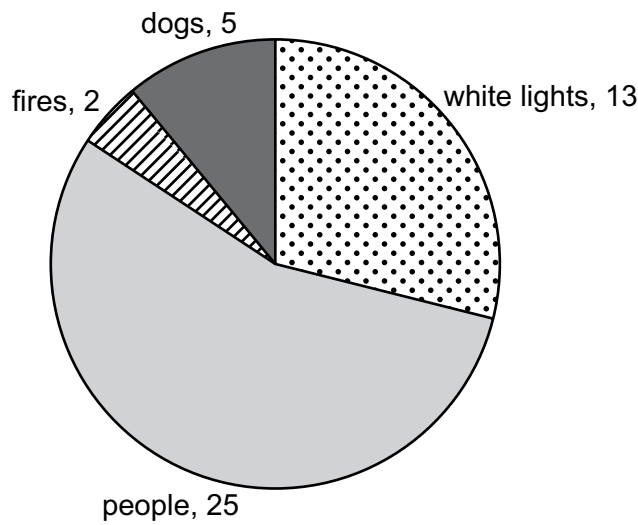


Fig. 4.1

(i) Calculate the disturbances due to white lights as a percentage of total disturbances. Show your working.

..... [2]

(ii) Suggest why white lights on the beach at night disturbs turtle breeding.

..... [1]

(iii) Scientists estimate that fewer than 0.05% of turtle eggs laid reach adult maturity.

Suggest **three** reasons, caused by humans, for turtle deaths in the oceans.

1 [3]
 2
 3

[Total: 12]

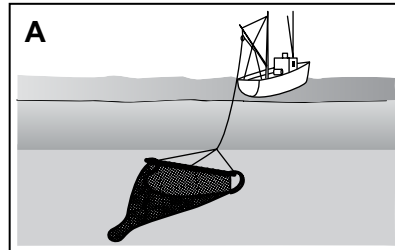
5 (a) Fig. 5.1 shows some names and diagrams of fishing methods.

(i) Draw **one** line from the name of each fishing method to the diagram of that method. You should draw **four** lines.

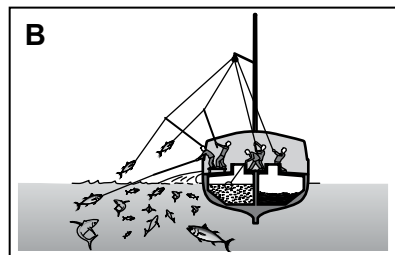
fishing method

diagram of fishing method

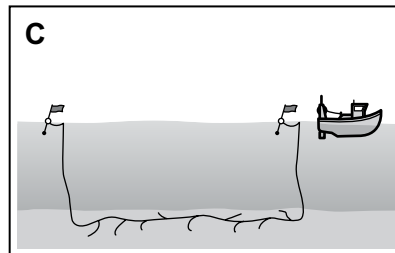
pole and line



seine nets (purse seine)



cast netting



longlining

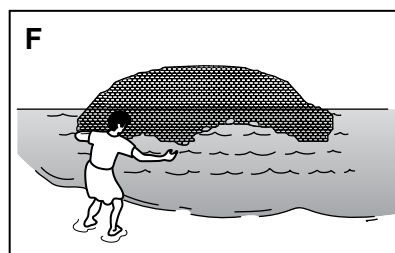
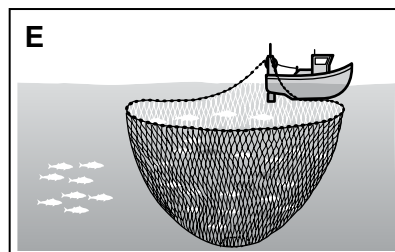
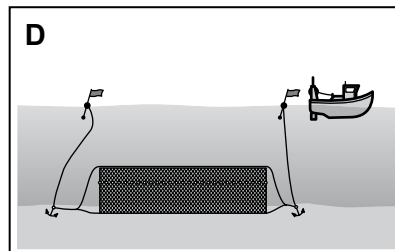


Fig. 5.1

[3]

(ii) Explain a harmful environmental impact of method **A**.

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

(iii) State the letters of the **two** methods that have the least harmful environmental impact.

..... and [1]

(b) Using quotas is a method of maintaining sustainable harvesting of fish.

(i) Explain the use of quotas in maintaining harvesting at sustainable catch levels.

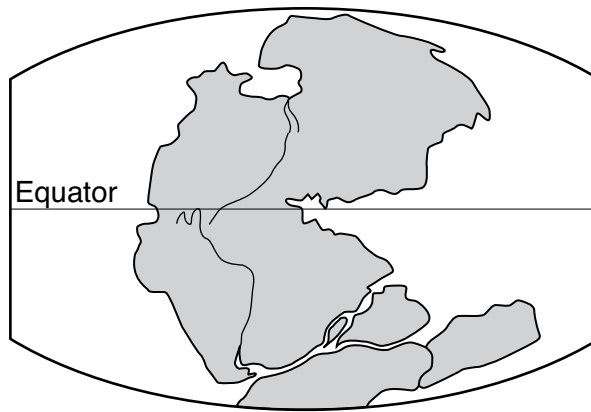
.....
.....
.....
..... [2]

(ii) Describe the effects of using quotas on fish stock levels.

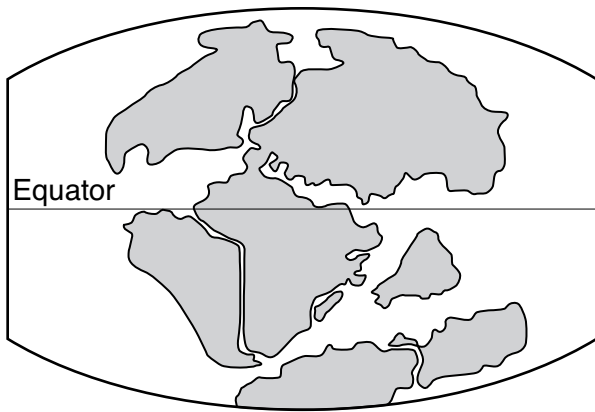
.....
.....
.....
..... [2]

[Total: 10]

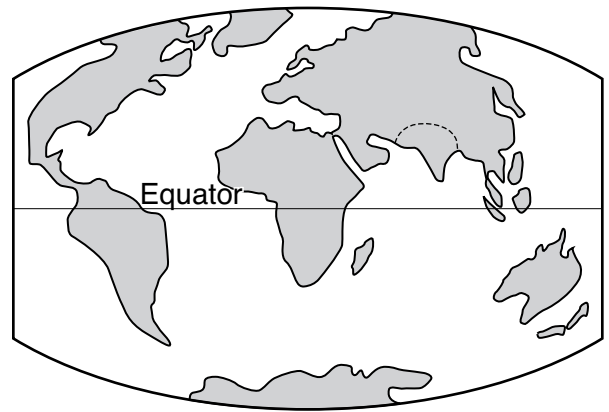
- 6 (a) Fig. 6.1 shows some of the changes in the positions of the Earth's land masses over the last 250 million years.



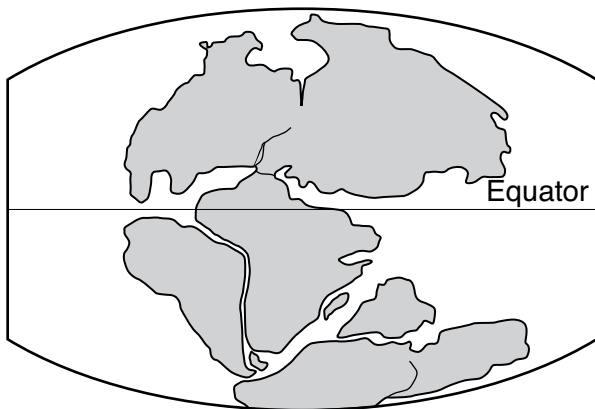
A



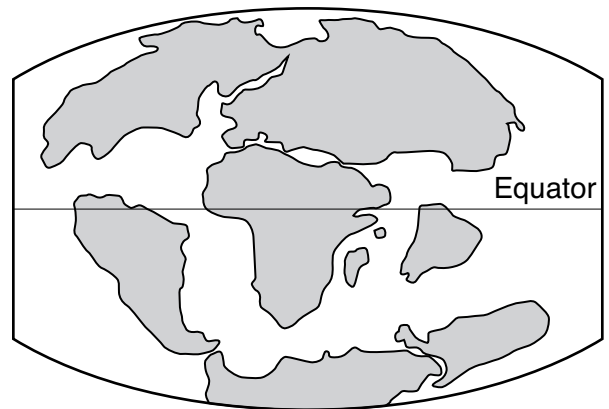
B



C



D



E

Fig. 6.1

Complete Table 6.1 to show the order the changes in the positions of the Earth's land masses occurred. One has been completed for you.

Table 6.1

order	diagram
1	
2	
3	
4	
5	C

[2]

(b) Navigators use maps and charts to safely travel the world's oceans.

(i) List **three** other navigational aids.

1

2

3

[2]

(ii) Charts and maps are divided up by two sets of lines, which are used to locate the position of a place.

Name each set of lines and describe how they locate position.

1

.....

2

.....

[3]

[Total: 7]

7 Fig. 7.1 shows a diagram of the water cycle.

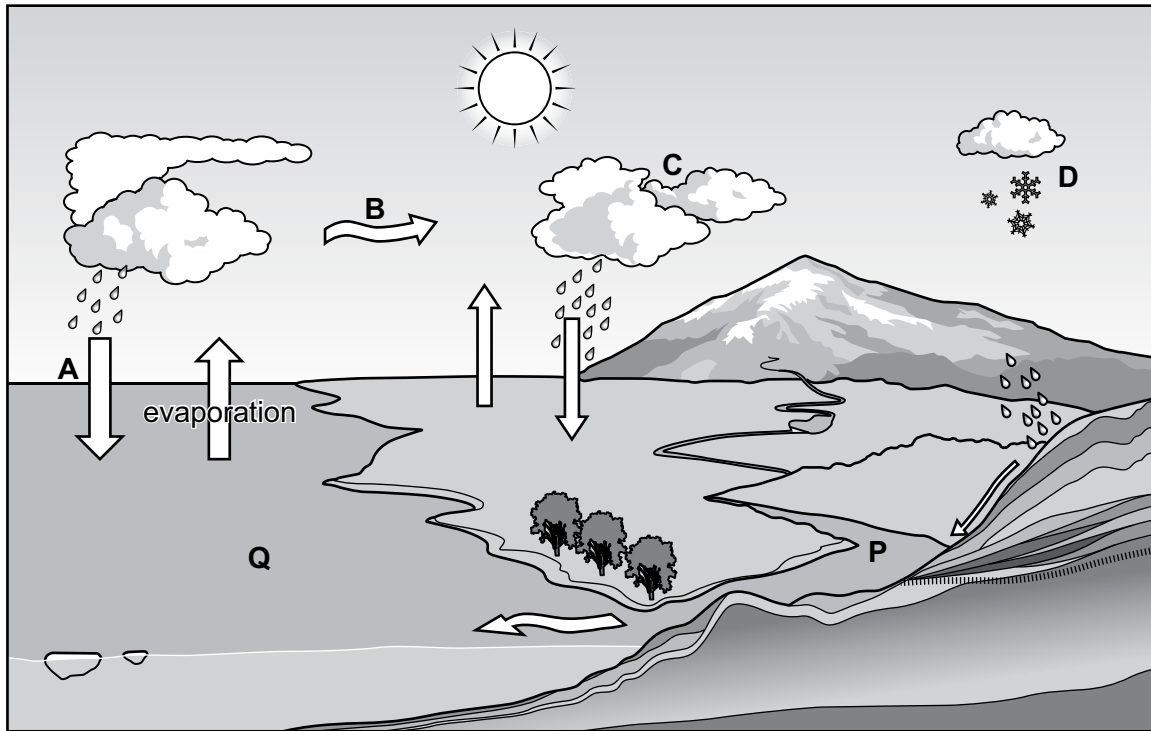


Fig. 7.1

(a) (i) State the letter in Fig. 7.1 which shows where condensation occurs.

letter

[1]

(ii) Suggest **three** ways the water at P is different from the water at Q.

- 1
- 2
- 3

[3]

(b) (i) Explain why the rate of evaporation from a polar ocean differs from the rate of evaporation from a tropical ocean.

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

(ii) Explain how **and** why the density of water in polar oceans differs from the density of water in tropical oceans.

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

[Total: 9]

8 (a) Fig. 8.1 shows some of the abiotic factors that affect marine organisms on a sandy shore.

Complete Fig. 8.1 with **three** other **abiotic** factors that affect marine organisms on a sandy shore. [3]

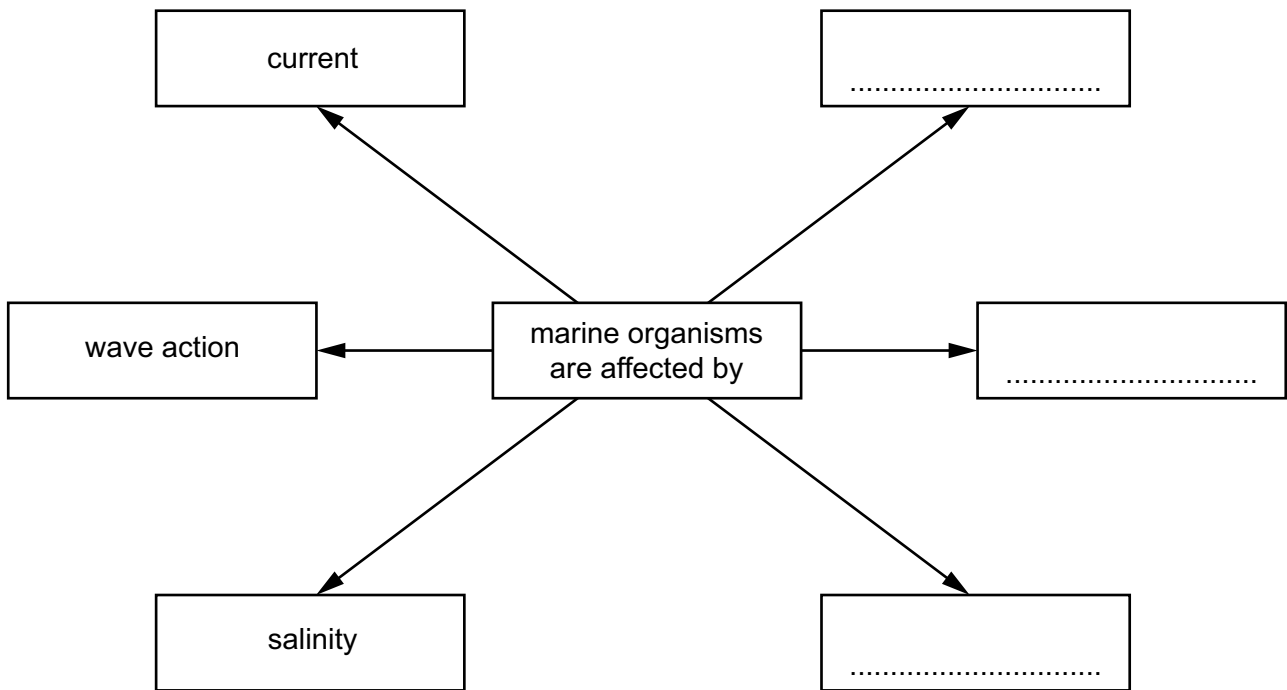


Fig. 8.1

(b) Fig. 8.2 shows organisms on a rocky shore.



Fig. 8.2

Fucus sp. and kelp are macroalgae (seaweed).

Describe how abiotic and biotic factors affect the distribution of macroalgae on a rocky shore.

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[6]

[Total: 9]

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Copyright Acknowledgements:

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- Question 8 © Ref: C024/5332; ASHLEY COOPER / SCIENCE PHOTO LIBRARY; *Seahouses on the Northumberland coast*; www.sciencephoto.com

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