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MARINE SCIENCE

0697/12

Paper 1 Theory and Data Handling

February/March 2026

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. Do **not** use correction fluid or tape.
- 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.

1 The water cycle is an important process on Earth.

(a) (i) Draw **one** line from each process to its correct description.

process	description
evaporation	Water vapour cools and turns into a liquid.
run-off	Water runs over soil into rivers.
condensation	Water turns from a liquid to a gas.
precipitation	Solid water turns into a gas.
	Water falls as rain or snow.

[2]

(ii) Describe the energy change that happens as water freezes.

.....
 [1]

(b) Figure 1.1 shows a river flowing through an estuary into the ocean.

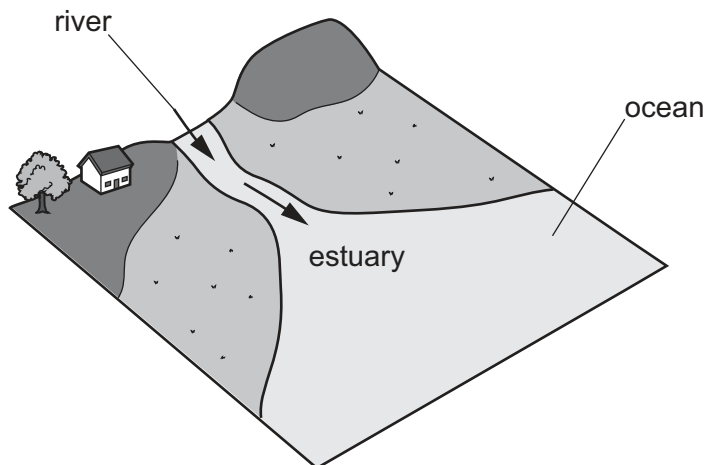


Figure 1.1



- (i) Describe how the salinity of the water changes as water flows from the river to the ocean.

.....
 [1]

- (ii) Explain what happens to the salinity in the estuary during a tidal cycle.

.....

 [3]

- (iii) The river water is warmer than the ocean water.

Explain the effect this has on the solubility of gases as the river water flows into the ocean water.

.....

 [3]

- (iv) Figure 1.2 shows a profile through the estuary.

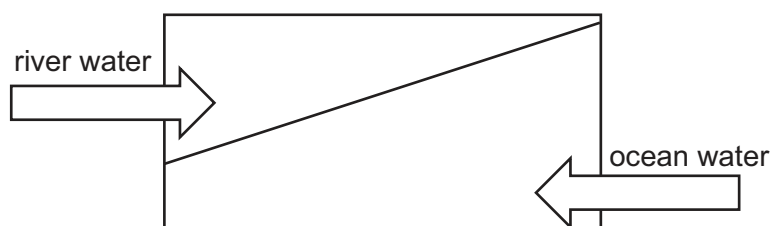


Figure 1.2

Explain why the warmer river water floats above the ocean water in the estuary.

.....

 [2]

[Total: 12]

2 Figure 2.1 shows a cross-section of an ocean.

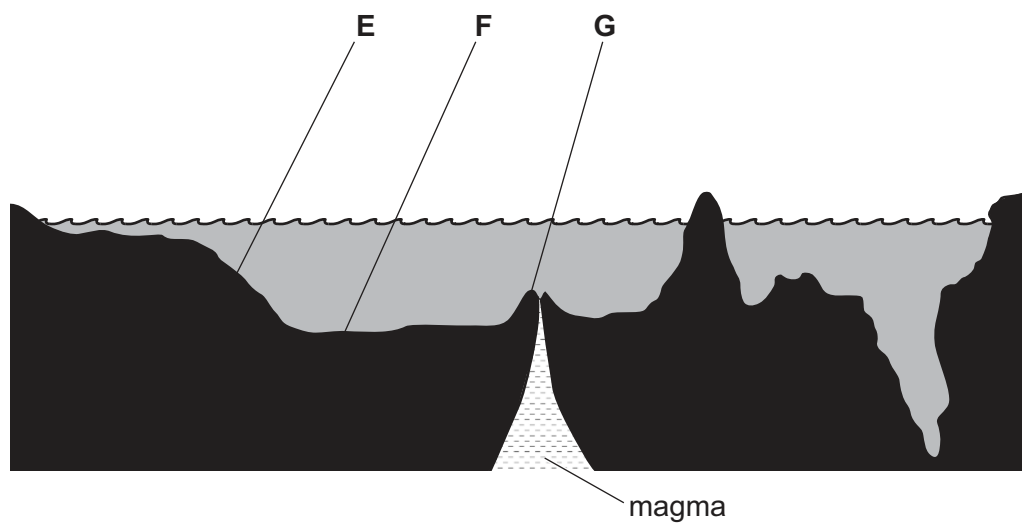


Figure 2.1

(a) State the name of the areas labelled E, F and G.

E

F

G

[3]

(b) Figure 2.2 shows the location of the Mariana Trench.

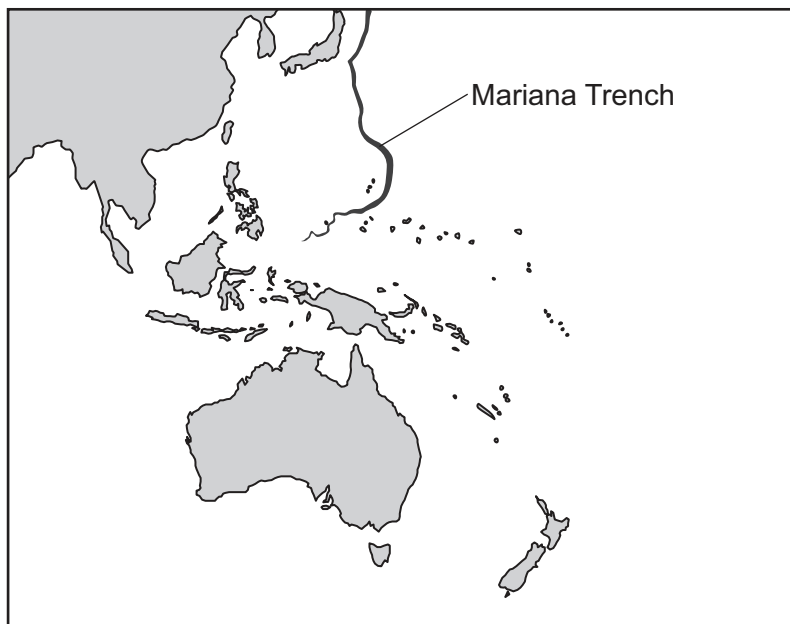


Figure 2.2

(i) State the depth at the bottom of the Mariana Trench.

..... [1]

(ii) Explain why **no** living phytoplankton are found in the Mariana Trench.

.....

 [2]

(iii) Some marine species are adapted to live at the bottom of the Mariana Trench.

State **two** adaptations of deep-sea species.

1
 2 [2]

[Total: 8]

3 A conservation organisation is using aquaculture of the Olympia oyster to increase its population.

(a) (i) Oysters are molluscs.

State **one** feature typical of all molluscs.

.....
 [1]

(ii) Suggest **two** reasons why the population of the Olympia oyster has decreased.

1

 2
 [2]

(b) Scientists used a method to reintroduce the Olympia oyster into a conservation area.

- They released oyster larvae into a tank containing empty shells from other oyster species.
- They allowed the larvae to settle on the shells.
- They determined the mean number of larvae per shell.
- They collected the shells into bags.
- They transported the bags to the conservation area to release the shells into the sea.

(i) The mean number of larvae per shell was 7.2.
 Each bag contained 250 shells.

Calculate the minimum number of whole bags needed to release at least 50 000 oysters into the conservation area.

minimum number of whole bags = ... [2]

(ii) After one year, 15% of the oysters had died.

Calculate the total number of oysters remaining after one year.

oysters remaining after one year = ... [1]



- (c) The conservation organisation makes sure their methods do not cause eutrophication.

Outline the process of eutrophication.

.....

.....

.....

.....

.....

..... [4]

- (d) The conservation organisation shares the information on breeding and growing this species with commercial oyster growers.

Suggest why providing this information to commercial oyster growers is an advantage to the conservation of the Olympia oyster.

.....

.....

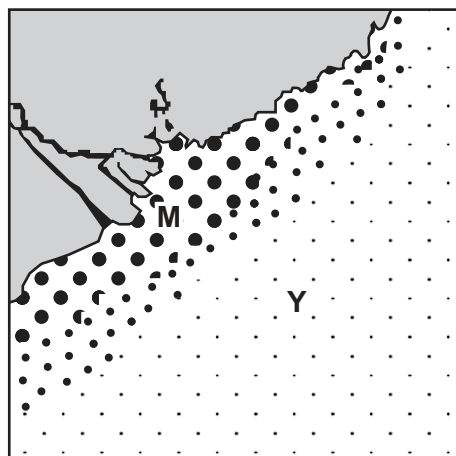
.....

..... [2]

[Total: 12]



- 4 Figure 4.1 shows a map of primary productivity in a coastal region.



primary productivity



low medium high

Figure 4.1

- (a) (i) Explain why area **M** has higher primary productivity than area **Y**.

.....

.....

.....

..... [2]

- (ii) Suggest how high primary productivity at **M** will benefit fisheries.

.....

.....

.....

..... [2]

- (iii) Suggest **one** disadvantage of harvesting fish from area **M**.

.....

..... [1]





(b) When travelling in area **M**, fishing boats may use a variety of navigational aids.

State which navigational aid is useful for each situation.

locating a large group of fish

.....

checking for other vessels in fog

.....

locating the fishing boat's position

.....

plotting a course to travel

.....

[4]

[Total: 9]



- 5 Banded archerfish are found in mangrove forests. Figure 5.1 shows a banded archerfish.



Figure 5.1

- (a) State **one** adaptation visible in the photograph.

Explain how the adaptation benefits the fish.

.....

.....

.....

..... [2]

- (b) Suggest **two** biotic factors that affect the population growth of banded archerfish.

1

2 [2]

- (c) The mangrove forest ecosystem is important to humans.

- (i) Suggest **three** ways mangrove forests benefit people.

1

.....

2

.....

3

..... [3]





(ii) Explain **two** impacts humans have on mangrove forests.

1

.....

2

.....

[2]

[Total: 9]



- 6 Figure 6.1 shows a leatherback turtle with a tracking device attached. The tracking device is used to find the location of the turtle.

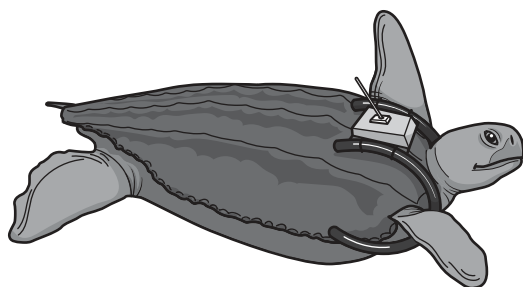


Figure 6.1

- (a) (i) The turtle in Figure 6.1 has been seen arriving at the same shore every four years. Each time the turtle arrives, it is seen near the shore for around 40 days.

Suggest why.

.....

.....

.....

.....

.....

..... [3]

- (ii) Explain how continued climate change may affect the ratio of male turtles to female turtles in the future.

.....

..... [1]

- (iii) Leatherback turtles breed through sexual reproduction.

Explain how sexual reproduction is different from asexual reproduction.

.....

.....

.....

..... [2]



(b) Leatherback turtles can dive to depths of 1000 m and stay there for over an hour. Other species of turtle only dive to depths of 175 m.

(i) Leatherback turtles have a much higher concentration of iron in their blood than other turtle species.

Suggest why leatherback turtles can dive to greater depths and for longer time periods than other species of turtles.

.....

.....

.....

..... [2]

(ii) Describe how light penetration changes with increasing depth.

.....

..... [1]

(iii) Explain how pressure changes with increasing depth.

.....

..... [1]

(iv) Explain how the concentration of dissolved oxygen changes with increasing depth.

.....

.....

..... [2]



(c) Figure 6.2 shows a cell from a turtle.

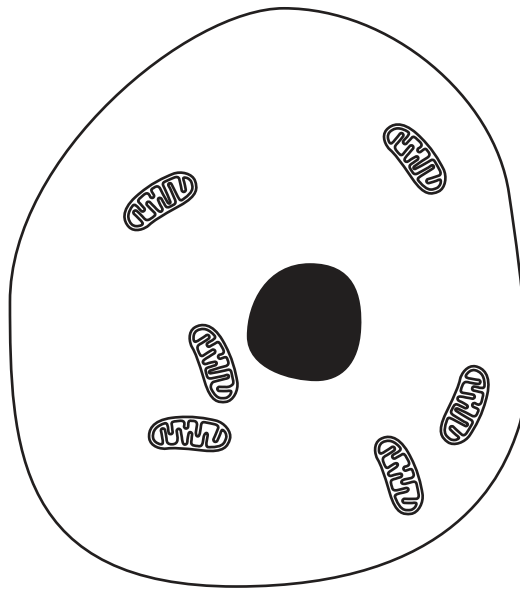


Figure 6.2

- (i) On the diagram, label the nucleus and cell membrane. [2]
- (ii) Describe the function of the cell membrane.

.....

..... [1]

[Total: 15]



- 7 Figure 7.1 shows a sandy shore, and Figure 7.2 shows a rocky shore.



Figure 7.1



Figure 7.2

- (a) (i) Describe how abiotic conditions are different between the two types of shore shown in Figure 7.1 and Figure 7.2.

.....

.....

.....

..... [2]

- (ii) Explain which shore lugworms are adapted to live on.

.....

.....

.....

..... [2]

- (b) Upwellings may affect the productivity of oceans near these two types of shore.

Describe how winds cause upwellings to occur.

.....

.....

.....

.....

.....

..... [3]

[Total: 7]





8 Plastic pollution impacts the environment.

(a) Describe **two** impacts of plastics on marine ecosystems.

.....

[2]

(b) Discuss strategies for reducing plastic pollution.

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 8]

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