

GCSE Biology B (Twenty First Century Science)
J257/04 Depth in biology (Higher Tier)

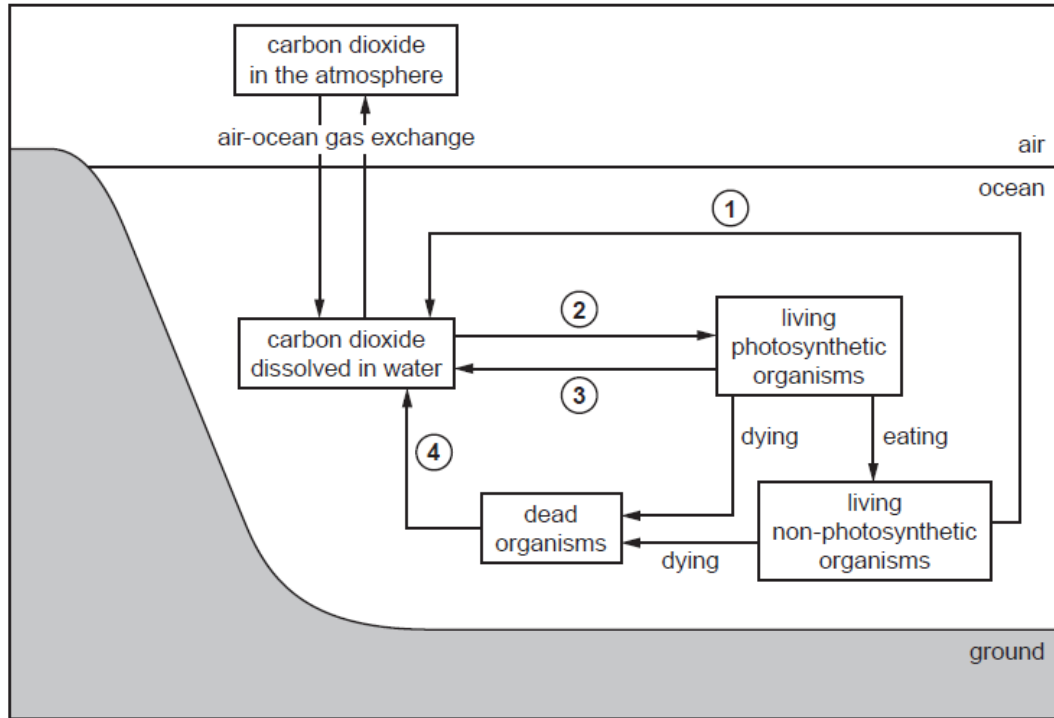
Question Set 3

1

Oceans cover two thirds of the Earth's surface and absorb one third of the carbon dioxide created by human activities.

Oceans play a very important part in cycling carbon.

(a) (i) The diagram shows the parts of the carbon cycle that take place in the ocean.



Write down the names of the processes that have been labelled 1, 2, 3 and 4 in the diagram.

[3]

(ii) Explain the roles of microorganisms in the ocean carbon cycle shown in the diagram.

[3]

(iii) The processes shown in the diagram cycle carbon relatively quickly.

Carbon in the ocean is also cycled back to the atmosphere very slowly via another set of processes.

Describe these other processes and explain why this way of cycling carbon is very slow.

[2]

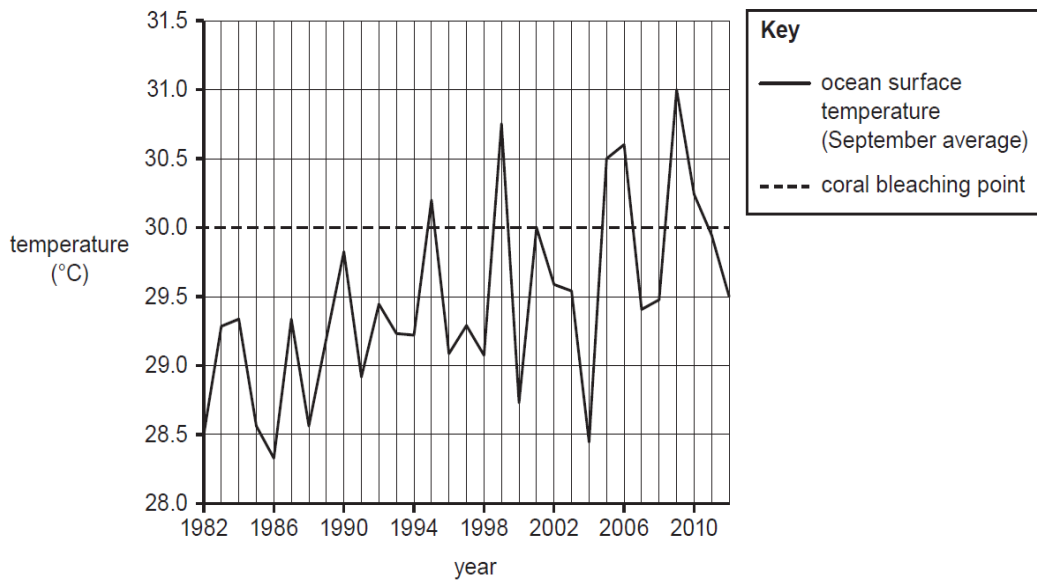
(b)

Human activities are increasing the amount of carbon dioxide in the atmosphere. Carbon dioxide is a greenhouse gas.

Scientists are concerned about the effects that changes in temperature can have on coral reefs in the ocean.

If the ocean temperature rises above 30.0°C, the coral starts to die and turns white. This temperature is called the 'coral bleaching point'.

The graph shows the ocean surface temperature around the Cayman Islands between 1982 and 2012.



(i) The graph shows an overall increase in ocean surface temperature from 1982 to 2012.

Describe **two other** patterns that are visible in the ocean surface temperature data on the graph.

[2]

(ii) Scientists say long-term studies are needed when investigating the effects of climate change.

Use evidence from the graph to justify the scientists' view.

[2]

(iii) Calculate the **overall rate** of change in the ocean surface temperature from 1982 to 2012.

Overall rate of change = °C per year

[2]

(iv) Predict how the line on the graph may have looked in the five years after 2012, **and** explain what this would have meant for coral in the Cayman Islands.

[2]

Total Marks for Question Set 3: 16



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