Human Influences on Ecosystems

Question Paper 7

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Human Influences on Ecosystems
Paper Type	(Extended) Theory Paper
Booklet	Question Paper 7

Time Allowed: **62 minutes**

Score: **/51**

Percentage: **/100**

1 Fig. 5.1 shows the changes in carbon emissions from the burning of three fossil fuels between 1800 and 2000.

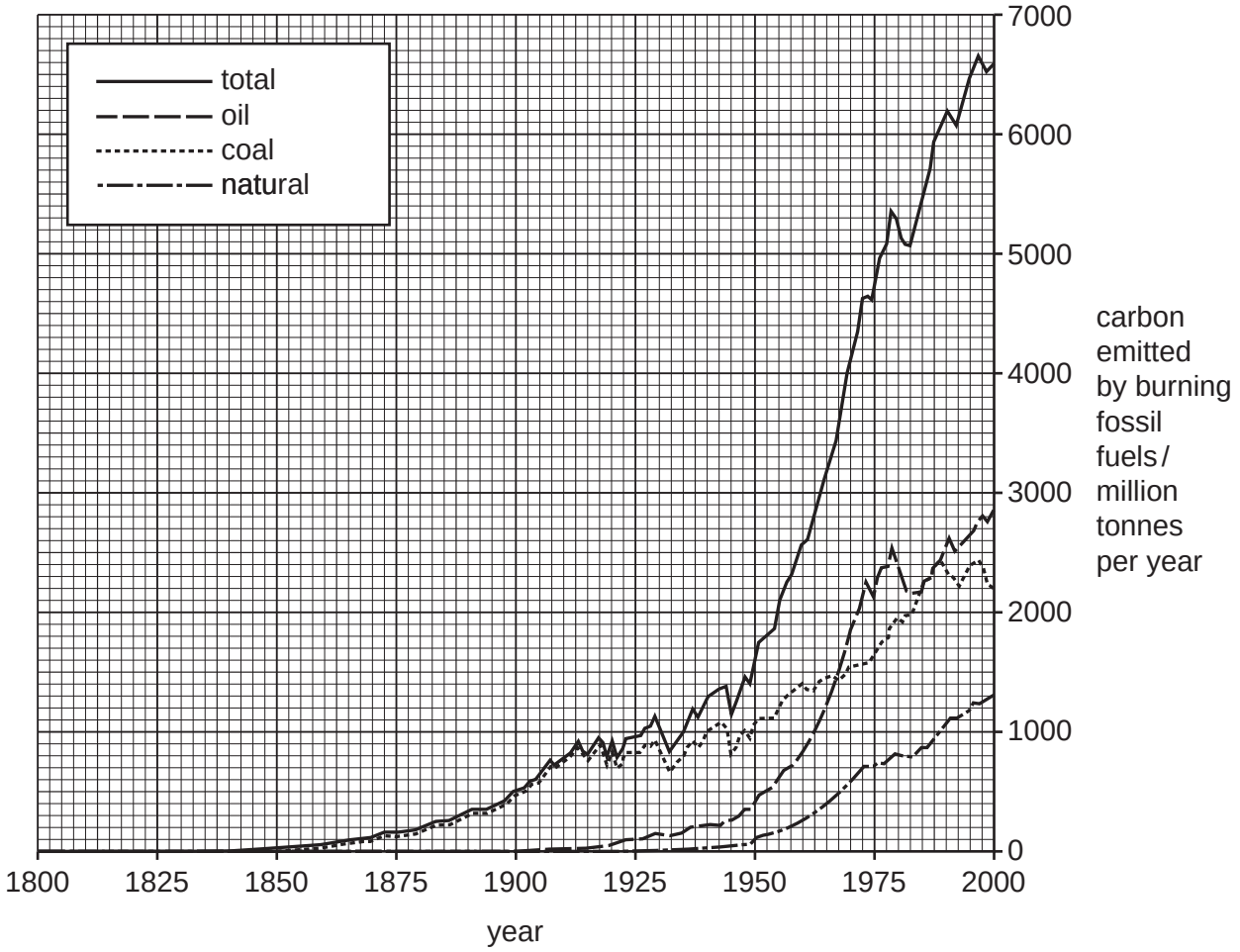

Fig. 5.1

(a) Use the information in Fig. 5.1 to describe the changes in carbon emissions from the burning of fossil fuels between 1800 and 2000.

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All fossil fuels contain hydrocarbons and some also contain compounds of sulfur.

(b) Explain how the combustion of these compounds contributes to pollution.

hydrocarbons .....

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compounds of sulfur .....

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..... [4]

(c) Explain the need to conserve fossil fuels, such as coal, oil and natural gas.

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..... [2]

[Total: 11]

2 Mycoprotein is a form of single cell protein. It is produced by growing the fungus, *Fusarium venenatum*, in a fermenter. As the fungus grows in the fermenter it produces large quantities of hyphae which are extracted and processed as shown in Fig. 3.1.

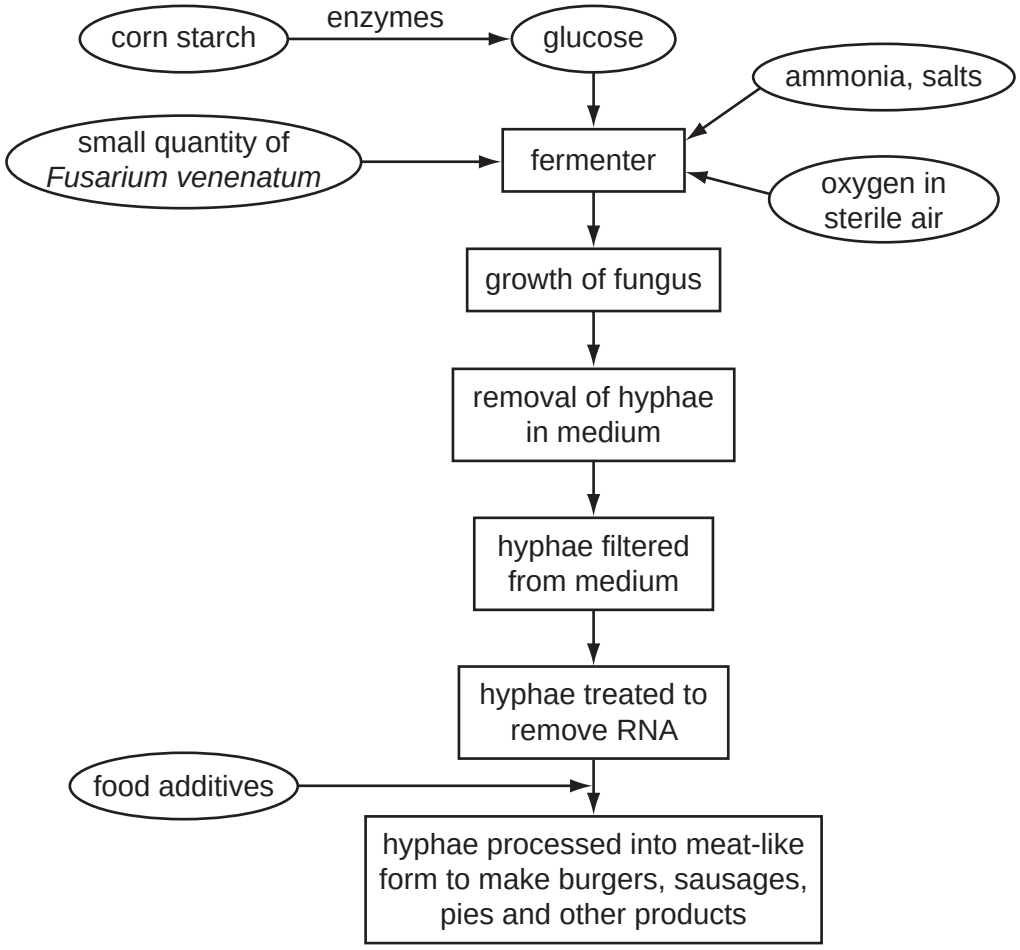

Fig. 3.1

(a) (i) Name an enzyme used to digest the corn starch.

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(ii) Explain why it is necessary to digest the corn starch.

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(b) Explain why sterile conditions are necessary in the fermenter.

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In 2008, there were riots in some parts of the world in protest against shortages of staple foods, such as rice.

(c) Explain why it is better ecologically for people to eat foods made from plants rather than from animal products, such as meat.

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(d) Describe three possible advantages of using foods prepared from mycoprotein as substitutes for animal products, such as meat.

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(e) Discuss whether production of foods made from mycoprotein might **not** reduce food shortages in the future.

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[Total: 14]

3 Fertilisers are used to increase crop yields. Many fertilisers contain compounds of nitrogen and are called 'nitrogen fertilisers'.

The development in the early twentieth century of the Haber-Bosch process for converting nitrogen from the air into ammonia made the production of these fertilisers possible.

(a) Fig. 5.1 shows the global use of nitrogen fertilisers between 1960 and 2003.

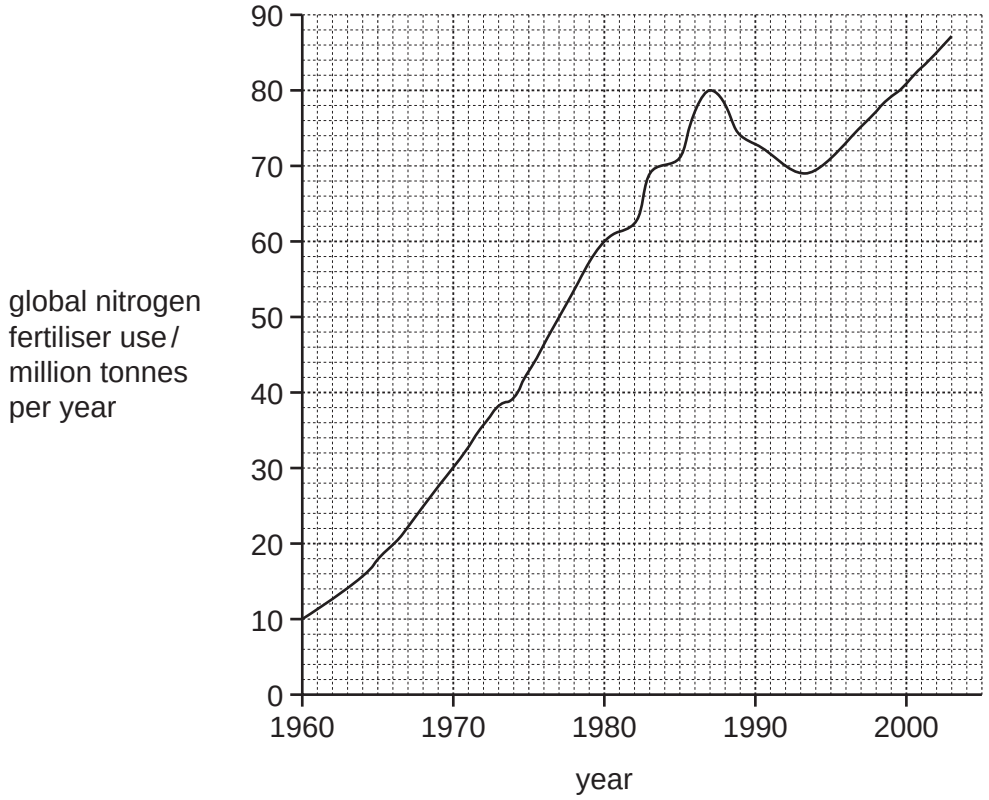

Fig. 5.1

(i) Calculate the percentage increase in the global use of nitrogen fertilisers between 1970 and 1987. Show your working.

Answer .....% [2]

(ii) Explain why the use of nitrogen fertilisers has increased.

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(b) Some farmers increase the fertility of their soils by adding organic fertilisers, such as manure, and by using legume crops in a crop rotation. Manure contains protein, urea and ammonia in the waste from farm animals.

(i) Explain how nitrogen, in the form of nitrate ions, becomes available in a soil after the addition of manure.

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(ii) Explain why legume crops, such as peas, beans, alfalfa and clover are used in crop rotations.

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(c) The overuse of fertilisers can lead to environmental problems. Soils, rivers, lakes, the sea and the atmosphere have all been affected by this pollution.

Outline the undesirable effects of the overuse of fertilisers.

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[Total: 17]

4 Fig. 6.1 shows the Calayan rail, *Gallirallus calayanensis*, a flightless bird that inhabits Calayan Island in the Philippines. This species of bird was discovered in 2004.

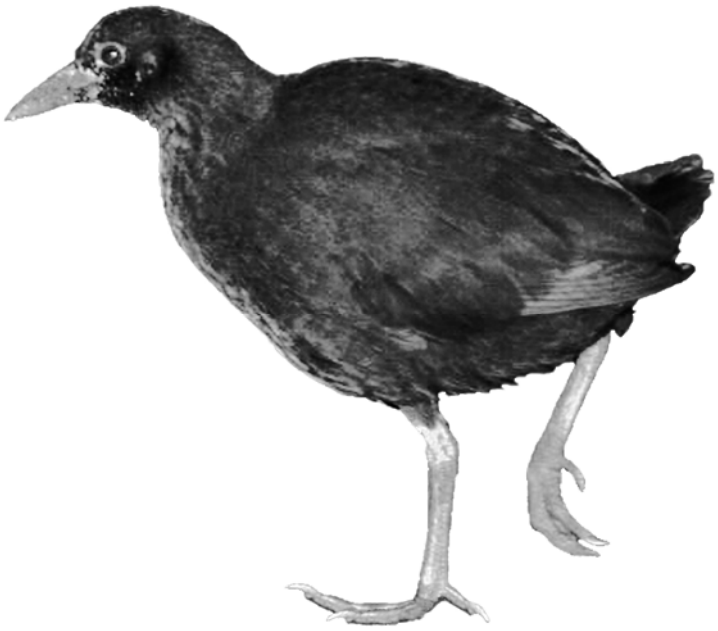

Fig. 6.1

(a) State the name of the genus of the Calayan rail.

.....[1]

Many bird species are threatened by deforestation.

(b) Suggest three reasons why deforestation occurs.

1 .....

2 .....

3 .....[3]

(c) Suggest the likely effects of deforestation on populations of bird species.

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(d) Some species of birds, such as the Calayan rail, are endangered.

Outline the reasons why it is important to conserve species.

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[Total: 9]