Human Influences on Ecosystems

Question Paper 13

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Human Influences on Ecosystems
Paper Type	(Extended) Theory Paper
Booklet	Question Paper 13

Time Allowed: 44 minutes

Score: /36

Percentage: /100

1   Mycoprotein is similar to single cell protein and is sold as an alternative to meat such as beef.

Table 3.1 shows the composition of mycoprotein and beef.

Table 3.1

nutrient	dry mass / g per 100 g	
	mycoprotein	**beef**
protein	49.0	51.4
fat	9.2	48.6
fibre (roughage)	19.5	0.0
carbohydrate	20.6	0.0

(a) (i) State two differences in composition between mycoprotein and beef.

1. ....

2. .... [2]

(ii) Using data from Table 3.1, suggest two reasons why eating mycoprotein is better for health than eating beef.

Explain your answers.

reason 1   ....

explanation   ....

....

reason 2   ....

explanation   ....

.... [4]

(b) (i) Calculate the dry mass of mycoprotein **not** represented by protein, fat, fibre or carbohydrate.

Show your working.

Answer ....g   [2]

(ii) Suggest **one** nutrient that this dry mass might contain.

.... [1]

(c) The antibiotic penicillin is produced by fungi that are grown in a fermenter, as shown in Fig. 3.1. The process is similar to the manufacture of enzymes.
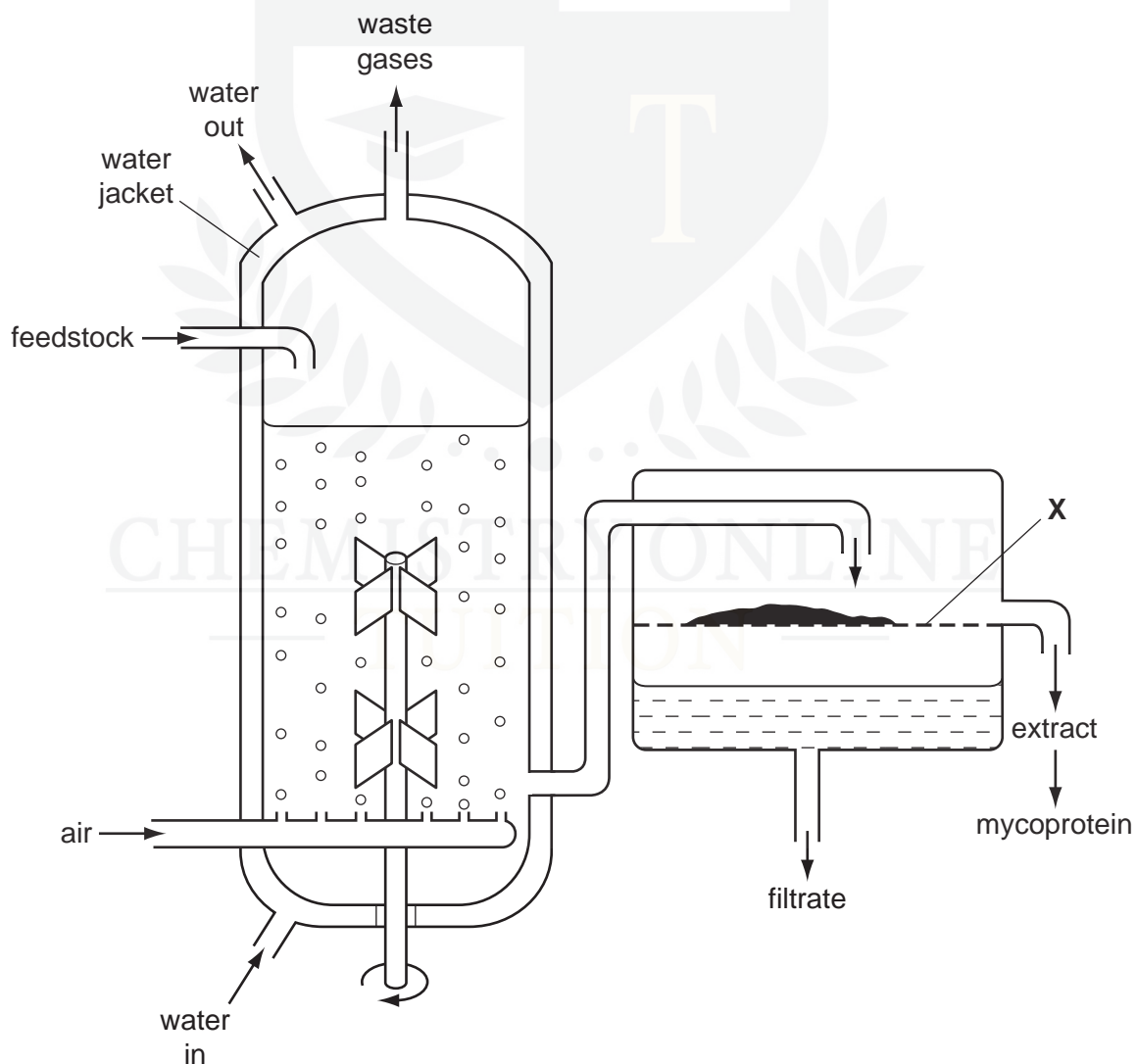

Fig. 3.1

    (i) Name the two raw materials likely to be present in the feedstock.

       1. ....

       2. .... [2]

  (ii) State the function of **X.**

    .... [1]

 (iii) Suggest the name of the main gas present in the waste gases.

    .... [1]

(d) During the fermenting process, the temperature in the container would rise unless steps are taken to maintain a constant temperature.

    (i) Suggest a suitable temperature for the feedstock.

    .... [1]

  (ii) Explain why the temperature rises.

    ....

    .... [2]

 (iii) Explain why a constant temperature has to be maintained.

    ....

    ....

    .... [2]

 (iv) Using the information from Fig. 3.1, suggest **how** a constant temperature is maintained.

    ....

    .... [1]

[Total: 19]

2 In 2003, 25 000 square kilometres of Amazon rainforest were cut down and cleared. The land was then used for agriculture, producing beef and soya beans for export. However, within three years the land was no longer suitable for agriculture and had to be abandoned.

(a) (i) State the term used for cutting down and clearing areas of forest.

.... [1]

(ii) Complete Table 3.1, to state different reasons why forests are cut down. The first has been done for you.

Table 3.1

	reason	
1	for agricultural land	
2		
3		

[2]

(iii) Outline and explain the likely effects of clearing forests.

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.... [6]

(b) Soya beans and beef produced on the land are both good sources of protein. Table 3.2 shows the nutritional content of products made from soya and beef.

Table 3.2

product	nutritional content per 100 g of product			
	energy / kJ	protein / g	saturated fat / g	fibre / g
corned beef	905	26.9	12.1	0.0
soya sausages	1128	19.0	2.1	2.0

(i) Using data from Table 3.2, state and explain two reasons why soya sausages may be healthier than corned beef as a major item in the diet.

1 ....

....

....

2 ....

....

.... [4]

(ii) Soya beans are harvested from plants. Corned beef is produced from cattle that have fed on grass.

Explain why it is more energy efficient for humans to eat soya products as a source of protein than corned beef. Use the food chains involved to support your answer.

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....

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.... [4]

[Total: 17]