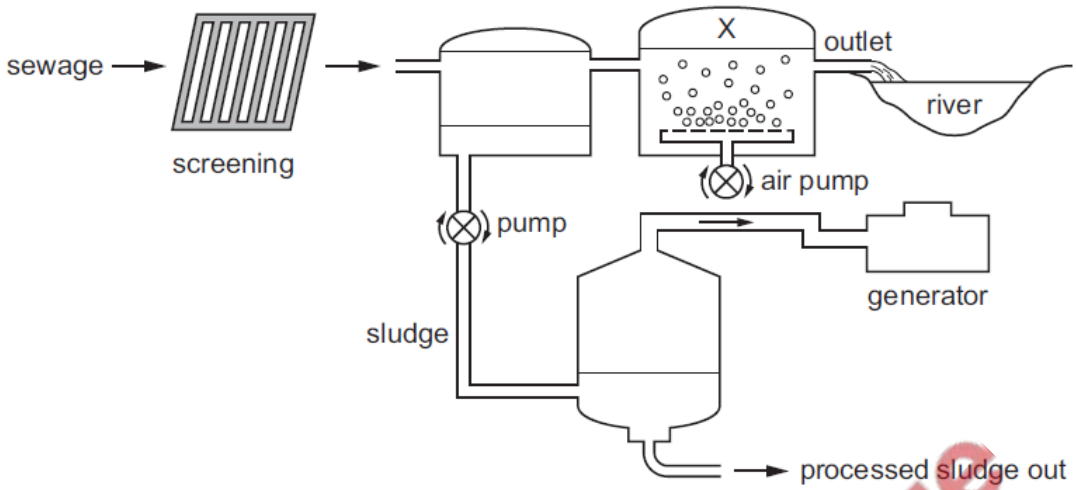
1. Nov/2022/Paper_11/No.40

The diagram shows a sewage treatment process.



What is structure X?

A aeration tank

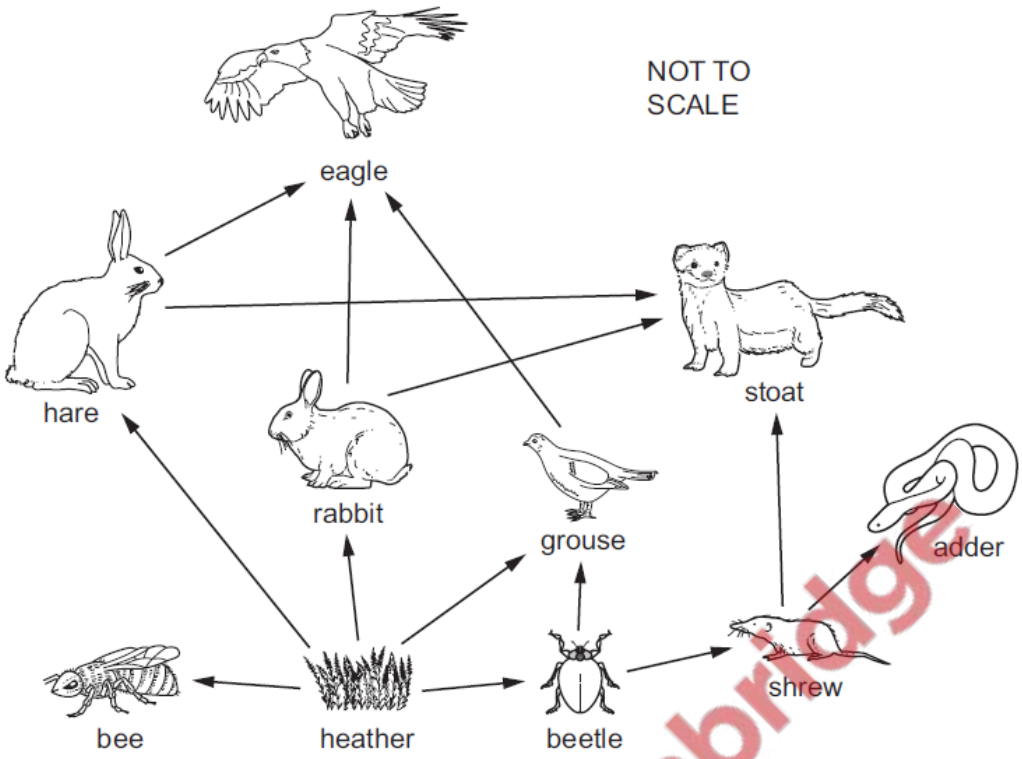
B anaerobic tank

C settlement tank

D storage tank

2. Nov/2022/Paper_21/No.35

The diagram shows a food web.



How many organisms are feeding at more than one trophic level?

A 0 **B** 1 **C** 2 **D** 3

3. Nov/2022/Paper_23/No.37

Bacteria are useful in genetic engineering because they possess plasmids.

Which statement describes the importance of a plasmid?

A It is a circle of DNA and human genes can be inserted into it.

B It is the nucleus of the bacterium and human genes can be inserted into it.

C It can be destroyed and replaced with human insulin.

D It is a circle of DNA and human insulin can be inserted into it.

4. Nov/2022/Paper_23/No.38

Which statement is correct?

A DNA ligase is used to cut DNA.

B DNA ligase is used to make proteins.

C Restriction enzymes are used to cut DNA.

D Restriction enzymes are used to make proteins.

5. Nov/2022/Paper_42/No.4

(a) Fig. 4.1 is a flow chart showing some of the processes that occur in a biofuels power plant.

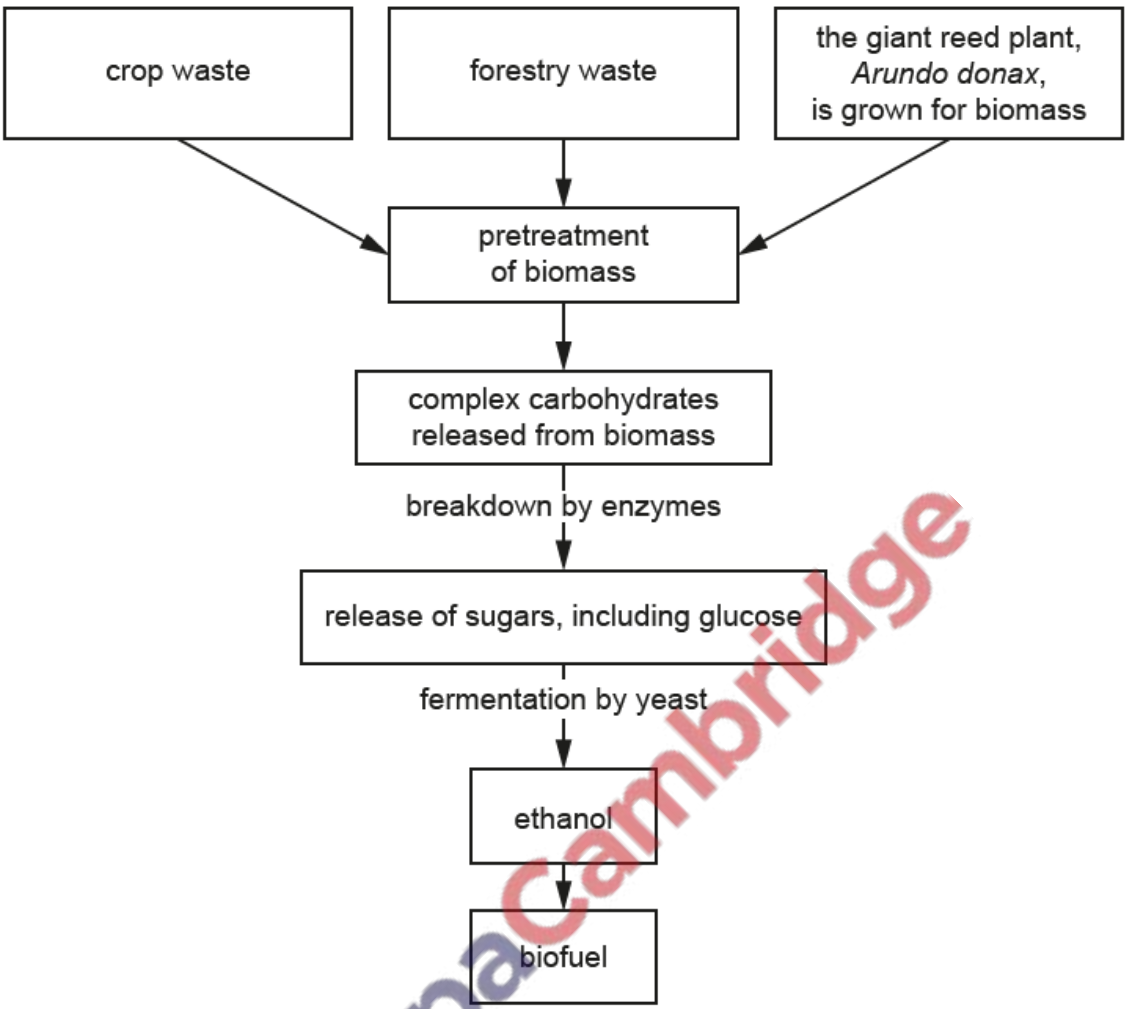


Fig. 4.1

(i) The fermentation stage shown in Fig. 4.1 requires yeast.

Complete the balanced chemical equation to show how ethanol is produced by yeast respiration.

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[2]

(ii) Using the information in Fig. 4.1, suggest the environmental advantages of using ethanol as a fuel.

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..... [3]

(iii) Farmers grow giant reed plants as monocultures.

Describe the disadvantages of growing giant reed plants to provide biomass for the production of biofuels.

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..... [2]

(b) One problem with using biomass in the process shown in Fig. 4.1 is that the breakdown stage produces a sugar called xylose and ethanoic acid. Yeast cannot use xylose, and ethanoic acid is toxic to yeast.

Scientists genetically engineered a type of yeast that can use xylose and ethanoic acid.

Fig. 4.2 shows the results of one of the trial experiments done by the scientists using their new genetically engineered yeast.

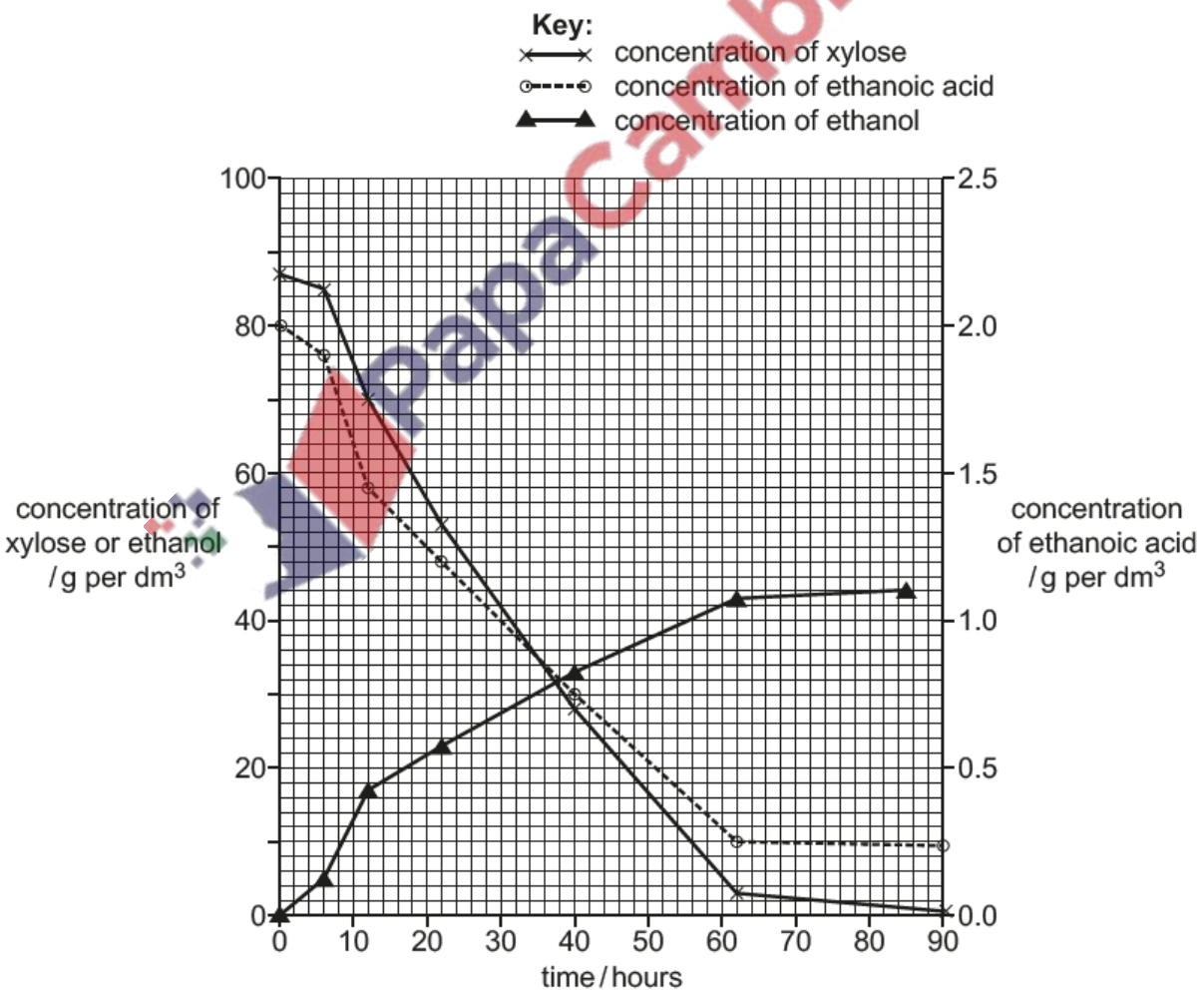

Fig. 4.2

(i) Describe the results shown in Fig. 4.2.

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..... [3]

(ii) The experiment was done at 30 °C.

The scientists repeated the experiment at 20 °C.

Predict the results that you would expect for the concentration of ethanol.

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..... [1]

[Total: 11]