1 **(a)** Define the term *enzyme*.

.....

..... [2]

(b) Enzymes are used in biological washing powders.

(i) Describe how the presence of these enzymes may increase the efficiency of the washing powder in removing stains from clothes.

.....

.....

.....

..... [3]

(ii) Explain why the temperature of the wash needs to be carefully controlled.

.....

.....

.....

..... [3]

(iii) Suggest a suitable temperature for a wash using a biological washing powder. Explain your answer.

Suitable temperature .....

Explanation .....

..... [1]

(c) Outline how enzymes can be manufactured for use in biological washing powders.

.....

.....

.....

.....

..... [4]

[Total: 13]

2 Fig. 5.1 is a diagram showing the events from pollination to fertilisation in a species of flowering plant.

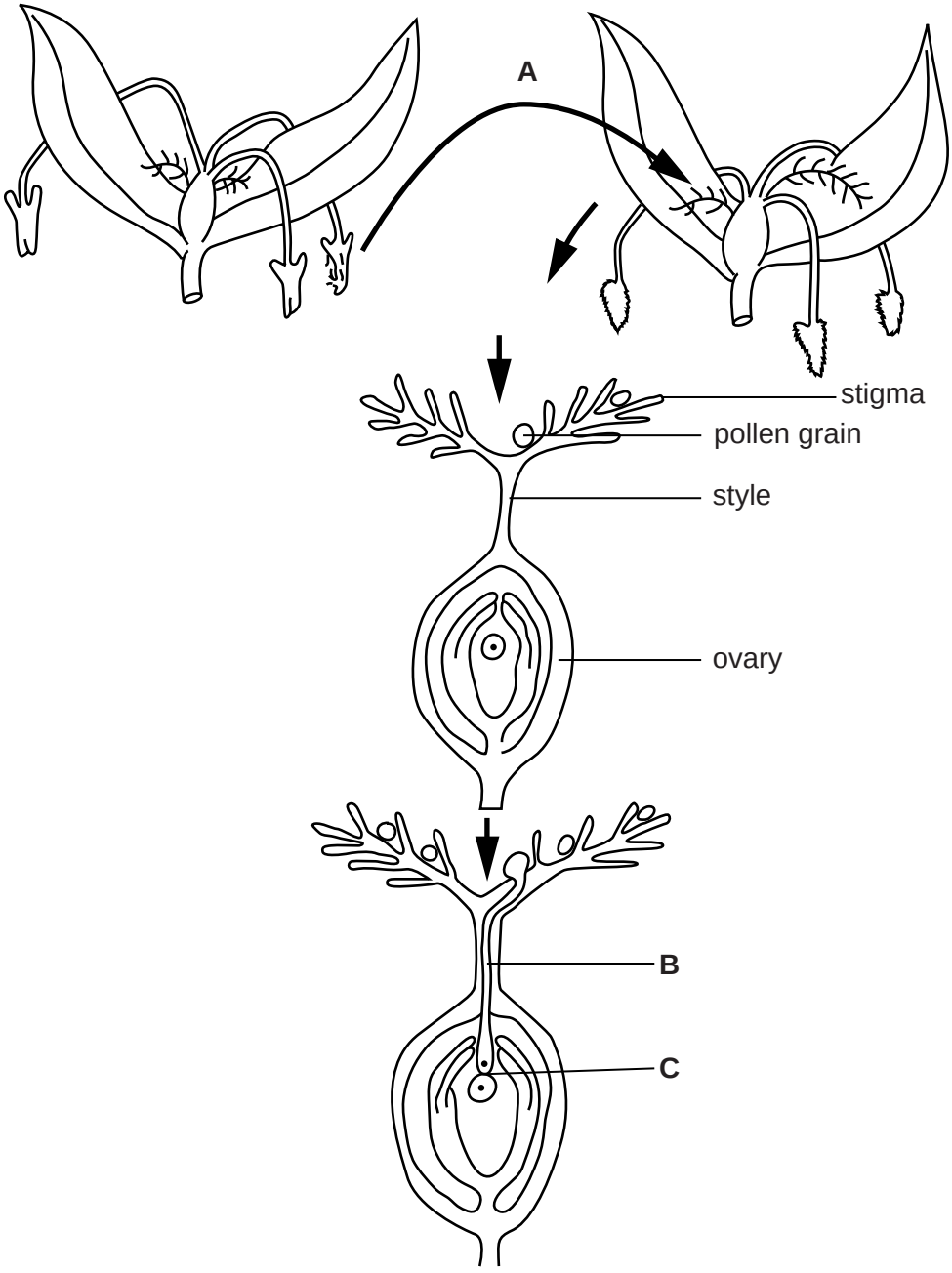

Fig. 5.1

(a) Name the likely method of pollination for the flowers shown at **A** in Fig. 5.1. Give an explanation for your choice.

method of pollination .....

explanation .....

.....

.....

.....

[3]

(b) In Fig. 5.1 pollen is transferred from one plant to another.

State the name for this type of pollination.

.....[1]

(c) Name structure **B** shown in Fig. 5.1 and state its function.

.....

.....

.....[2]

(d) Fertilisation occurs at **C** as shown in Fig. 5.1.

Describe what happens at fertilisation in flowering plants.

.....

.....

.....

.....

.....[2]

(e) Seed formation occurs after fertilisation. Seeds are formed inside the fruits and then dispersed.

(i) Name the part of the flower that develops into the seed.

.....[1]

(ii) Name the part of the flower that develops into the fruit.

.....[1]

(iii) State an advantage of seed dispersal.

.....

.....[1]

(f) Seed germination occurs when conditions are suitable.

Explain the role of enzymes in seed germination.

.....

.....

.....

.....

.....[2]

[Total: 13]

3 Fig. 1.1 is a photomicrograph of a leaf of the tea plant, *Camellia sinensis*.

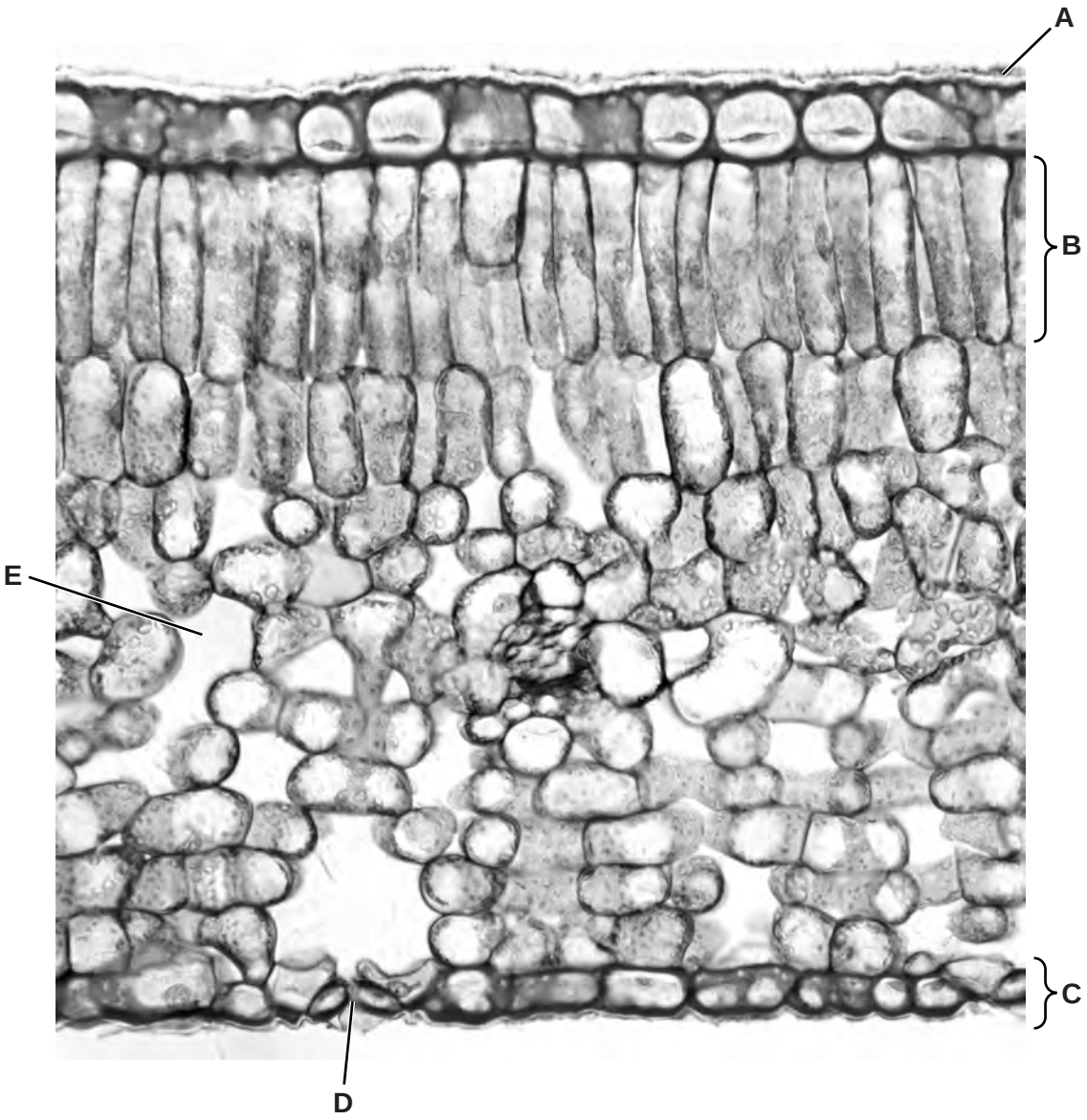

Fig. 1.1

(a) Name **A** to **E**.

A .....

B .....

C .....

D .....

E .....[5]

(b) Fig. 1.2 shows a cell from region **B** of the leaf shown in Fig. 1.1.

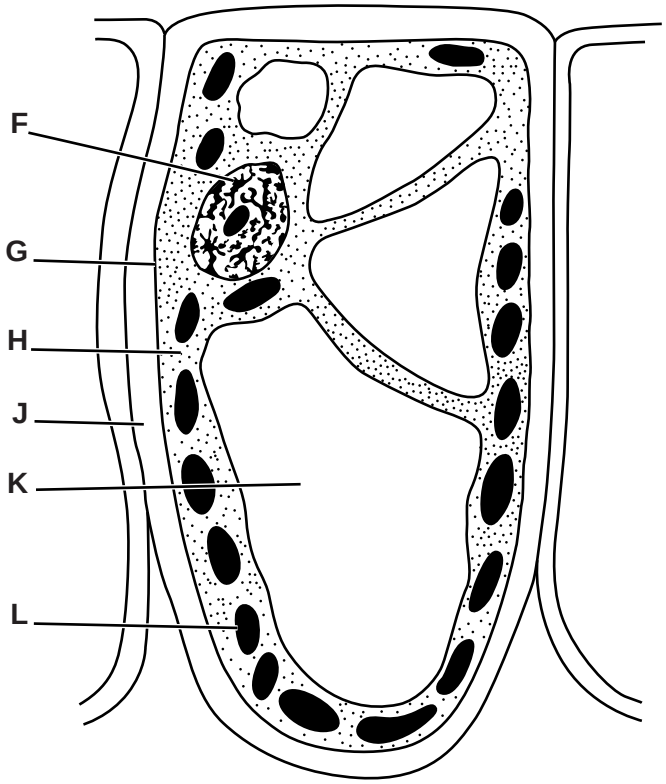

Fig. 1.2

Use the letters from Fig. 1.2 to complete Table 1.1.

Write **one** letter only in each box to identify the function. You may use each letter once, more than once or not at all.

Table 1.1

function	letter from Fig. 1.2
controls movement of substances into and out of the cell	
exerts a pressure to help maintain the shape of the cell	
produces sugars using light as a source of energy	
withstands the internal pressure of the cell	
controls all the activities of the cell	

[5]

(c) The enzyme catalase is found in lettuce leaves.

A student investigated the activity of this enzyme by grinding some lettuce leaves and adding them to a solution of hydrogen peroxide. The volume of oxygen produced was measured until the reaction stopped.

The student's results are shown in Fig. 1.3.

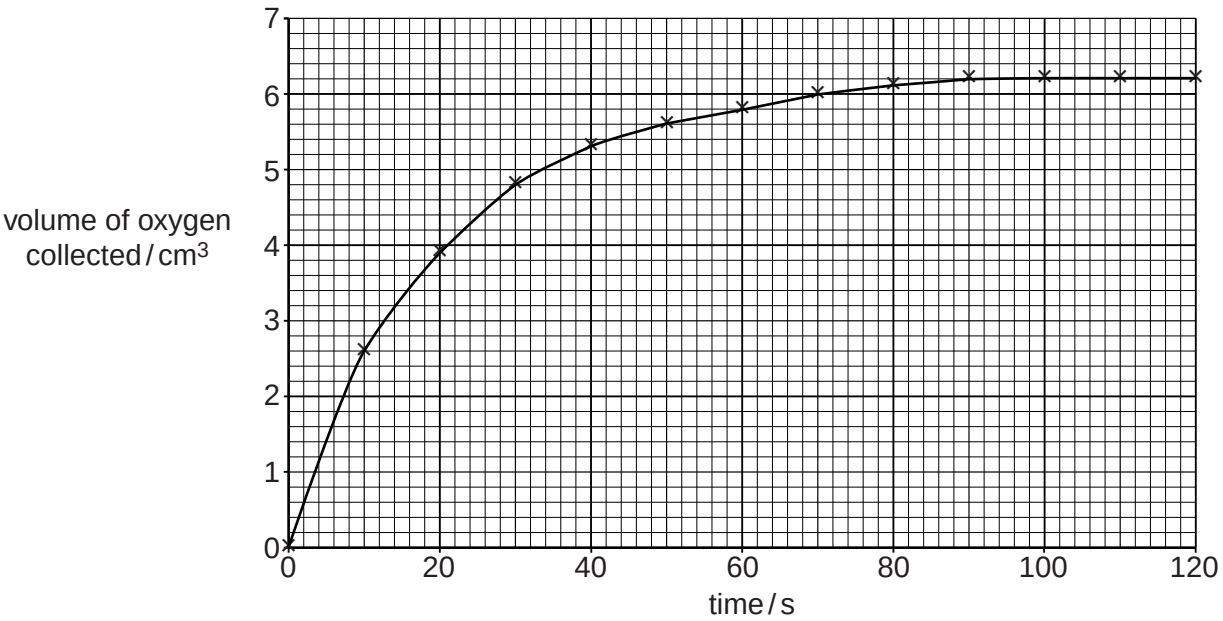

Fig. 1.3

(i) Describe the results shown in Fig. 1.3. You will gain credit if you use the data in your answer.

.....

.....

.....

.....

.....

.....

.....[3]

(ii) Explain the action of enzymes during a reaction.

.....

.....

.....

.....

.....

.....

.....[3]

[Total: 16]

4 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.

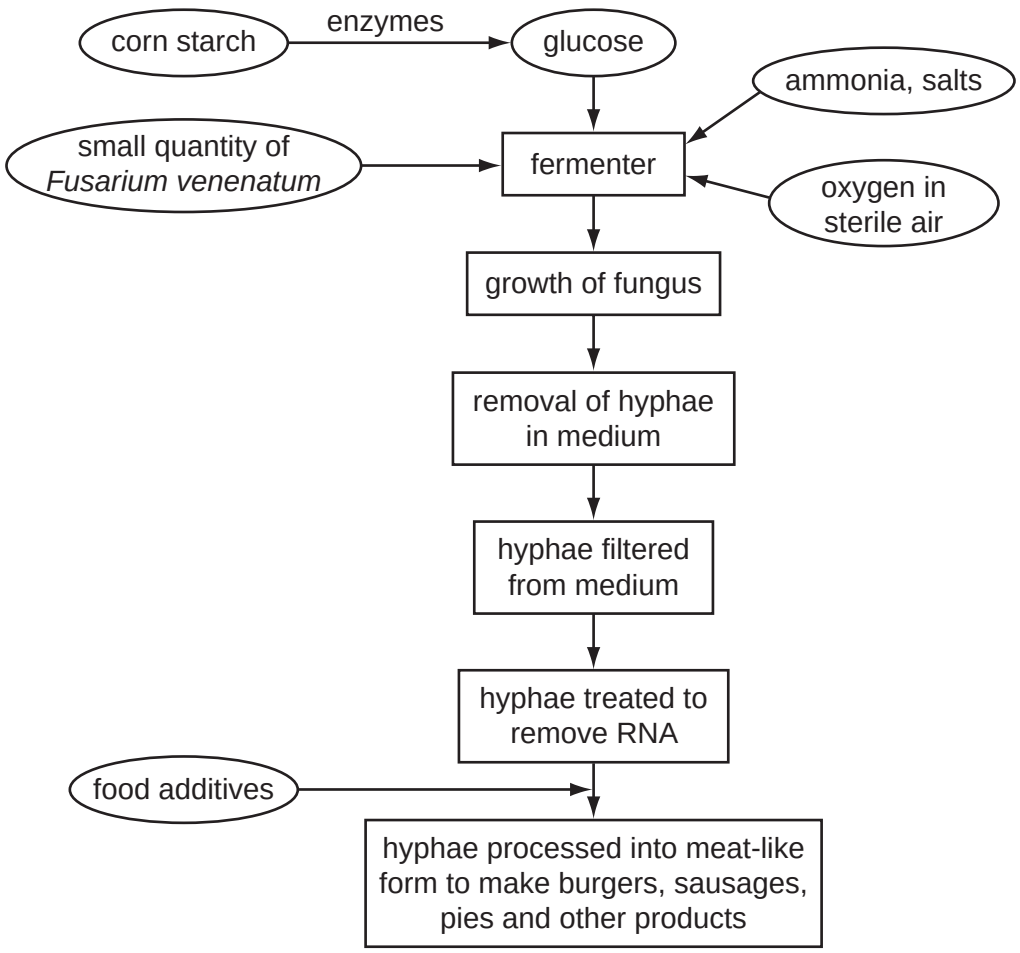

Fig. 3.1

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

.....

[1]

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

.....

.....

.....

.....

[2]

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

.....

.....

.....

..... [2]

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.

.....

.....

.....

.....

.....

..... [3]

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

1 .....

.....

2 .....

.....

3 .....

..... [3]

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

.....

.....

.....

.....

.....

..... [3]

[Total: 14]