Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						4	4	3	7	/	1	F	Signature	

Paper Reference(s)

4437/1F

Examiner's use only

Team Leader's use only

London Examinations IGCSE

Science (Double Award)

Biology

Paper 1F

Foundation Tier

Friday 18 May 2007 – Morning

Time: 1 hour 15 minutes

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Materials required for examination
Nil

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).
The paper reference is shown at the top of this page. Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Show all the steps in any calculations and state the units.
Calculators may be used.

Information for Candidates

The total mark for this paper is 75. The marks for the parts of questions are shown in round brackets: e.g. **(2)**.
There are 20 pages in this question paper. All blank pages are indicated.

Advice to Candidates

Write your answers neatly and in good English.

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Turn over

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Leave blank

Answer ALL the questions. Write your answers in the spaces provided.

1. (a) The picture shows part of a plant.

What part of the plant does the picture show? Put a cross (☒) in the correct box.

leaf ☒

flower ☒

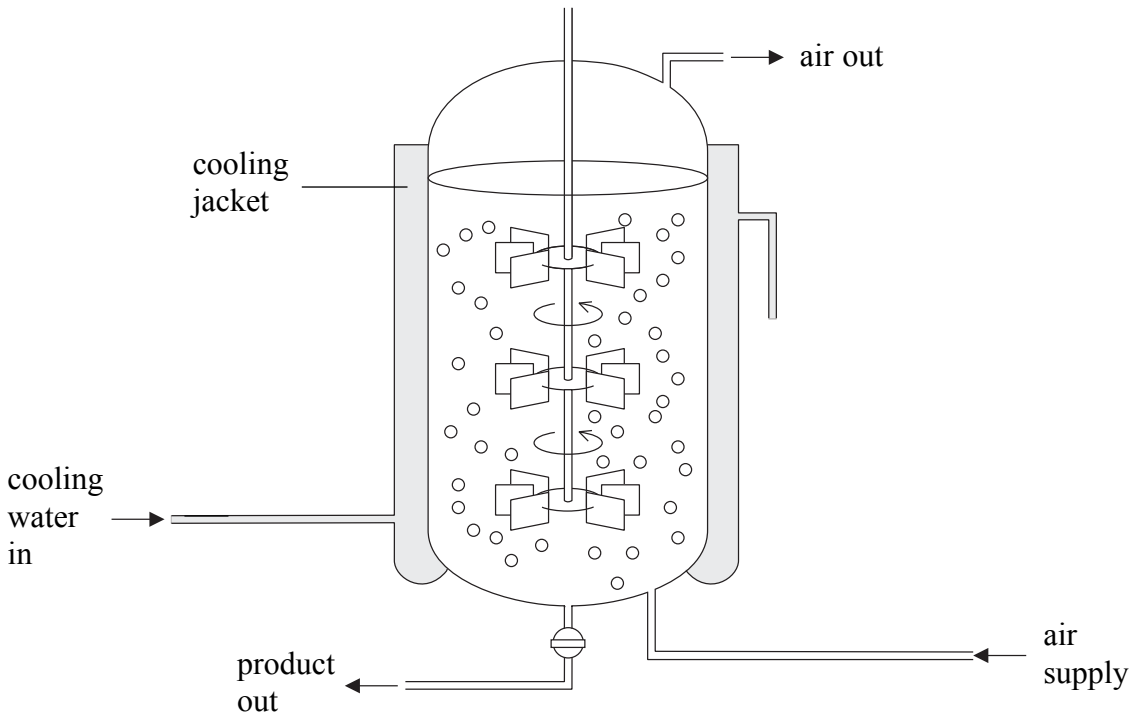
root ☒

stem ☒

(1)

Leave blank

(b) The diagram shows the apparatus used to grow genetically modified bacteria.



What is the name given to the apparatus used? Put a cross (☒) in the correct box.

beaker ☒

fermenter ☒

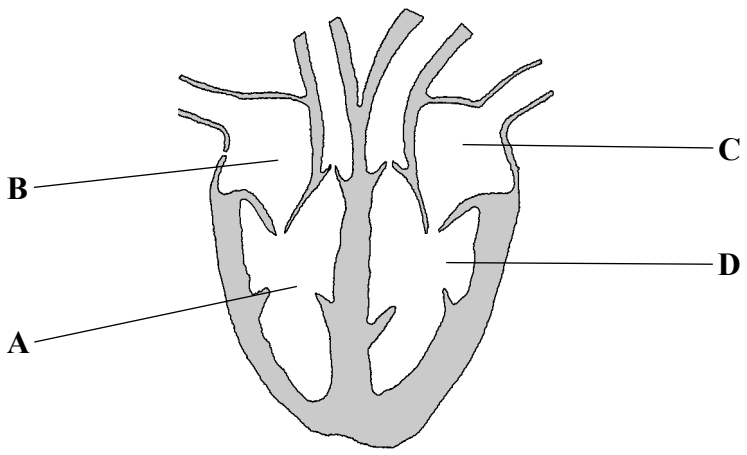
vacuum flask ☒

bottle ☒

(1)

Leave blank

(c) The diagram shows a section through the human heart.



Which chamber pumps blood to the body? Put a cross (☒) in the correct box.

A ☒

B ☒

C ☒

D ☒

(1)

(d) Which process do plants use to make their food? Put a cross (☒) in the correct box.

diffusion ☒

osmosis ☒

photosynthesis ☒

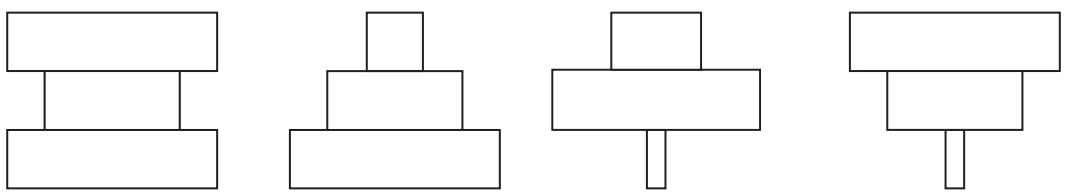
respiration ☒

(1)

(e) A simple food chain is shown below.

plants → small animals → large birds

Which is the pyramid of biomass for this food chain? Put a cross (☒) in the correct box.



☒ ☒ ☒ ☒

(1)

Leave blank

(f) Which gas is produced by yeast when beer is made? Put a cross (☒) in the correct box.

carbon dioxide ☒

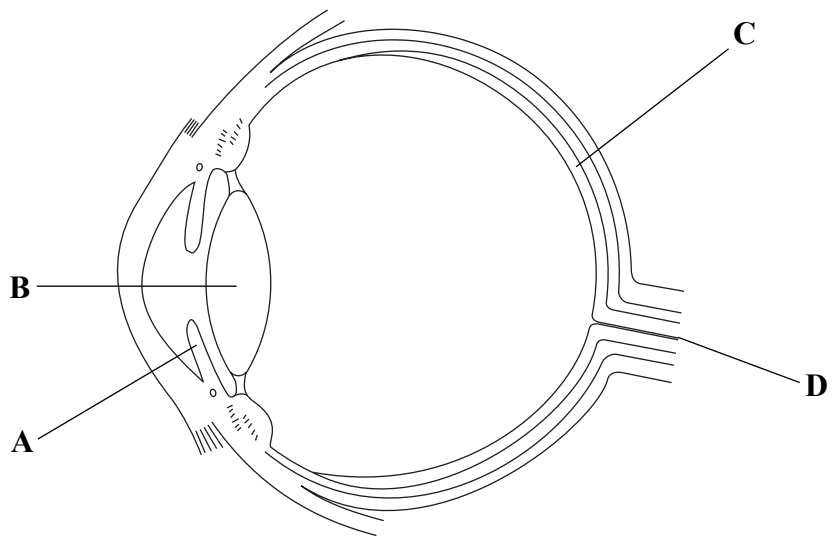
methane ☒

oxygen ☒

sulphur dioxide ☒

(1)

(g) The diagram shows a section of the human eye.



Which part of the eye detects light? Put a cross (☒) in the correct box.

A ☒

B ☒

C ☒

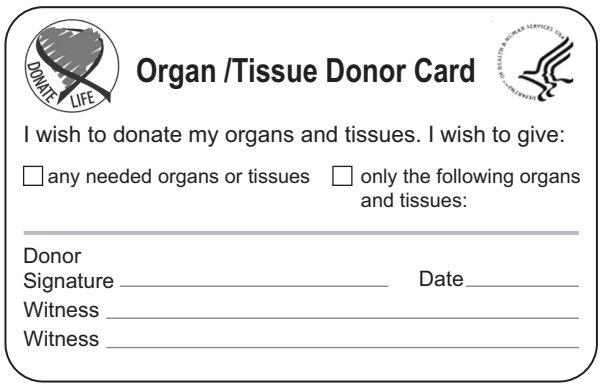
D ☒

(1) **Q1**

(Total 7 marks)

Leave blank

2. Some people carry donor cards like the one shown.



This means that when they die, their body parts can be given to people who need them.

The table gives the function of body parts that are commonly donated. Complete the table by naming the donated body part. Choose words from the list to complete the table.

The first answer has been done for you.

cornea **heart** **kidney**

lung **pancreas** **skin**

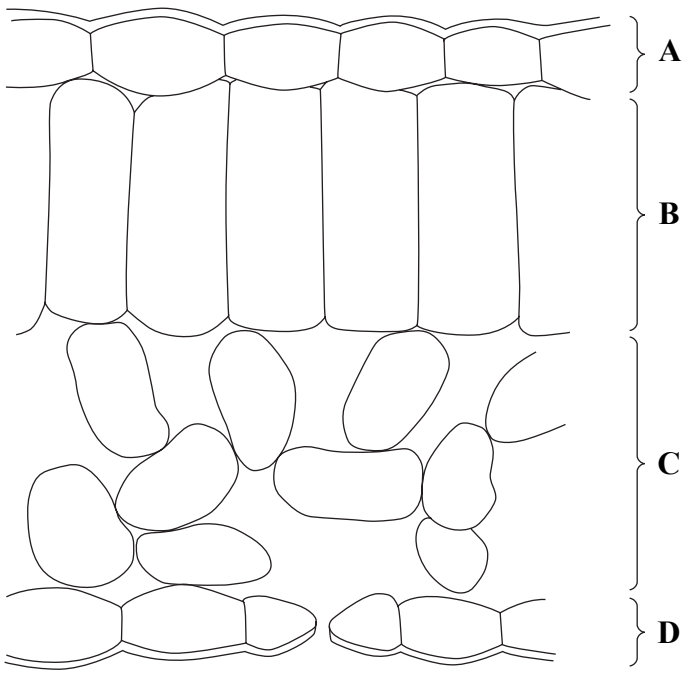
Function	Donated body part
breaks down toxic chemicals	liver
produces urine	
pumps blood around the body	
fills with air during breathing	
bends light as it enters the eye	
secretes insulin	

Q2

(Total 5 marks)

Leave blank

3. The diagram shows a section through a leaf separated into four regions **A**, **B**, **C** and **D**.



Answer the following questions by putting a cross (☒) in the correct box.

(a) In which region is the waxy cuticle found?

A ☒ **B** ☒ **C** ☒ **D** ☒

(1)

(b) In which region are stomata found?

A ☒ **B** ☒ **C** ☒ **D** ☒

(1)

(c) In which region are palisade cells found?

A ☒ **B** ☒ **C** ☒ **D** ☒

(1)

(d) In which region is the xylem found?

A ☒ **B** ☒ **C** ☒ **D** ☒

(1) **Q3**

(Total 4 marks)

Leave blank

4. Mammals produce milk to feed their young.

The table shows the amount of three food substances in milk from four different mammals.

Mammal	Amount of food substance in g per dm^3		
	Fat	**Protein**	**Sugar**
cow	37	34	48
human	38	10	70
polar bear	331	109	3
rabbit	183	139	21

(a) (i) Which mammal produces the most sugar in their milk?

.....

(1)

(ii) How much more protein is found in milk from rabbits compared to milk from cows?

..... g per dm^3

(1)

(b) The sentences below describe what happens to milk protein in the stomach of a baby. Choose the correct word or phrase from the list to complete each sentence.

amino acids **amylase** **fatty acids**

hydrochloric acid **lactic acid** **protease**

The protein is digested into small molecules called .....

The enzyme used to digest the protein is called .....

The acid used to help this enzyme is called .....

(3)

(c) Polar bear milk contains the most fat. Suggest how this would help a young polar bear to survive.

.....

.....

.....

.....

(2)

Leave blank

(d) Babies are usually fed only on milk in the first few weeks of their lives. Fat, protein and sugar are needed in a balanced diet.

Name **two** other food substances that must be in breast milk to provide a balanced diet for a baby.

1 .....

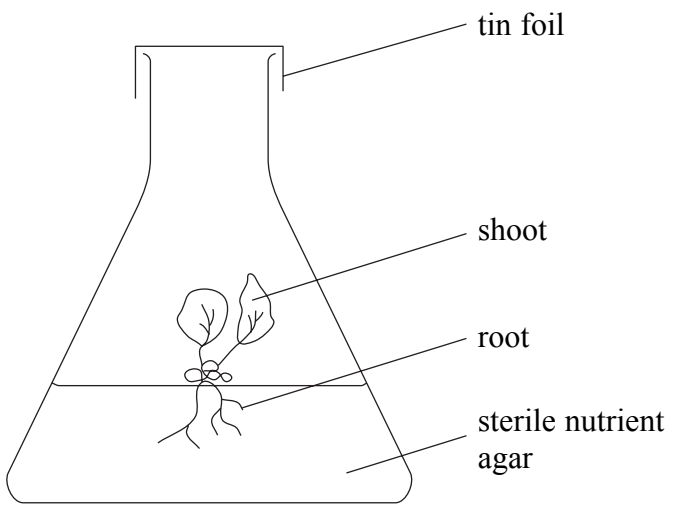
2 .....

(2) **Q4**

(Total 9 marks)

Leave blank

5. Micropropagation (tissue culture) is used to produce lots of identical plants. The plants are grown inside glass flasks on a jelly called agar. The diagram shows one of these plants in a glass flask.



(a) Give **two** functions of the roots of the plant inside the glass flask.

1 .....

2 .....

(2)

(b) What does the word **sterile** mean?

.....

(1)

(c) Name **one** mineral nutrient that should be in the agar.

.....

(1)

(d) Suggest why it is important to cover the opening of the glass flask with tin foil.

.....

.....

.....

(2)

(e) The glass flasks are kept in conditions so that photosynthesis can occur. Name **two** conditions that are needed for photosynthesis.

1 .....

2 .....

(2) **Q5**

(Total 8 marks)

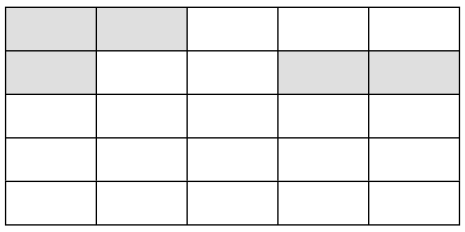
Leave blank

6. (a) The diagram shows two brick walls. One wall is near a source of sulphur dioxide pollution. The other wall is far from any source of sulphur dioxide pollution.

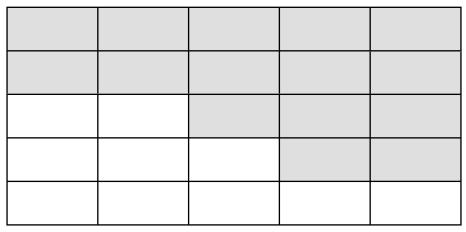
Some very small plants can grow on brick walls. The number of bricks covered by these small plants on each of these walls is recorded.

Key brick covered by plant

brick not covered by plant



Wall near to sulphur dioxide source



Wall far from sulphur dioxide source

Use the key and the diagrams to complete the table below.

Results	Wall near to sulphur dioxide source	Wall far from sulphur dioxide source
total number of bricks	25	25
number of bricks covered by plant	5	
percentage of bricks covered by plant	20	

(2)

(b) What do these results suggest about the effect of sulphur dioxide gas on the growth of plants?

.....

.....

.....

.....

(2)

Q6

(Total 4 marks)

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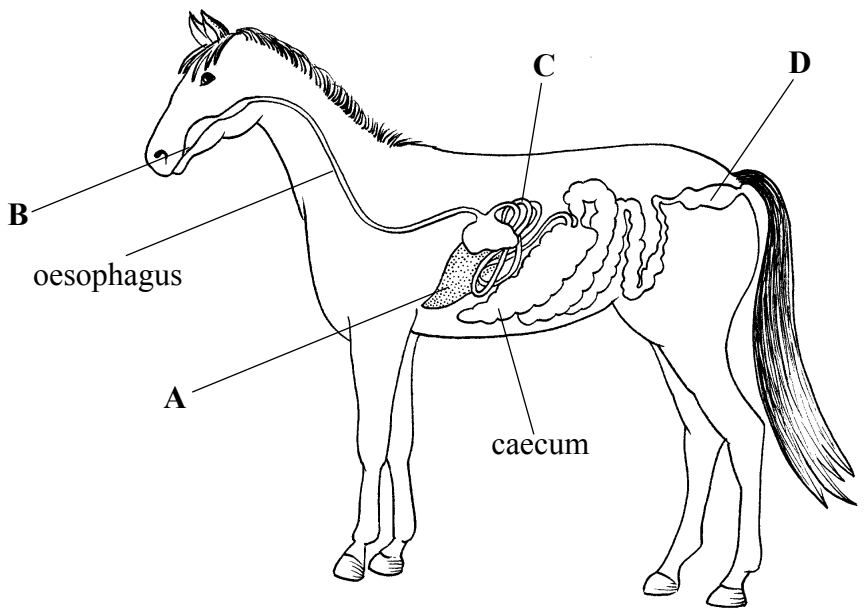
7. The horse is a mammal and the digestive system is similar to that of humans.

The diagram shows the digestive system of a horse with parts labelled **A**, **B**, **C** and **D**.



(a) The statements below are about the digestive system. Choose the correct letter to match each statement. Put a cross (☒) in the correct box.

This is where plant food is chewed **A** ☒ **B** ☒ **C** ☒ **D** ☒

This is where faeces are stored **A** ☒ **B** ☒ **C** ☒ **D** ☒

This is where most villi are found **A** ☒ **B** ☒ **C** ☒ **D** ☒

(3)

(b) Explain how food is moved along the oesophagus.

.....

.....

.....

.....

(2)

Leave blank

(c) The caecum contains bacteria. These bacteria help the horse by digesting the carbohydrate in plant cell walls and by making vitamin C.

(i) Name the carbohydrate found in plant cell walls.

.....

(1)

(ii) Why does a horse need vitamin C?

.....

.....

(1)

(d) The table gives the energy needed by the horse at increasing levels of exercise from a slow walk to a gallop.

Level of exercise	**Energy needed in kJ per kg per hour**
slow walk	7.1
fast walk	10.5
slow trot	27.1
medium trot	39.7
fast trot	57.3
gallop	96.1

(i) Describe the relationship between the level of exercise and energy needed.

.....

.....

(1)

(ii) A horse weighing 500 kg walks fast for one hour. How much energy does it use?

.....

..... kJ

(1)

Q7

(Total 9 marks)

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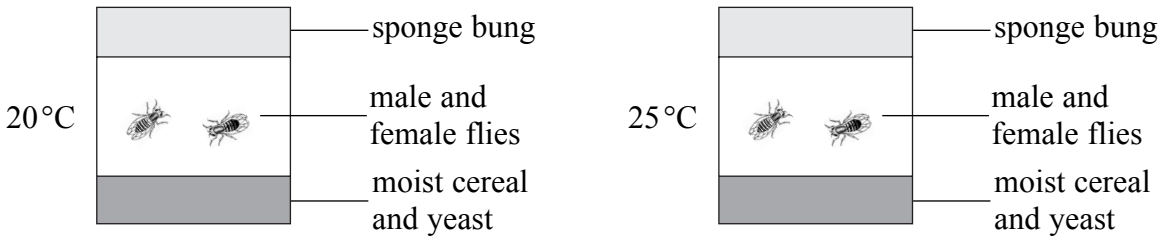
8. The tubes below were used to breed insect flies. One tube was kept at 20 °C and the other tube was kept at 25 °C. Each tube contained one male and one female fly.



(a) (i) The sponge bung stops the flies escaping. It also allows gases to enter and leave the tube. Name **one** gas used by the flies and **one** gas produced by the flies.

gas used .....

gas produced .....

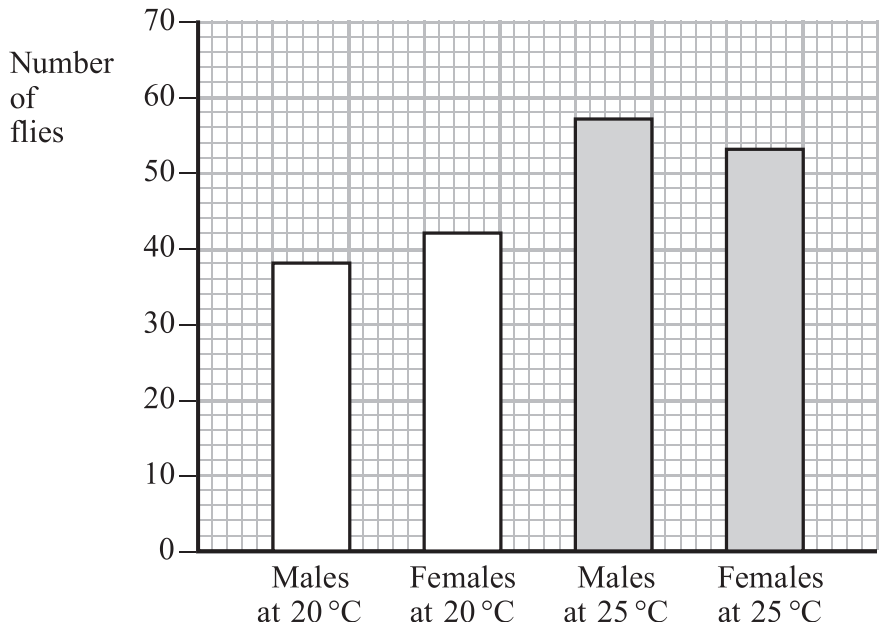
(1)

(ii) The flies feed on the yeast cells and the yeast cells feed on the cereal. Use this information to draw a food chain in the space below.

(2)

Leave blank

(b) The graph shows the number of male and female offspring produced in each tube after two weeks.



(i) How many male offspring were produced after two weeks at 20 °C?

.....

(1)

(ii) More male offspring were produced after 2 weeks at 25 °C than at 20 °C. Calculate the percentage increase at the higher temperature. Show your working.

..... % increase

(2)

(c) Suggest why more offspring were produced after two weeks at 25 °C.

.....

.....

.....

.....

(2)

Leave blank

(d) (i) Equal numbers of male and female offspring were expected at 20 °C.

Use your knowledge of how sex chromosomes are inherited to show why. You may use a genetic diagram in your answer.

.....

.....

.....

.....

(5)

(ii) Suggest **one** reason why equal numbers of male and female offspring were not obtained at 20 °C.

.....

.....

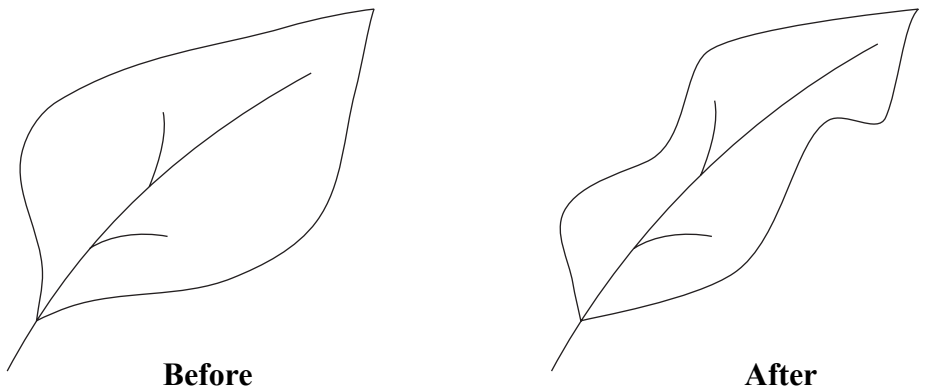
(1)

Q8

(Total 14 marks)

Leave blank

9. The diagram shows a leaf from a crop plant before and after it was attacked by an insect pest.



Before **After**

(a) Suggest how the insect pests would affect crop yield.

.....

.....

.....

.....

.....

.....

.....

(3)

(b) Explain why farmers often spray pesticide onto their crops.

.....

.....

.....

.....

(2)

Leave blank

(c) The table shows the changes in the numbers of an insect pest in a glasshouse during a period of 50 days. The crop was sprayed with pesticide twice during this time.

Time in days	Number of insects in thousands
0	44
5	54
6	6
14	8
20	12
28	20
29	16
35	28
42	42
50	54

(i) The crop was first sprayed with pesticide on day 5. Use the data in the table to suggest the day on which the crop was sprayed with pesticide for the second time.

.....

(1)

(ii) What was the decrease in numbers of the insect after spraying with pesticide on day 5?

.....

(1)

(d) Give **two** disadvantages of using pesticides.

1 .....

.....

.....

2 .....

.....

.....

(2) **Q9**

(Total 9 marks)

PLEASE TURN OVER FOR QUESTION 10

Leave blank

10. *Campylobacter jejuni* is a bacterium that causes food poisoning. Most people recover from this illness, but in some people serious problems occur.

The effects could lead to kidney failure and damage to red blood cells.

(a) (i) Name **one** substance that would not be removed from the body if the kidneys failed.

.....

(1)

(ii) Why would damage to red blood cells lead to problems?

.....

.....

(1)

(b) Another effect can be damage to nerve cells. This is caused when nerve cells are damaged by the antibodies that the body produces to attack the *Campylobacter* bacteria.

(i) Name the cells in the body that produce antibodies.

.....

(1)

(ii) Damage to nerve cells that control breathing can lead to paralysis. The paralysis occurs because the muscles involved in breathing do not receive impulses to make them contract.

Explain why paralysis of breathing muscles is dangerous.

.....

.....

.....

.....

.....

.....

(3) **Q10**

(Total 6 marks)

TOTAL FOR PAPER: 75 MARKS

END