



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

1. For each question (a) to (j), choose the correct answer. Put a cross (☒) in the correct box.

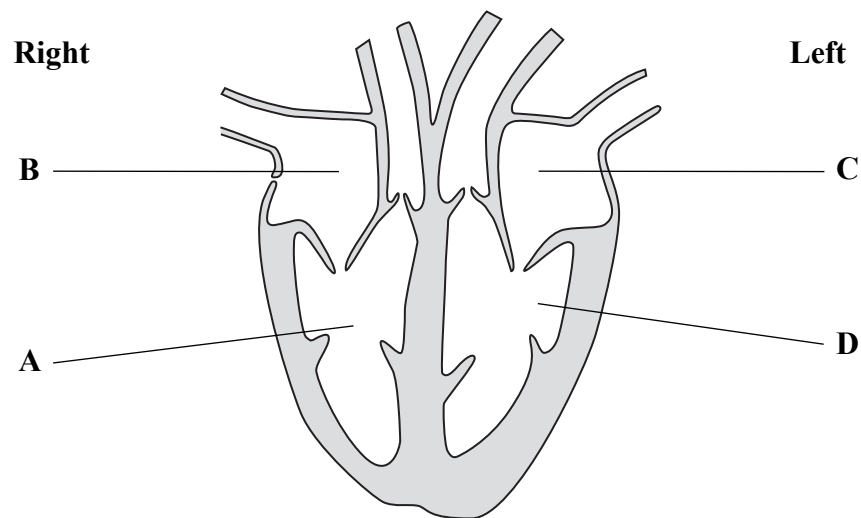
(a) Reproduction is a characteristic of all living organisms.

Another characteristic of all living organisms is

- A combustion
- B growth
- C photosynthesis
- D transpiration

(1)

(b) The diagram shows a section of a heart viewed from the front.



Which chamber receives blood from the lungs?

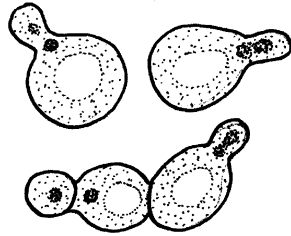
- A
- B
- C
- D

(1)



Leave  
blank

(c) The diagram shows some yeast cells dividing. Yeast is



- A a fungus
- B a bacterium
- C an animal
- D a virus

(1)

(d) A yeast cell divides every 20 minutes.

Starting with one yeast cell, how many yeast cells would there be after one hour?

- A 2
- B 4
- C 8
- D 16

(1)

(e) The list gives terms that describe different levels of organisation within organisms.

cell  
organ  
organelle  
tissue

Which term describes the smallest level of organisation?

- A cell
- B organ
- C organelle
- D tissue

(1)



N 3 6 8 6 0 A 0 3 2 8

Leave blank

(f) The table shows structures involved in reproduction.

Which row is correct?

	Animals		Plants		
	Male	Female	Male	Female	
<b>A</b>	pollen	ovules	sperm	eggs	<input type="checkbox"/>
<b>B</b>	eggs	pollen	ovules	sperm	<input type="checkbox"/>
<b>C</b>	ovules	sperm	eggs	pollen	<input type="checkbox"/>
<b>D</b>	sperm	eggs	pollen	ovules	<input type="checkbox"/>

(1)

(g) Proteins are first digested chemically in the

- A stomach
- B small intestine
- C large intestine
- D anus

(1)

(h) Human activities may contribute to greenhouse gases. Below is a list of gases.

**methane**  
**carbon dioxide**  
**oxygen**  
**CFCs**

How many of these gases are greenhouse gases?

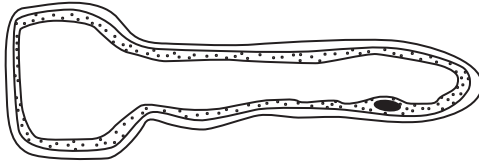
- A 1
- B 2
- C 3
- D 4

(1)



Leave blank

(i) This is a diagram of a root hair cell.

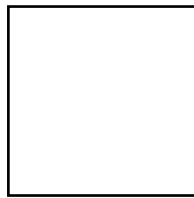


Which row in the table is correct?

	Where found	Function	
<b>A</b>	animal	absorb water	<input type="checkbox"/>
<b>B</b>	plant	absorb water	<input checked="" type="checkbox"/>
<b>C</b>	animal	absorb oxygen	<input type="checkbox"/>
<b>D</b>	fungus	absorb oxygen	<input type="checkbox"/>

(1)

(j) The diagram shows a quadrat. Each side is 0.5 m.



The area inside the quadrat is

- A** 0.025 m<sup>2</sup>
- B** 0.25 m<sup>2</sup>
- C** 2.0 m<sup>2</sup>
- D** 2.5 m<sup>2</sup>

(1)

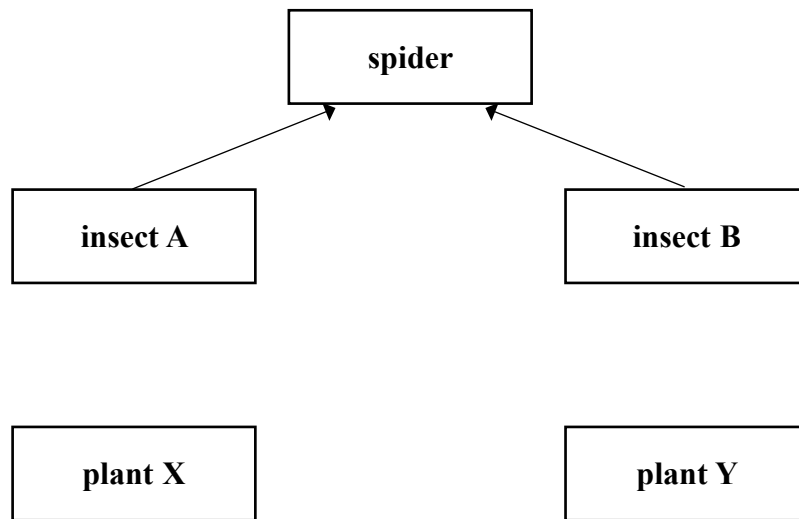
Q1

(Total 10 marks)



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2. The diagram shows a food web where only some of the arrows have been drawn.



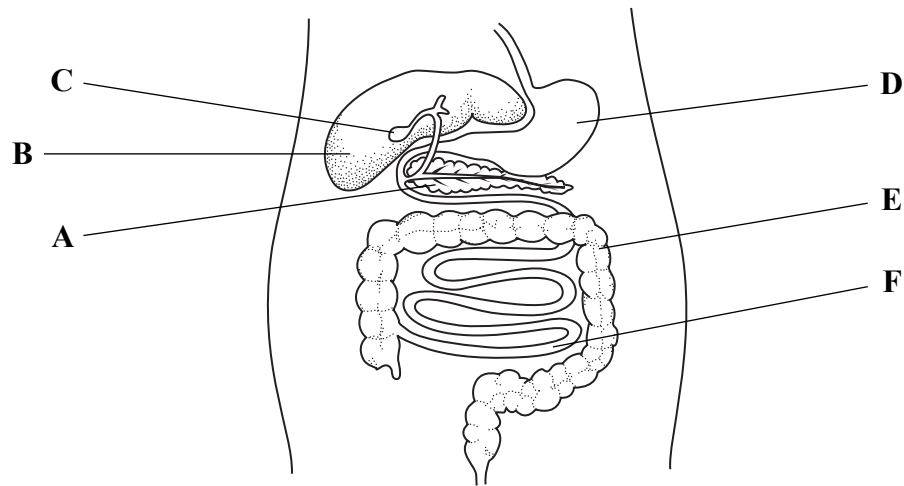
- (a) Complete the food web by drawing arrows on the diagram to show that
- (i) insect **A** eats both plant **X** and plant **Y**
  - (ii) insect **B** eats only plant **Y**.
- (2)
- (b) A disease killed all of plant **X**. How would this affect the numbers of plant **Y**?
- .....
- (1)
- (c) Name a primary consumer in the food web.
- .....
- (1)
- (d) Give the energy source for plants **X** and **Y**.
- .....
- (1)

Q2

(Total 5 marks)



3. The diagram shows part of the human digestive system and some other organs.



(a) (i) Which letter shows the stomach?

..... (1)

(ii) Which letter shows the small intestine?

..... (1)

(iii) Which letter shows where water is absorbed from the faeces?

..... (1)

(iv) Part C is the gall bladder. What is its function?

..... (1)

(b) Food is broken down in the digestive system.

Some products of digestion are shown below.

**amino acid      glucose      fatty acid**

Which is a product of lipid digestion?

..... (1)

(Total 5 marks)

Q3



Leave blank

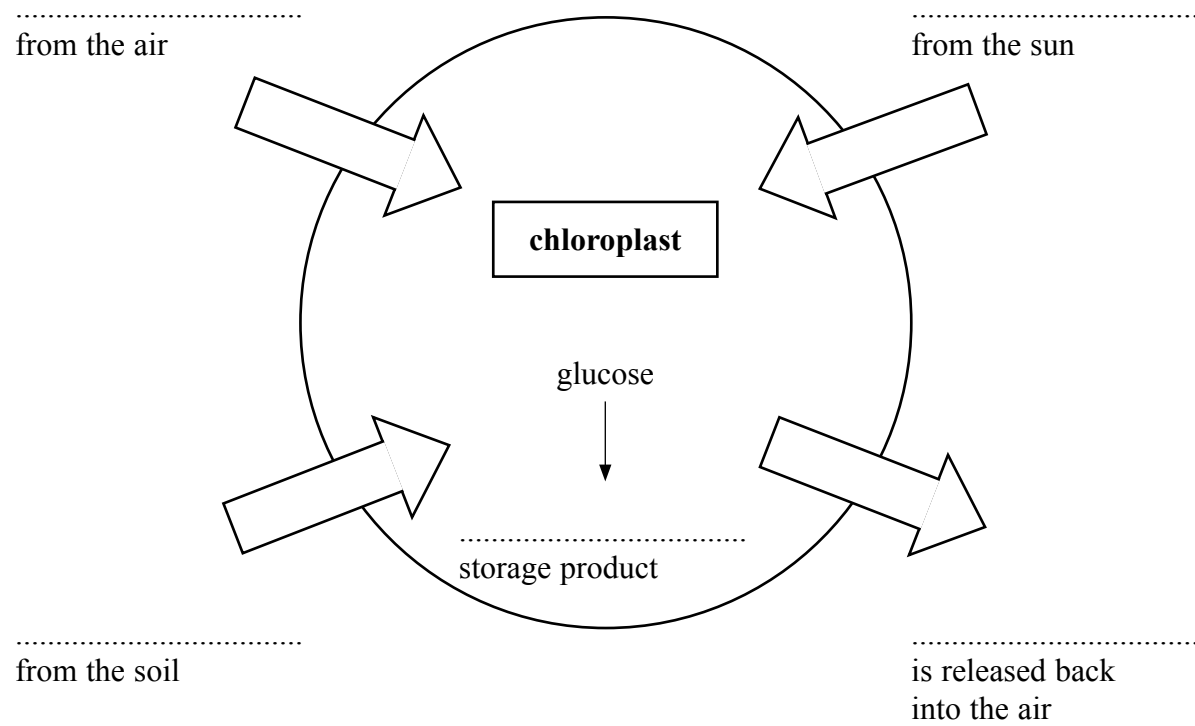
4. Photosynthesis is the process by which plants make glucose.

This process happens in chloroplasts.

The diagram shows what happens in a chloroplast.

Choose the correct words or phrases from the list to complete the diagram.

- |                       |                     |                                |
|-----------------------|---------------------|--------------------------------|
| <b>carbon dioxide</b> | <b>cellulose</b>    | <b>electrical energy</b>       |
| <b>glycogen</b>       | <b>light energy</b> | <b>methane</b> <b>nitrogen</b> |
| <b>oxygen</b>         | <b>starch</b>       | <b>water</b>                   |



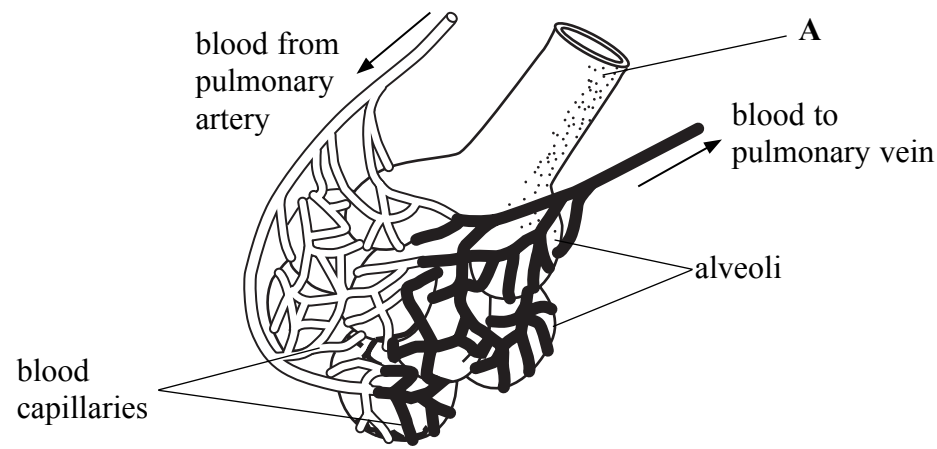
Q4

(Total 5 marks)





5. Alveoli (air sacs) are important for gas exchange in the lungs. The diagram shows some alveoli.



(a) Choose a word from the list below to name the tube labelled A.

- bronchiole      larynx      mouth      nose      trachea**

..... (1)

(b) Name the organ that receives blood from the pulmonary vein.

..... (1)

(c) A gas diffuses from the alveoli into the blood capillaries. This gas is used in respiration.

Complete the word equation for respiration.

..... + ..... → carbon dioxide + ..... + energy (3)

(d) Describe how alveoli are adapted for gas exchange.

.....  
.....  
.....  
..... (2)

(Total 7 marks)

Q5



6. Modern wheat has desired characteristics. It has been developed over many years from strains of wheat that were not ideal.

(a) What is the name of the process that humans have used to develop wheat with desired characteristics?

..... (1)

(b) The diagram shows two strains of wheat with different characteristics.



**strain A:**  
weak long stem, high yield



**strain B:**  
strong short stem, low yield

Name the desired characteristics of wheat shown by **strain A** and **strain B**.

..... (1)



Leave  
blank

(c) A wheat plant that has desired characteristics may be reproduced by tissue culture (micropropagation).

(i) Describe the process of micropropagation.

.....  
.....  
.....  
.....  
.....

(2)

(ii) Give **two** advantages of producing plants by micropropagation.

1 .....

.....

2 .....

.....

(2)

(iii) Give **one** disadvantage of producing plants by micropropagation.

.....  
.....

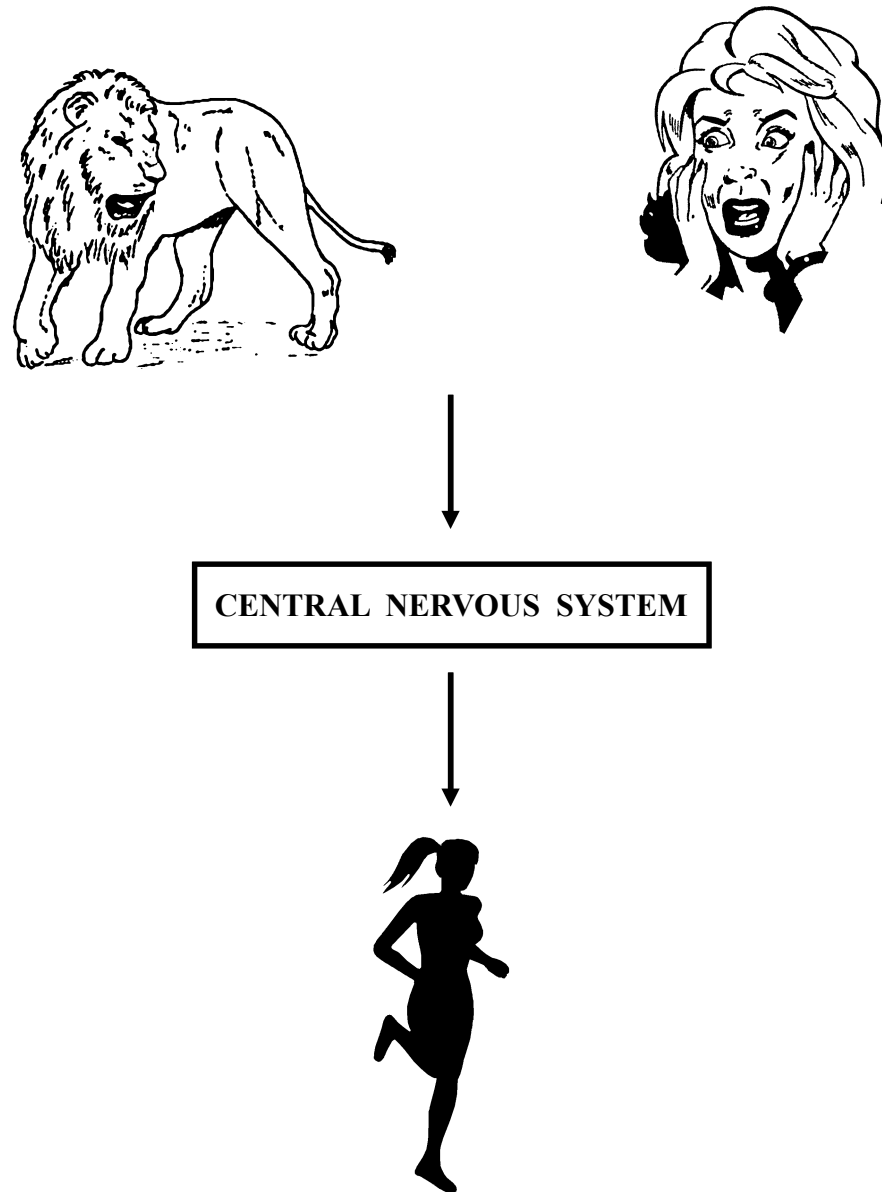
(1)

(Total 7 marks)

Q6



7. The diagram shows what happens when Emy sees a lion and runs away.



(a) What type of cell do the arrows in the diagram represent?

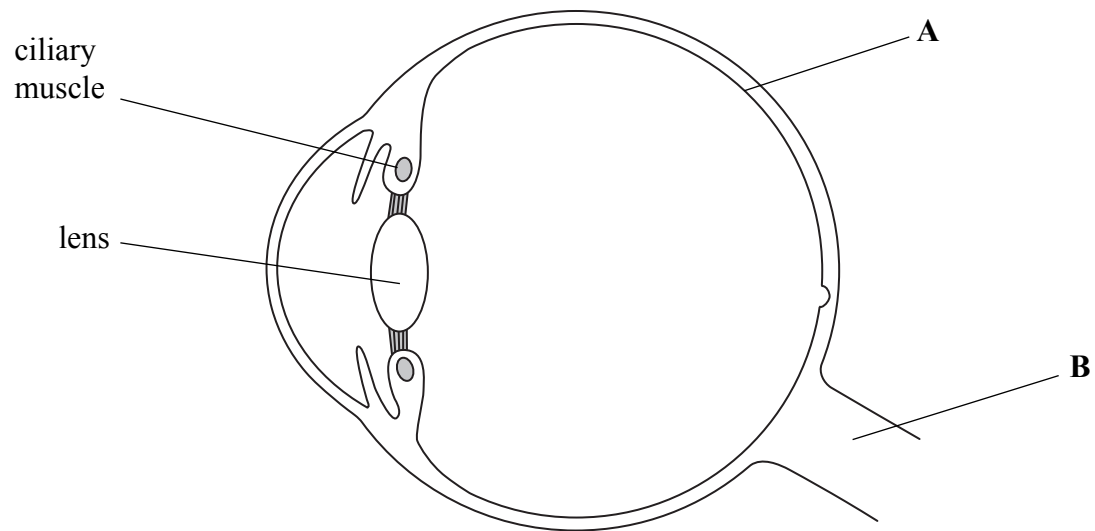
..... (1)

(b) The central nervous system is made of two main parts. One part is the spinal cord. Name the other part.

..... (1)



(c) The diagram shows a section through one of Emy's eyes.



(i) Name the parts labelled **A** and **B**.

**A** .....

**B** .....

(2)

(ii) Emy's eyes stay focused on the lion as it gets closer to her.

Describe what happens to the ciliary muscles and lens so that Emy continues to see the lion clearly as it moves closer.

ciliary muscle .....

.....

lens .....

.....

(2)

(d) Emy's heart beats very fast when she sees the lion.

Which hormone helps to increase her heart rate?

.....

(1)

Q7

(Total 7 marks)



8. Some people with diabetes need daily injections of a hormone called insulin.

Complete the sentences below.

Insulin is made in the body in an organ called the .....

Insulin is important because it lowers the levels of ..... in the blood.

A large amount of insulin is made from genetically modified microorganisms called ..... The microorganisms are grown in a large container called a .....

**(Total 4 marks)**

Leave  
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**Q8**



Leave blank

9. The list gives five different types of living organism.

**plants      animals      fungi      bacteria      viruses**

The table lists features of living organisms.

Complete the table by writing the correct type of living organism that has the feature.

The first one has been done for you.

Feature	Type of living organism
have cellulose cell walls	plants
all are parasitic and have a protein coat	
are microscopic and contain circular DNA	
some have structures called hyphae	
cells have a nucleus but no cell wall	

Q9

(Total 4 marks)



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10. The photograph shows a field of sunflowers.



Sunflowers are large insect-pollinated plants.  
The flowers turn to face the sun as it moves across the sky during the day.

(a) Describe what is meant by the term 'insect pollination'.

.....  
.....  
.....  
.....

(2)



Leave  
blank

(b) (i) Sunflowers respond to the stimulus of the sun.

Put a cross (☒) in the box next to the name of this response.

A positive phototropism

B negative phototropism

C positive geotropism

D negative geotropism

(1)

(ii) Suggest an advantage of the flowers turning to follow the sun as it moves across the sky during the day.

.....

.....

.....

.....

(2)



Leave blank

(c) Plant stems and roots also respond to stimuli.

Describe the responses of plant stems and roots to gravity and suggest why these responses are important.

Stems .....

.....

.....

.....

.....

Roots .....

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.....

.....

.....

(4)

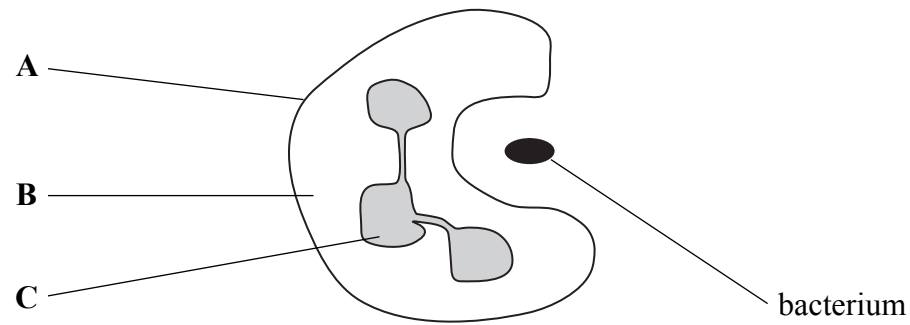
Q10

(Total 9 marks)



**11.** White blood cells help to prevent disease.

The diagram shows one type of white blood cell ingesting a bacterium.



- (a) (i) Complete the table to give the names and functions of the parts of the cell labelled **A**, **B** and **C**.

Part of cell	Name of part of cell	Function of part of cell
<b>A</b>		
<b>B</b>		
<b>C</b>		

(4)

- (ii) Describe what happens to the bacterium after it has been ingested.

.....

.....

.....

.....

(2)



(b) Describe how a different type of white blood cell can also help to prevent disease.

.....  
.....  
.....  
.....

(2)

(Total 8 marks)

Leave  
blank

Q11



N 3 6 8 6 0 A 0 2 1 2 8

Leave blank

12. The table lists the names of some human conditions and their symptoms.

Complete the table by writing the name of the organ affected in each empty box.

One has been done for you.

Condition	Symptom	Organ affected
emphysema	poor gas exchange	
cataract	cloudy lens	
Alzheimer's	loss of memory	
coeliac	poor food absorption	
arthritis	swollen joints	bones
infertility	lack of sperm	

Q12

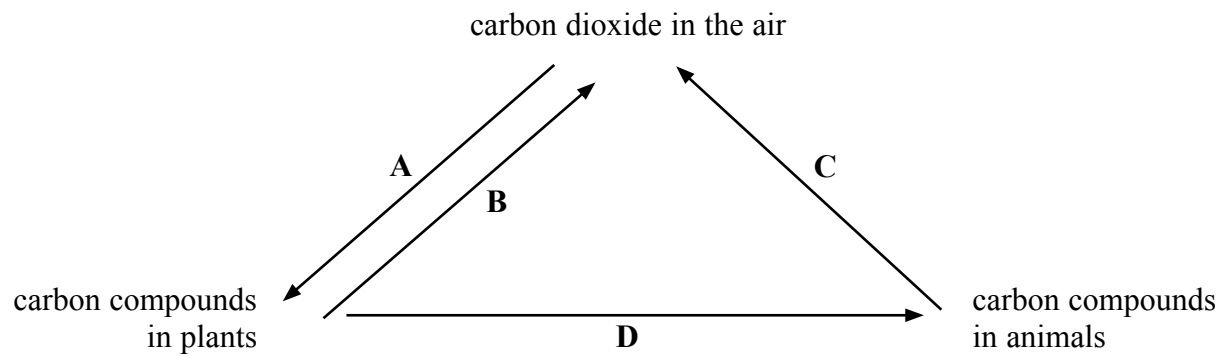
(Total 5 marks)



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13. The diagram shows the carbon cycle.



(a) (i) Which letter represents photosynthesis?

..... (1)

(ii) Arrow C could represent two processes.

Name these **two** processes.

1 .....

2 .....

(2)

(b) Human activities can increase the carbon dioxide in the air.

Describe the possible consequences of too much carbon dioxide in the air.

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.....  
.....

(5)

Q13

(Total 8 marks)





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14. A farmer had a field of maize.

(a) He found weeds growing amongst the maize plants.

(i) Explain how the weeds could reduce the yield of maize.

.....  
.....  
.....  
.....

(2)

(ii) Describe **one** way in which the farmer could get rid of the weeds.

.....  
.....

(1)

(b) The farmer also found insects feeding on the leaves of the maize plants.

(i) Explain how the insects could reduce the yield of maize.

.....  
.....  
.....  
.....

(2)

(ii) Name **two** ways in which the farmer could get rid of the insects feeding on the maize.

1 .....

2 .....

(2)

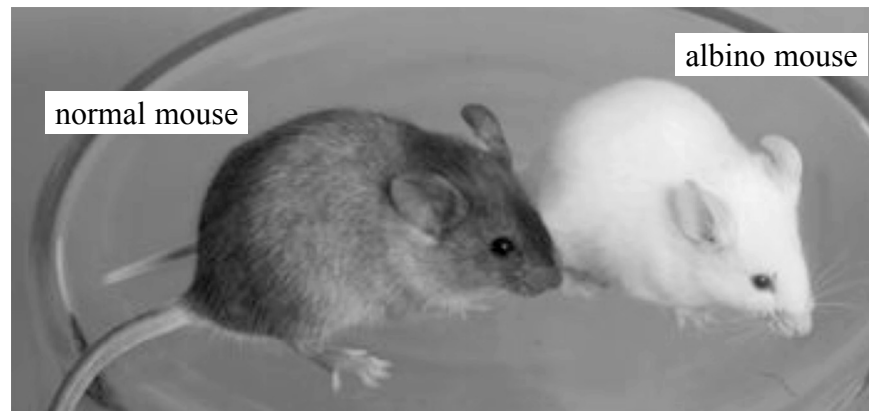
(Total 7 marks)

Q14



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15. The photograph shows a normal mouse and an albino mouse.



Albinism is an inherited condition in which animals have white fur.

Albinism is controlled by a single gene that has two alleles.

The allele for albinism, **a**, is recessive. The dominant allele, **A**, produces brown fur.

Two mice with brown fur were mated.

They produced some offspring with brown fur and some offspring with white fur.

(a) Draw a genetic diagram to show the genotypes of the parents, their gametes, and the genotypes and phenotypes of their offspring.

(4)



(b) Albino mice are often kept as pets because people like their white fur.

(i) Some genotypes of parent mice are more useful than others in producing albino offspring.

The table describes different parent genotypes and the number of albino mice that would be expected if the parents produced four offspring.

Complete the table.

Parent genotypes	Number of albino offspring
homozygous dominant × homozygous dominant	none
heterozygous × homozygous recessive	
heterozygous × heterozygous	
homozygous recessive × homozygous recessive	

(3)

(ii) Suggest why mice with white fur are rarely found in the wild.

.....

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.....

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.....

.....

.....

.....

(2)

Q15

(Total 9 marks)

**TOTAL FOR PAPER: 100 MARKS**

**END**



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