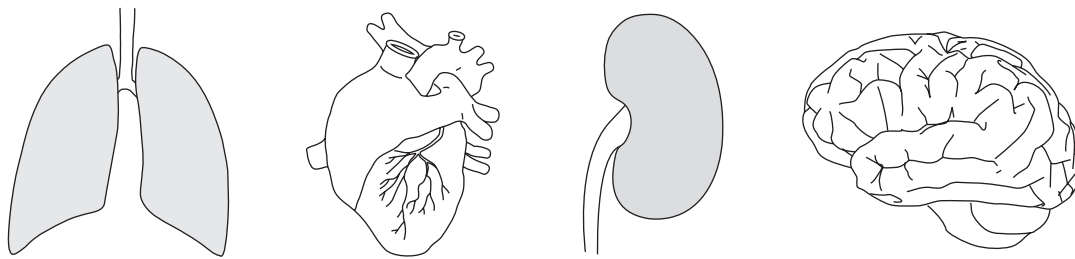




Answer ALL the questions. Write your answers in the spaces provided.

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

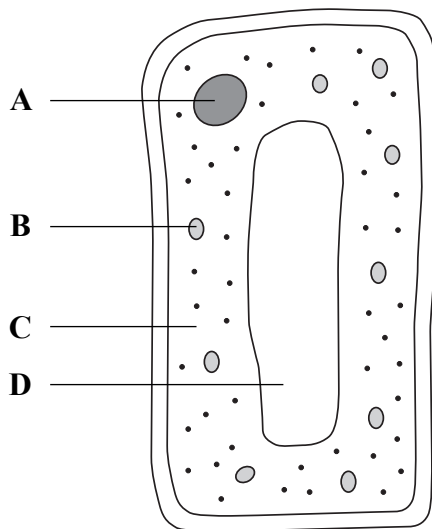
(a) The diagrams show organs found in the human body. Which organ is used to pump blood round the body? Put a cross (☒) in the correct box.



- A lung
- B heart
- C kidney
- D brain

(1)

(b) The diagram shows a cell found in a plant leaf.



Which part of the cell is a chloroplast? Put a cross (☒) in the correct box.

- A
- B
- C
- D

(1)



Leave  
blank

(c) Which of the following is needed for aerobic respiration? Put a cross (☒) in the correct box.

A oxygen

B carbon dioxide

C energy

D lactic acid

(1)

(d) Which statement gives the best description of transpiration? Put a cross (☒) in the correct box.

A loss of water from an animal

B loss of water from a plant

C absorption of water by an animal

D absorption of water by a plant

(1)

(e) The table lists some hormones, and where they are made. Which row is correct? Put a cross (☒) in the correct box.

	made in testis	made in ovary
A <input type="checkbox"/>	testosterone	testosterone
B <input type="checkbox"/>	progesterone	oestrogen
C <input type="checkbox"/>	oestrogen	testosterone
D <input type="checkbox"/>	testosterone	oestrogen

(1)

(f) Which term describes the growth of a plant stem towards light? Put a cross (☒) in the correct box.

A positive geotropism

B negative geotropism

C positive phototropism

D negative phototropism

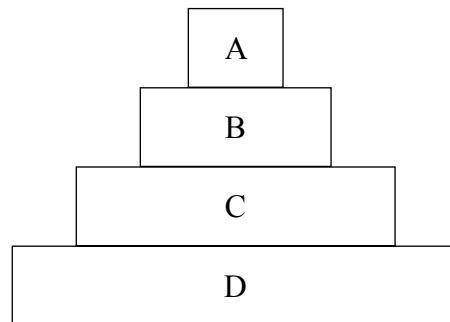
(1)



M 3 2 2 0 8 A 0 3 2 8

Leave  
blank

(g) The diagram shows a pyramid of numbers.



Which level of the pyramid represents tertiary consumers? Put a cross (☒) in the correct box.

- A
- B
- C
- D

(1)

(h) Which statement is correct? Put a cross (☒) in the correct box.

- A cells are found inside organelles
- B organelles are found inside cells
- C tissues are made from organs
- D cells are made from tissues

(1)



Leave blank

(i) The table lists some organs.

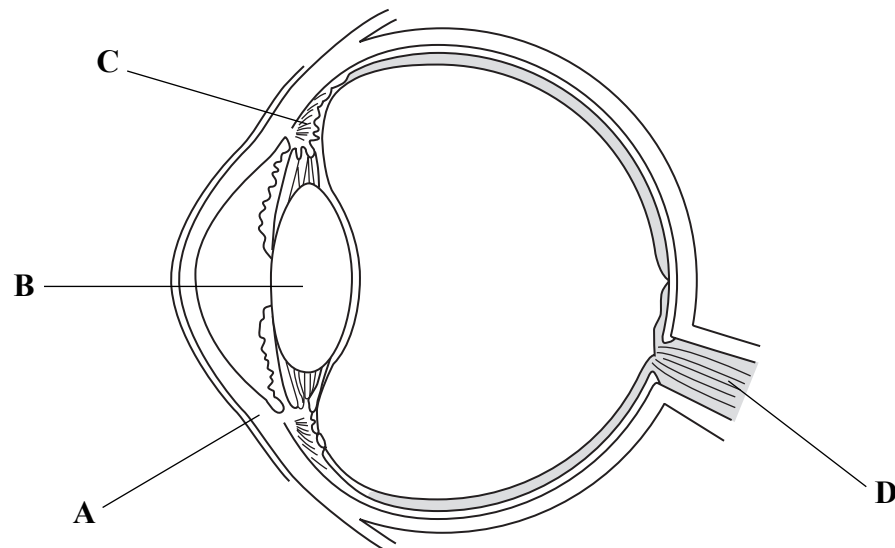
lung
leaf
placenta
flower

How many of the organs are used for gas exchange in humans? Put a cross (☒) in the correct box.

- A one
- B two
- C three
- D four

(1)

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



Which part is made from nerve cells? Put a cross (☒) in the correct box.

- A
- B
- C
- D

(1)

Q1

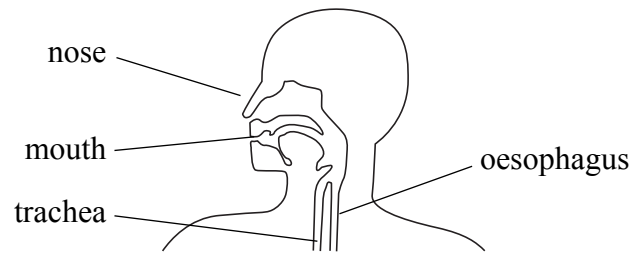
(Total 10 marks)



M 3 2 2 0 8 A 0 5 2 8

Leave blank

2. The diagram shows a section of the human head and neck.



(a) (i) Air passes into the trachea. Name **two** gases found in the air in the trachea.

1 .....

2 .....

(2)

(ii) Air passes from the trachea to the lungs.

Choose **two** words from the box to complete the pathway below.

alveolus	bronchus	mouth	stomach
----------	----------	-------	---------

nose → trachea → ..... → bronchiole → ..... (2)

(b) (i) Food passes into the oesophagus when it is swallowed.  
How is this food moved along the oesophagus?

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

(2)

(ii) Name the part of the gut that food passes into from the oesophagus.

.....

(1)

Q2

(Total 7 marks)



Leave  
blank

3. Excretion is the removal of harmful substances from the cells of the body.

Five organs involved in excretion in humans are listed below.

**bladder   kidney   liver   lung   skin**

Complete the table by writing the name of the correct organ next to its function.

Function of organ	Name of organ
Removes carbon dioxide from the body	
Stores urine	
Removes urea from blood	
Releases sweat from the body	

Q3

(Total 4 marks)

7

Turn over

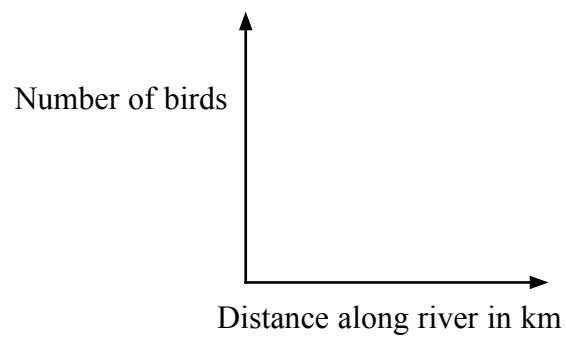


4. A species of bird is known to feed on insects found in river water.

A study was made into the numbers of this bird seen at different locations along a particular river. The pH of the river water was also measured. The results are shown in the table.

Distance along river in km	Number of birds seen	pH of river water
5	2	6.0
15	8	7.0
25	10	7.2
35	14	7.6
45	16	8.0

(a) Draw a line on the graph below to show how the number of birds changes at different distances along the river.



(1)

(b) (i) What is the relationship between the pH of the river water and the number of birds?

.....  
 .....

(1)

(ii) The birds feed on insects that live in the river water. Use this information to suggest how pH affects the number of insects in the river water. Give a reason for your answer.

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

(2)





(c) Pollution by acid rain can lead to changes in the pH of river water.  
Name **one** acidic gas responsible for causing acid rain pollution.

.....

(1)

(Total 5 marks)

Leave  
blank

Q4



M 3 2 2 0 8 A 0 9 2 8

5. The diagram shows weeds growing among crops in a field.



A farmer was worried the weeds might reduce the yield of his crop by competing for light.

(a) Suggest how competition for light would reduce the yield of the crop.

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

(2)

(b) The weed and the crop would also compete for substances found in the soil. Name **two** of these substances.

1 .....

2 .....

(2)



(c) To find out if weeds did reduce the yield of his crop, the farmer decided to test the effect of spraying parts of the crop with herbicide. A herbicide is a chemical that kills weeds.

He divided his field into several plots of equal size. He sprayed half the plots with herbicide. The other plots were not sprayed with herbicide. He waited two weeks and then measured the yield of crop in the different plots.

The table shows the results.

Yield of crop in tonnes per hectare	
Plots sprayed with herbicide	Plots not sprayed with herbicide
0.31	0.09
0.27	0.10
0.33	0.11
0.33	0.07
0.31	0.08
<b>Average yield per plot = ?</b>	<b>Average yield per plot = 0.09</b>

(i) How many plots did the farmer use in total?

.....  
(1)

(ii) Calculate the average yield from the plots sprayed with herbicide. Show your working.

Answer ..... tonnes per hectare  
(2)

(iii) What conclusion did the farmer make when he looked at the results?

.....  
.....  
(1)

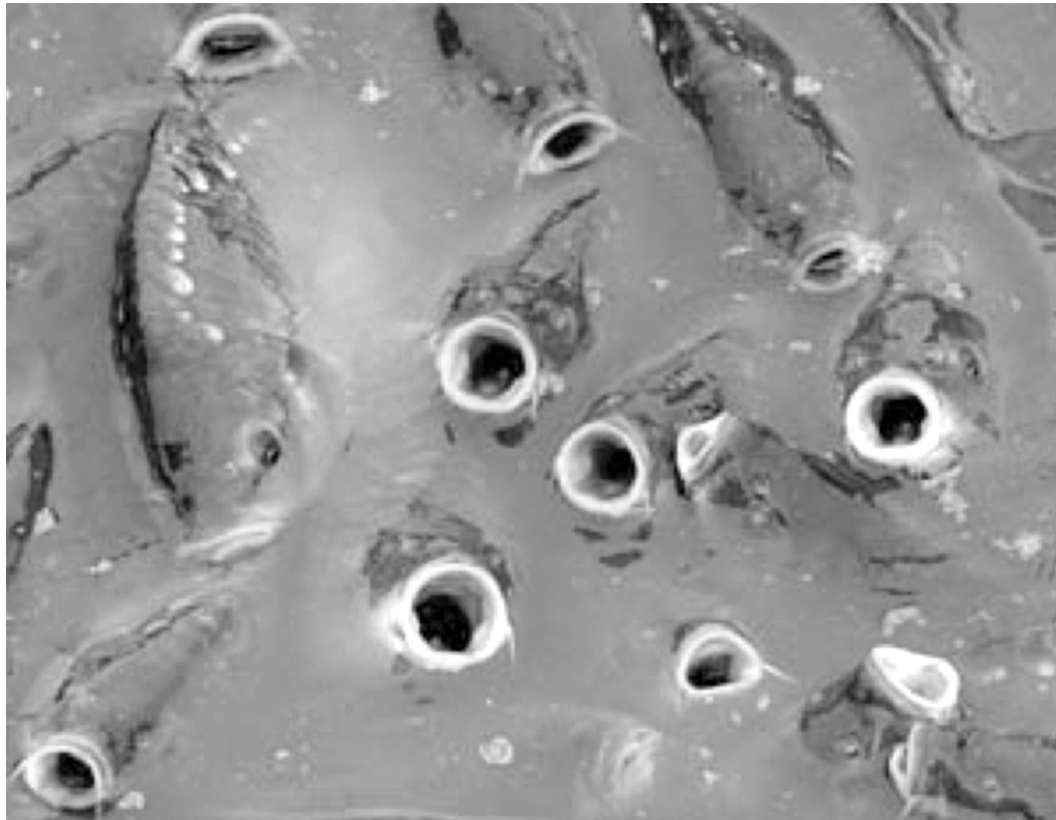
(Total 8 marks)

Q5



Leave  
blank

6. The photograph shows some fish in polluted water. The fish are gasping for air.



It was thought that the water had been polluted by sewage.  
Use this information to complete the passage below.

Sewage contains faeces and urine. The sewage is broken down by microorganisms  
such as ..... and .....

The number of these microorganisms ..... and this reduces the  
amount of ..... gas in the water.

Microorganisms use this gas to help them release energy. Lack of this gas will cause  
the fish to .....

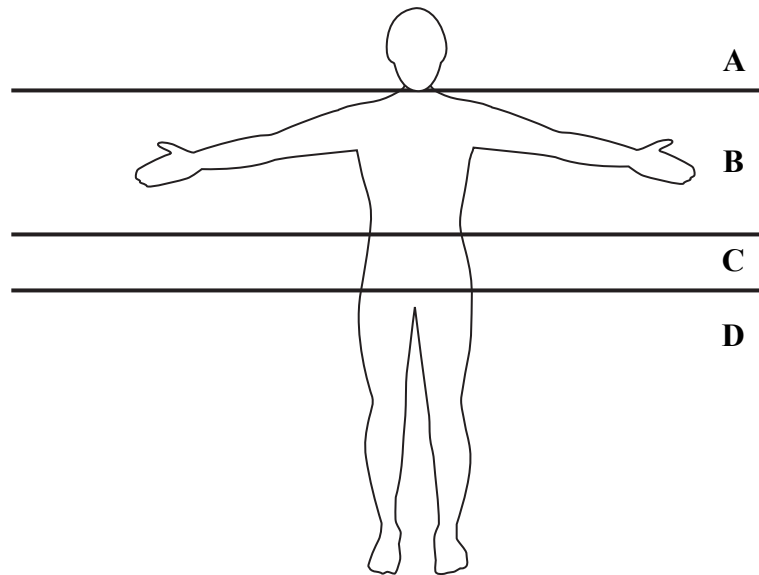
Q6

(Total 5 marks)



Leave  
blank

7. Smoking cigarettes is known to cause cancer in many parts of the body. The diagram shows an outline of a human body marked into four sections **A**, **B**, **C** and **D**.



- (a) Each of the body parts listed below can be harmed by cancer. Complete the table to show where the part can be found. The first one has been done for you.

Body part harmed by cancer	Section
Pancreas	B
Mouth	
Bladder	
Stomach	
Lung	
Testis	

(5)



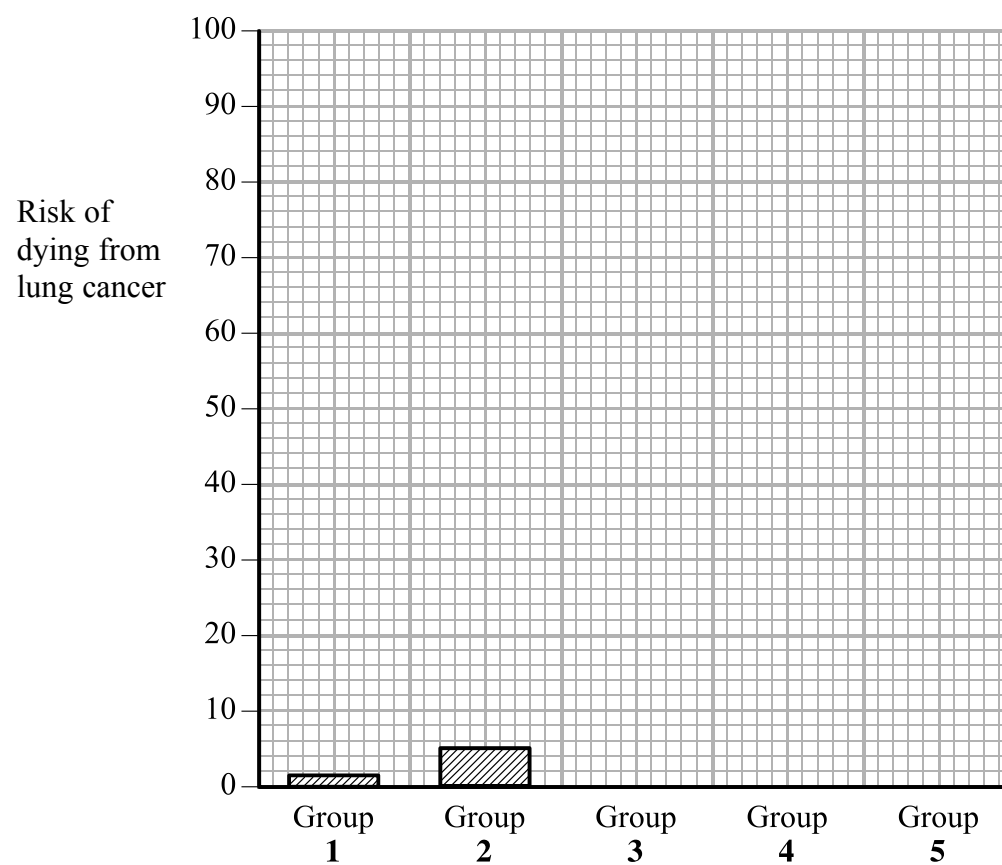
Leave blank

(b) Working with asbestos is also known to cause lung cancer. The table shows the risk of dying from lung cancer in five different groups of people. The higher the number the greater the risk.

Group	Risk of dying from lung cancer
1 non-smokers who do not work with asbestos	1
2 non-smokers who work with asbestos	5
3 light smokers who do not work with asbestos	10
4 light smokers who work with asbestos	52
5 heavy smokers who work with asbestos	88

Note: A 'light' smoker smokes fewer than 20 cigarettes a day.  
A 'heavy' smoker smokes more than 20 cigarettes a day.

(i) Use the information from the table to complete the bar graph below.  
The bars for Group 1 and Group 2 have been done for you.



(2)





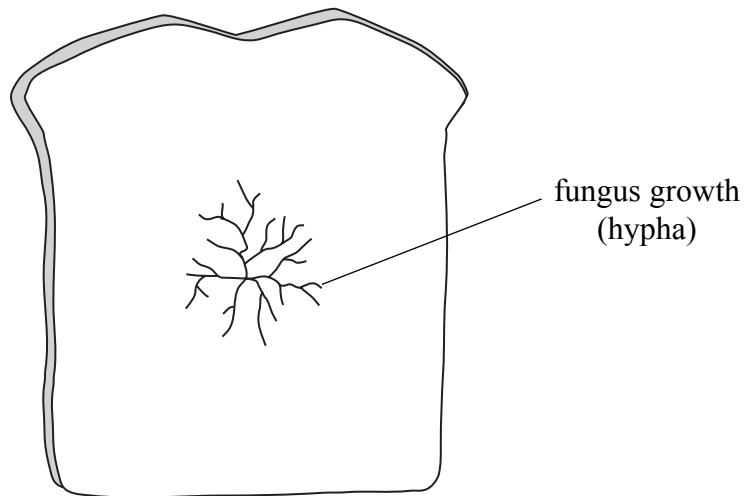
<p>(ii) Which group of people has the least risk of dying from lung cancer?</p> <p>.....</p> <p>(1)</p> <p>(iii) How does working with asbestos affect the risk of a non-smoker dying from lung cancer?</p> <p>.....</p> <p>(2)</p> <p>(iv) What information in the table supports the claim that smoking increases the risk of getting lung cancer?</p> <p>.....</p> <p>.....</p> <p>(1)</p> <p>(Total 11 marks)</p>	<p>Leave blank</p> <p>Q7</p>
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M 3 2 2 0 8 A 0 1 5 2 8

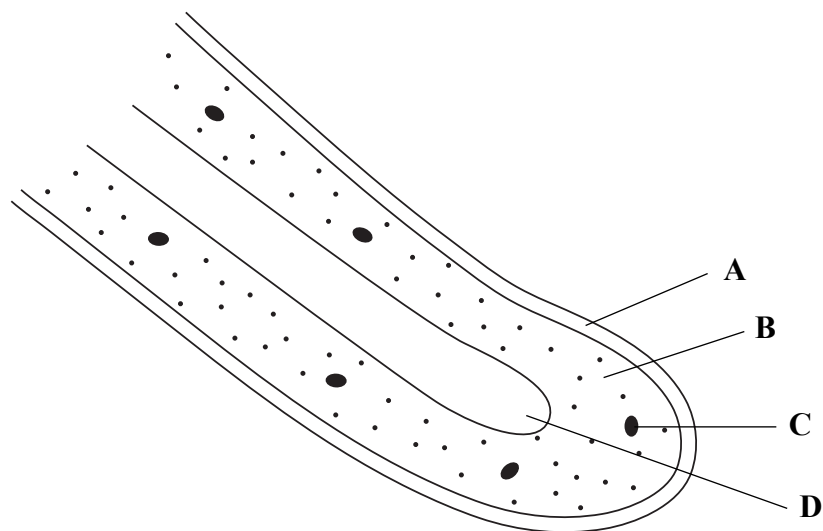


8. The drawing shows a piece of bread. The bread is going mouldy because a fungus is growing and feeding on it. When the fungus grows it produces many threads (hyphae) that spread over the bread.



The hyphae secrete enzymes that digest the bread. The products from this digestion are then absorbed by the fungus.

- (a) The diagram shows a magnified view of a single hypha from the fungus.



- (i) Name the parts labelled A, B, C and D.

A .....

B .....

C .....

D .....

(4)





Leave blank

(ii) Complete the table to name the type of enzyme secreted by the fungus and the products of digestion.

Name of enzyme secreted by fungus	Product of digestion
	maltose
protease	
	fatty acids and glycerol

(3)

(b) The passage below describes the part played by fungi in the carbon cycle. Complete the passage by choosing a suitable word or words to write on the dotted lines.

Many fungi are decomposers and play an important part in the carbon cycle.

Decomposition is the .....

of dead organisms, or other organic material, such as bread. The process releases

inorganic mineral ions, such as .....

into the soil. Decomposition also releases a gas called

..... into the air. This gas is

produced by a process called .....

which releases the energy that fungi need to grow. The same gas is taken

out of the air by plants and used in a process called

..... to make food.

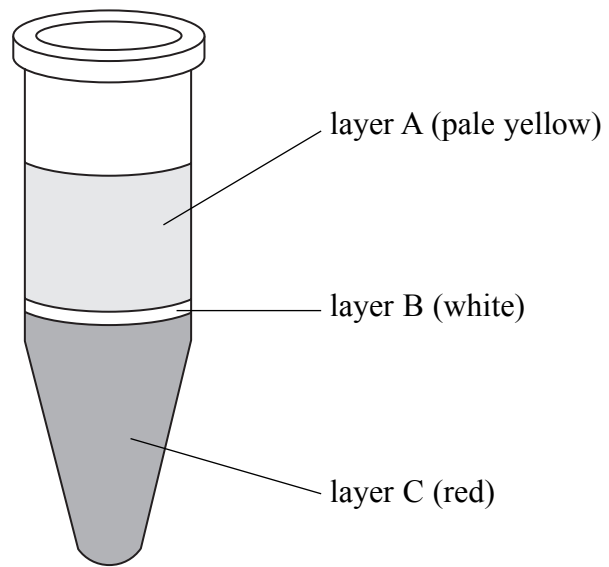
(5)

Q8

(Total 12 marks)



9. A sample of blood was taken from a healthy adult. The blood was placed in a tube in a machine called a centrifuge. A centrifuge spins the tube around very fast and after a time the blood separates into different layers. When the tube of blood was taken out of the centrifuge it looked like this.



(a) (i) Name the pale yellow liquid found in layer A.

..... (1)

(ii) Give **one** function of this liquid.

.....  
..... (1)



Leave blank

(b) Layer B contains cells. These cells are involved in protecting the body from infection.

(i) Name the cells in layer B.

.....  
(1)

(ii) Describe how these cells protect the body from infection.

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

(c) Name the cells found in layer C.

.....  
(1)

(d) Explain why a person who loses a lot of blood quickly could die.

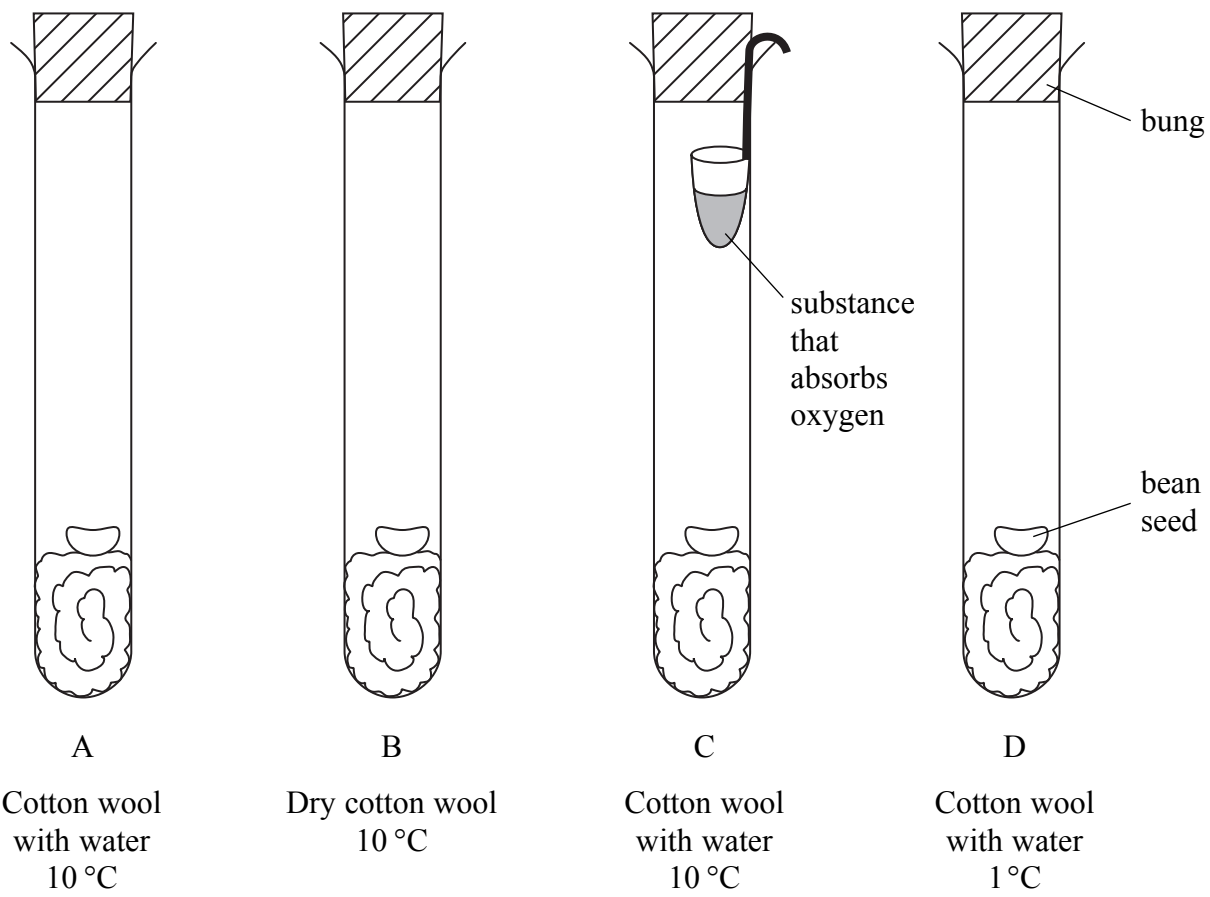
.....  
.....  
.....  
.....  
(2)

(Total 8 marks)

Q9



10. Adam wanted to investigate the conditions required for bean seeds to germinate. He set up four boiling tubes with bean seeds as shown in the diagram.



(a) In which tube would you expect the bean seed to germinate? Explain your answer.

Tube .....

Explanation .....

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

(4)



Leave  
blank

(b) In bean seeds, the food store contains an insoluble carbohydrate.  
The seedling uses the food store for growth.

(i) Name the large insoluble carbohydrate molecule found in the food store.

.....  
(1)

(ii) Explain how the seedling uses this carbohydrate as it grows.

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

Q10

(Total 7 marks)



Leave blank

**11.** A farmer noticed that small insects called aphids were feeding on the leaves of his tomato plants. The farmer knew that ladybirds eat aphids, so he released lots of ladybirds onto his tomato plants.

(a) (i) Use this information to draw a food chain in the space below.

(2)

(ii) Suggest how the aphids would affect the yield of tomatoes.

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

(2)

(iii) The farmer released ladybirds to reduce the number of aphids.  
What name is given to this method of reducing the numbers of an insect pest?

.....

(1)

(b) The farmer could also use pesticides to reduce the numbers of an insect pest.  
Describe the disadvantages of using pesticides compared to using ladybirds.

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

(3)

(Total 8 marks)

Q11



Leave blank

12. The photograph shows a dog called Snuppy. Snuppy was the first dog to be produced by cloning. He was cloned using cells from the skin of his father.



Describe the stages that might have been used to produce Snuppy.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Q12

(Total 5 marks)



Leave  
blank

**13.** Huntington's disorder affects the nervous system. It is controlled by a single gene that has two alleles. If a person has the dominant allele **H**, they develop the condition, but usually it does not show until later in life. If a person is homozygous recessive they do not develop the condition, and are described as being 'normal'.

(a) Explain what is meant by the term **homozygous recessive**.

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

**(2)**

(b) Dick and Janet married and had children. Genetic tests later revealed that Dick was homozygous recessive for this condition but Janet was heterozygous. In the space below draw a genetic diagram to show their genotypes, the possible gametes, and the genotypes and phenotypes of their children.

Dick

Janet

Genotype

Gametes

Genotypes of children

Phenotypes of children

**(4)**





Leave  
blank

(c) Huntington's disorder affects the functioning of the nervous system.

(i) Name the **two** main parts of the central nervous system.

1 .....

2 .....

(2)

(ii) Describe how information from receptors in the nervous system is passed to the central nervous system.

.....

.....

.....

.....

(2)

Q13

(Total 10 marks)

**TOTAL FOR PAPER: 100 MARKS**

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