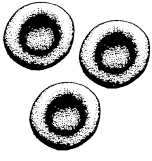
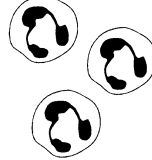



1. (a) The table below shows diagrams of different types of blood components.

Complete the table by naming the type of component and stating **one** function. One box has been completed for you.

Diagram of component	Name of component	One function
		
		
	Platelets	

(5)

(b) Red blood cells have special features that help them to carry out their function.

State **two** of these features and explain how each helps the red cells to carry out their function.

1

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2

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(4)

Q1

(Total 9 marks)



Leave
blank

2. The passage below is about water pollution. Complete the passage by writing a suitable word or words in each space.

Eutrophication may occur when mineral ions, such as,
are from the soil into rivers. These mineral ions cause
excess of microscopic organisms, including algae.
These microscopic organisms absorb light and stop it reaching the larger plants in the
river. These plants cannot carry out and therefore die.
The dead plants are decomposed by and this process
uses up dissolved in the river water. As a result,
larger animals such as also die.

(Total 7 marks)

Q2

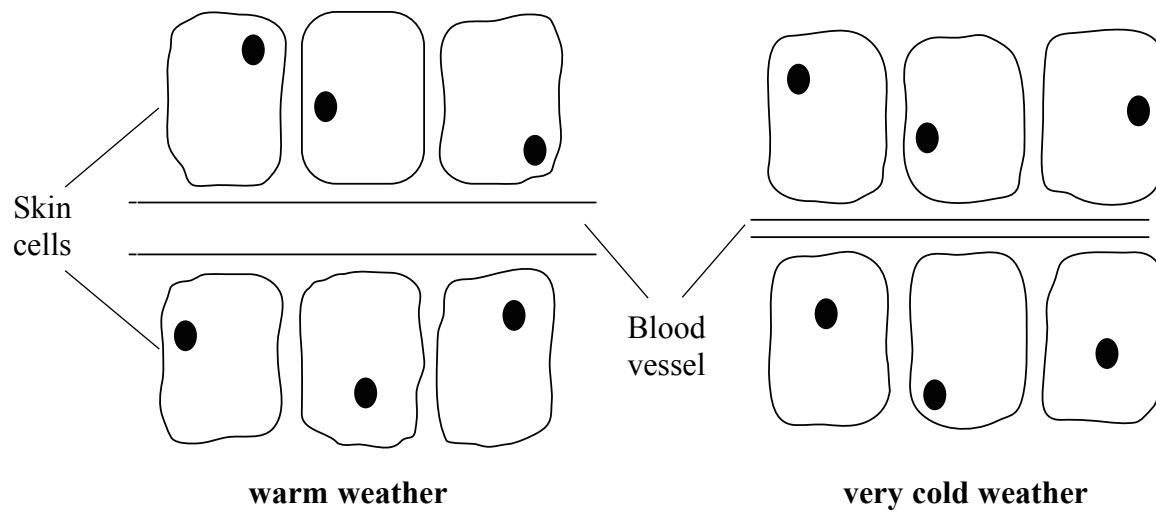
3

Turn over



3. In very cold weather, the fluid surrounding cells in the body may freeze. This would lead to frostbite and death of the cells. In these conditions, the circulation of blood to the extremities, such as the feet and hands, is reduced and this acts as a way of protecting internal organs.

The diagram below shows a blood vessel supplying a group of skin cells in warm weather and in very cold weather.



(a) (i) What evidence in the diagram suggests that less blood flows to skin cells in cold weather?

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(1)

(ii) Why is it an advantage that less blood flows to skin cells in cold weather?

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(2)



Leave blank

(b) (i) In cold weather the skin cells need to continue to respire in order to stay alive. Name **two** substances in blood that skin cells need for respiration.

1

2

(2)

(ii) Suggest why, when frostbite occurs, these substances may not pass from the blood to skin cells.

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(2)

Q3

(Total 7 marks)



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4. The table below lists several processes that are characteristic of living organisms. Complete the table by giving a description of the process and describing a suitable example of the process being carried out.

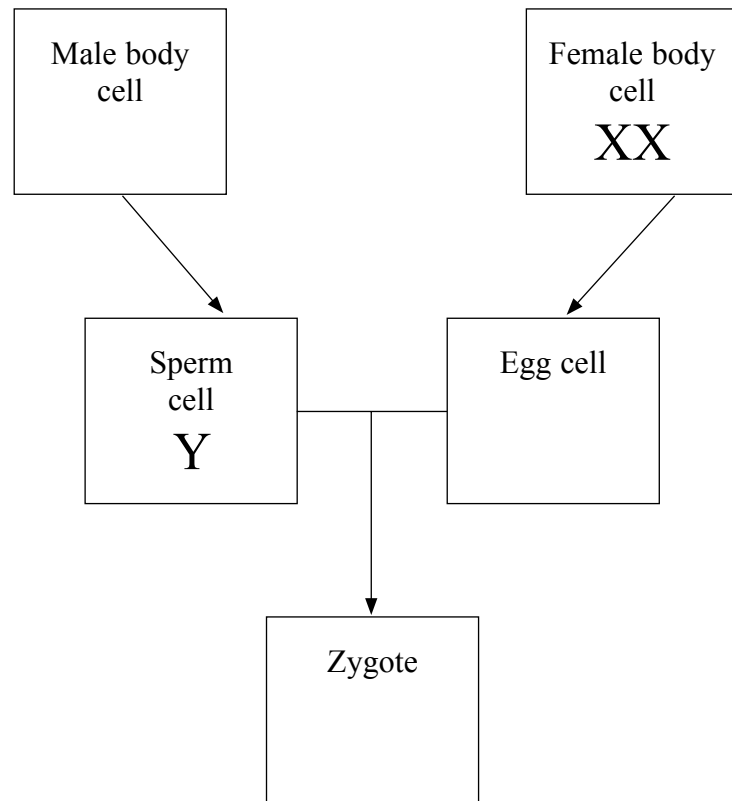
Characteristic	Description of process	Example of process being carried out
Growth		Mitosis occurs in cells
Nutrition		Starch is produced in photosynthesis
Response	An organism reacts to an external stimulus	
Control	An organism can control its internal conditions	
Excretion		
Reproduction		Fertilisation in plants leads to seed formation

Q4

(Total 7 marks)



5. The diagram below shows the cells involved in producing a human zygote. The sex chromosomes have been put into some of the cells.



(a) Complete the diagram by putting the correct sex chromosomes into the boxes for the male body cell, the egg cell and the zygote. (3)

(b) Name the organ in the male that produces sperm cells.
 (1)

(c) Name the organ in the female that produces egg cells.
 (1)

(d) What term is used to describe the joining of a sperm cell and an egg cell?
 (1)

(Total 6 marks)

Q5



6. Cylinders, cut from a potato, change mass when placed in solutions each of a different concentration.

A student weighed four potato cylinders. He placed one cylinder in distilled water and the other three in solutions of sodium chloride. After one hour he weighed them again. His results are shown in the table below.

Solution	Original mass in g	Final mass in g	Change in mass (%)
Distilled water	2.80	2.87	?
1% sodium chloride	2.75	2.80	+1.82
10% sodium chloride	2.82	2.81	-0.35
20% sodium chloride	2.71	2.63	-2.95

(a) (i) Calculate the change in mass in g for the potato cylinder placed in distilled water.

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(1)

(ii) Calculate this change as a percentage of the original mass. Show your working.

Answer.....
(2)

(iii) Why is it better to compare percentage change in mass rather than change of mass in grams?

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(1)



Leave
blank

(b) Explain why the potato cylinder in 1% sodium chloride solution gained mass.

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(3)

(c) Which concentration of sodium chloride solution is most similar to the concentration of the cell sap in the potato cells? Explain your answer.

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(3)

(Total 10 marks)

Q6

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7. A large fish called a pike was caught from a lake. Its stomach contained a few small fish of a different species. The small fish were known to eat water plants.

(a) (i) Use this information to draw a food chain of these organisms.

(2)

(ii) Draw and label a pyramid of biomass of these organisms.

(2)

(iii) Which organism is the primary consumer?

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(1)



Leave
blank

(b) The small fish had been partly digested in the pike's stomach. Describe the processes that took place in the pike's stomach to digest the protein in the small fish.

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(2)

(c) Explain how catching too many pike (overfishing) would affect their population size.

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(2)

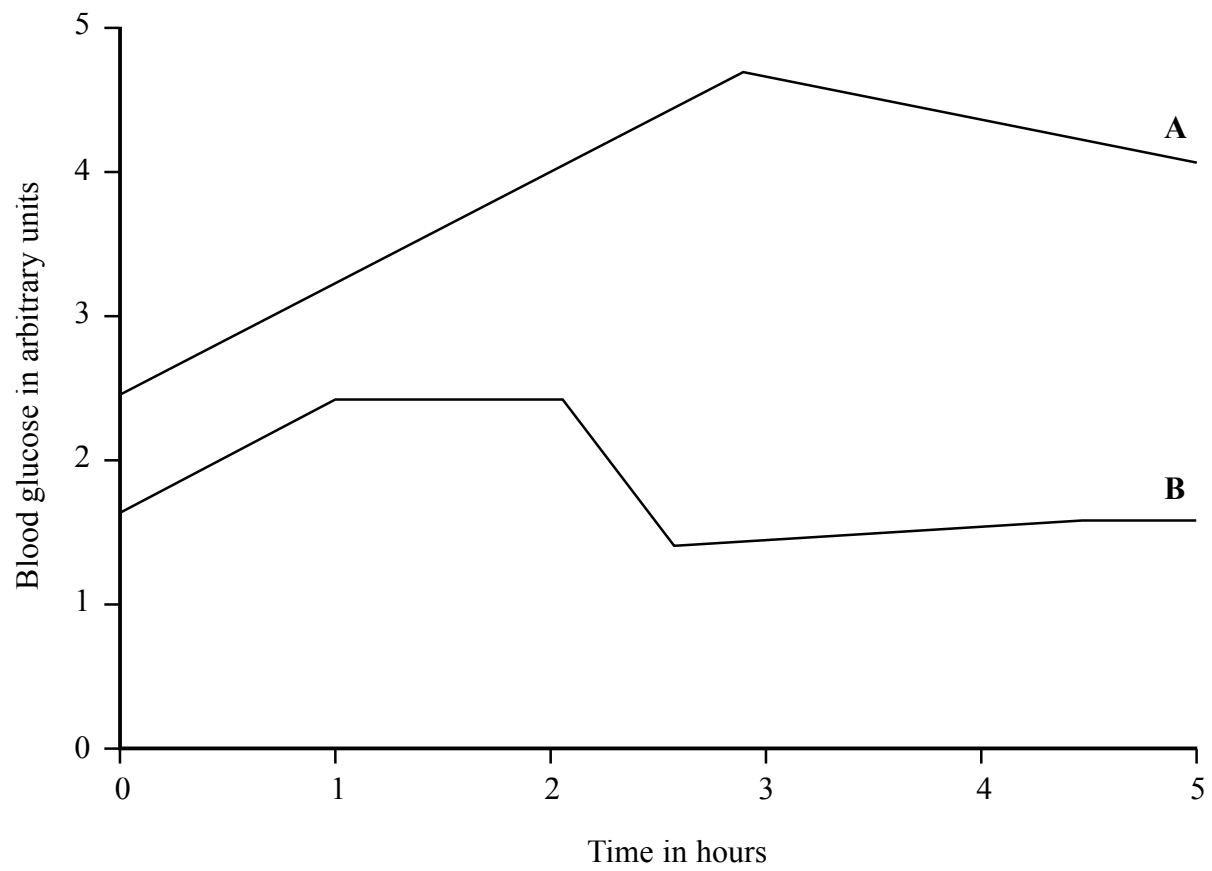
Q7

(Total 9 marks)



Leave blank

8. Two people, **A** and **B**, each drank a solution of glucose. The graph below shows the changes in the concentration of their blood glucose after having the drink.



(a) (i) Describe the changes in blood glucose for person **A** during the five hours after the glucose drink.

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(2)



Leave
blank

(ii) How do the changes in blood glucose for person **B** differ from person **A** during each of the five hours?

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(4)

(b) One of the people has a condition called diabetes, in which the body is unable to control its blood glucose level. Suggest which person has diabetes and give a reason for your choice.

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(1)

(c) Name **one** hormone produced in the body that regulates blood glucose concentration and state where it is produced.

Hormone

Where produced

(2)

Q8

(Total 9 marks)



Leave blank

9. (a) The table below shows some human diseases, the types of organism that cause the diseases and their methods of transmission. Complete the empty boxes in the table.

Disease	Type of organism	Method of transmission
AIDS		
	Bacteria	
Malaria		

(6)

(b) Describe **one** method of control for AIDS. Explain how this control method could reduce the spread of this disease.

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(3)

Q9

(Total 9 marks)



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10. Fish farming is a way of providing a source of protein for humans and animals.

(a) Describe and explain **two** ways in which fish farmers try to achieve maximum yield of fish in their ponds.

1

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2

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(4)

(b) Name **one** condition that may occur in young children who do not get enough protein in their diet.

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(1)

Q10

(Total 5 marks)



11. Chloroplasts are organelles found in the cytoplasm of leaf cells of plants, such as grass. Photosynthesis takes place in the chloroplast.

(a) (i) Name **one** other organelle found in the grass cells.

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(1)

(ii) Complete the word equation below to show the process of photosynthesis.

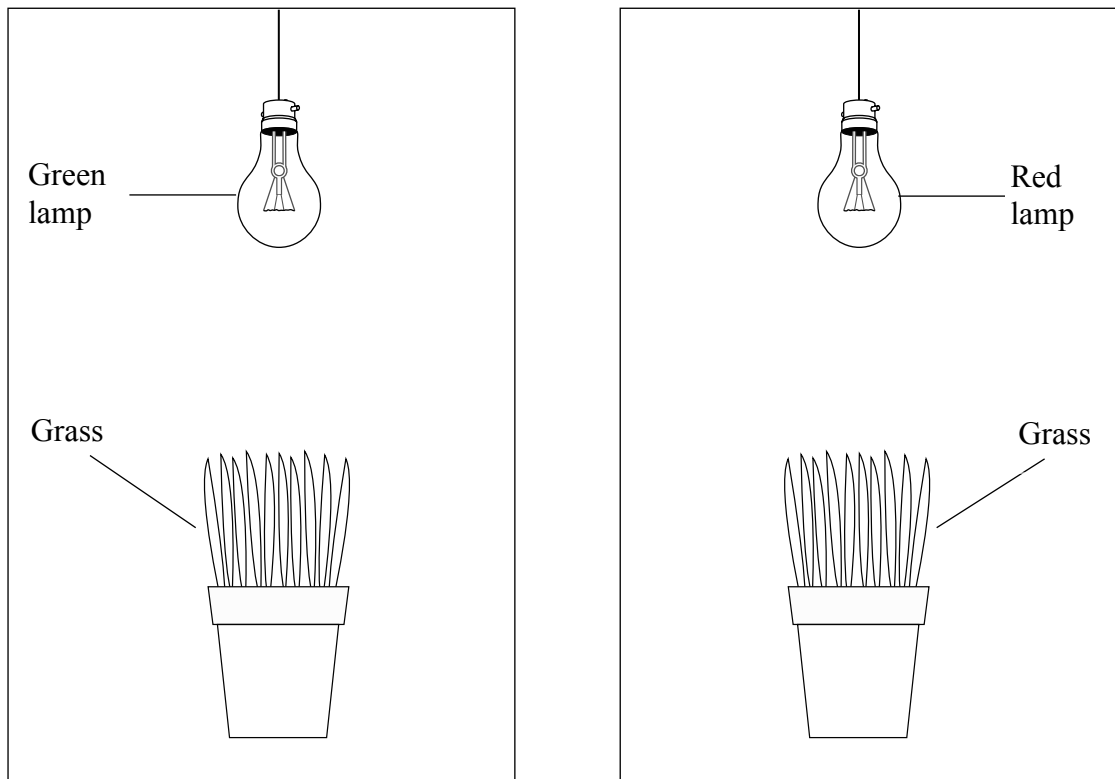
..... + → Glucose +
(2)

(b) Describe a test you could do to show that the cytoplasm in grass cells contains glucose.

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(3)



(c) The diagram below shows two similar pots containing grass plants. One was exposed to red light and the other was exposed to green light. They were left in these coloured lights for two days.



After two days the amount of starch produced by the plants in red light was greater than the amount of starch produced by the plants in green light.

Suggest an explanation for this result.

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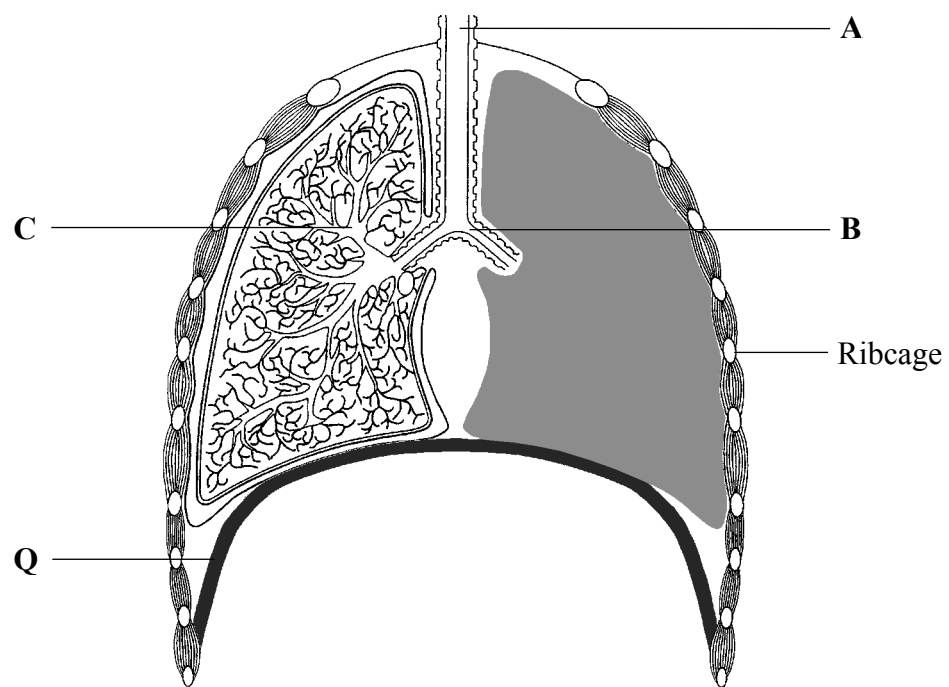
(3)

Q11

(Total 9 marks)



12. The diagram below shows structures in the human thorax.



(a) (i) Name the structures labelled **A**, **B** and **C**.

A

B

C

(3)

(ii) Give **one** function of the ribcage.

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(1)



Leave
blank

(iii) Describe the role of structure **Q** when breathing in.

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(2)

(b) Suggest how a stab wound to the chest would affect the functioning of the lungs.
Explain your answer.

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(2)

Q12

(Total 8 marks)



Leave
blank

13. The table below contains incomplete biological statements. Complete each statement by writing the correct number in the box. The first statement has been completed for you.

Statement	Number
The number of waste products of human anaerobic respiration is	1
The number of chambers in the human heart is	
The number of different elements in glucose is	
The number of chromosomes in red blood cells is	
The number of trophic levels in a food chain that ends with a tertiary consumer is	
The number of cells produced after a zygote divides three times by mitosis is	

Q13

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

END

