

Name:

## Year 3 – GCSE Practice Questions

Here is a range of questions to practise before your summer exam. They include:

- Graph interpretation questions
- Command terms: suggest, describe, explain
- Longer answer questions
- Calculation questions
- Investigation and data analysis questions
- Questions where you need to apply your knowledge to a new context

Markscheme can be found on:

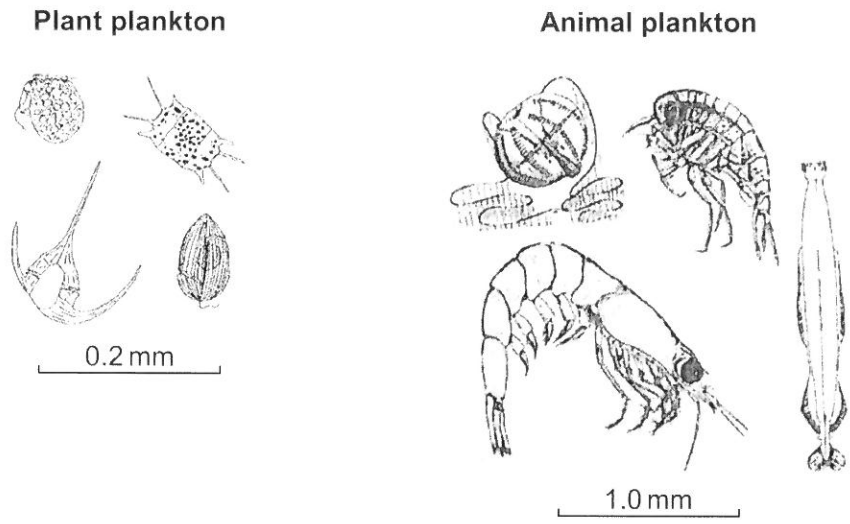
**[jemasters.wikispaces.com](http://jemasters.wikispaces.com)** on the “Recent Material” link and there is also a copy on the board in S4

It’s really important to check your answers match the key words in the mark scheme. If in doubt, ask me!

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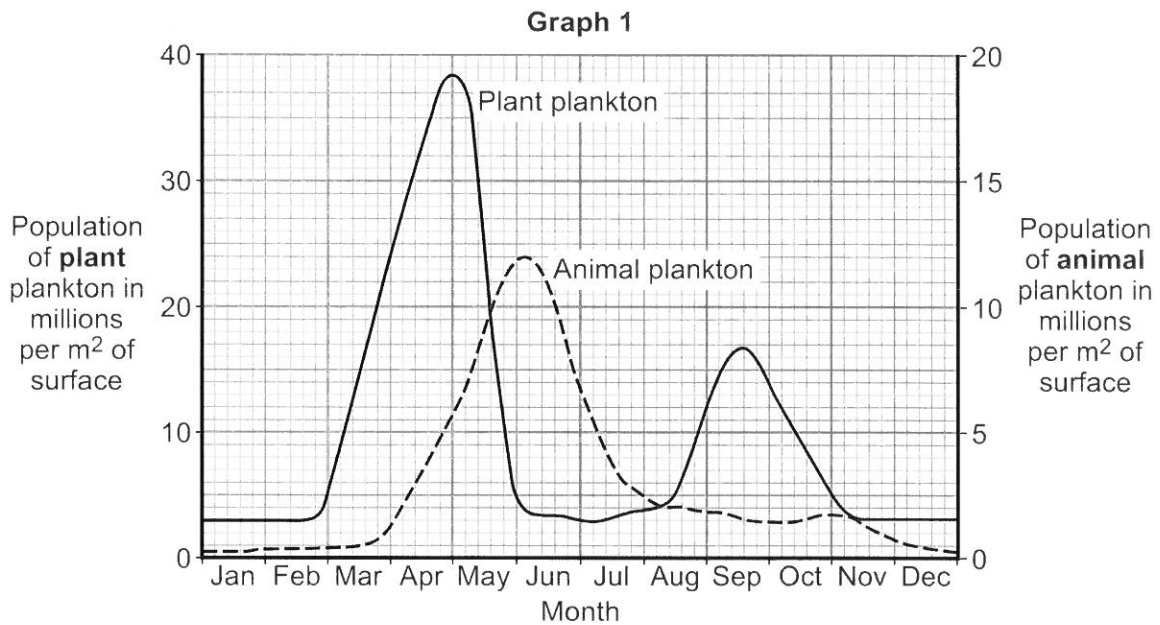
Plankton live in the sea.

The diagram shows plant plankton and animal plankton drawn to the scales shown.



Animal plankton eat plant plankton.

**Graph 1** shows how the populations of the plankton change through the year in the seas around the UK.

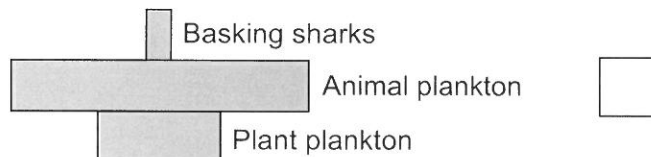
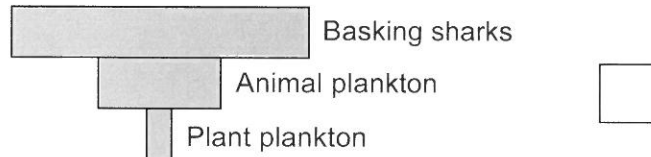
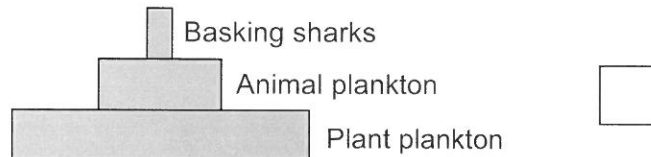


9 (a) Basking sharks eat animal plankton. Basking sharks grow up to 8 metres long.

Look at the diagram and **Graph 1**.

Which is the correct shape for the pyramid of biomass to show the relationship between plant plankton, animal plankton and basking sharks, in June?

Tick (✓) **one** box.



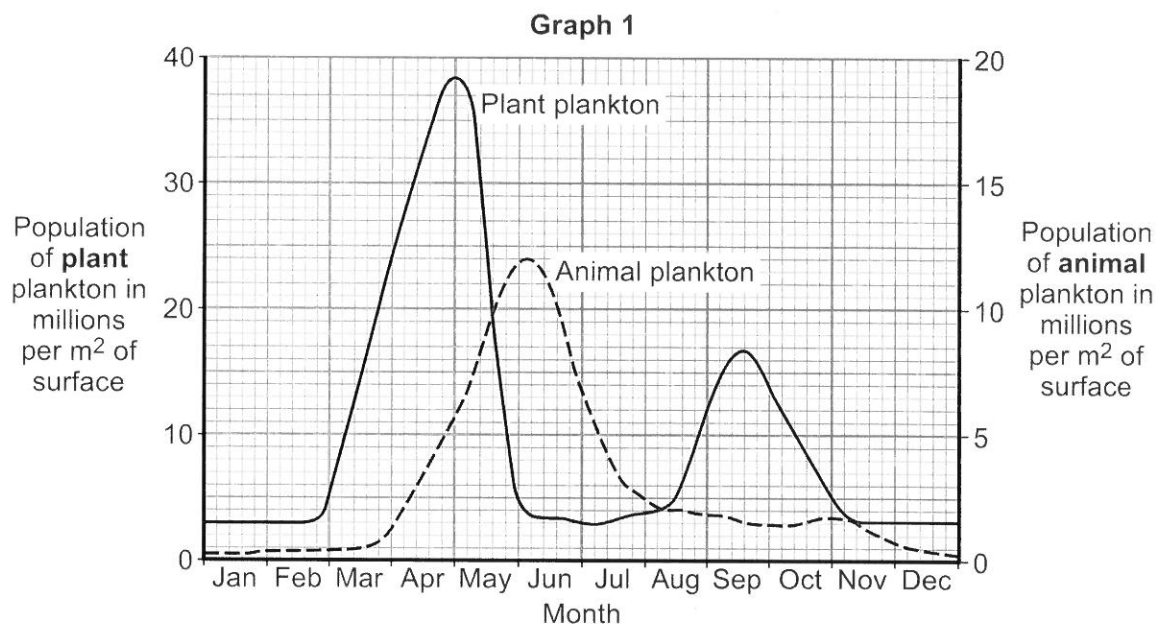
(1 mark)

Question 9 continues on the next page

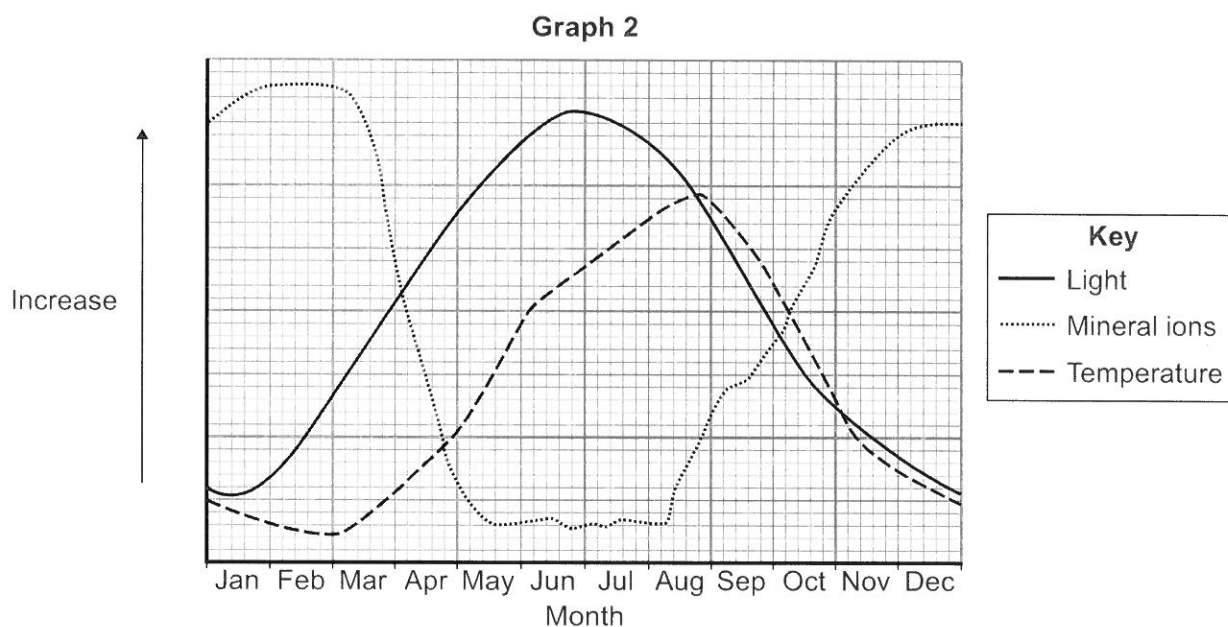
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Graph 1 is repeated here to help you answer the following questions.



Graph 2 shows changes in some of the conditions in the upper layers of the sea around the UK.



9 (b) The population of plant plankton increases between February and April.

Suggest **one** reason for the increase.

Explain your answer.

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(2 marks)

9 (c) The population of animal plankton changes between April and July.

Suggest explanations for the changes.

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(2 marks)

~~9 (d) The concentration of mineral ions changes between February and December.~~

~~Suggest explanations for the changes.~~

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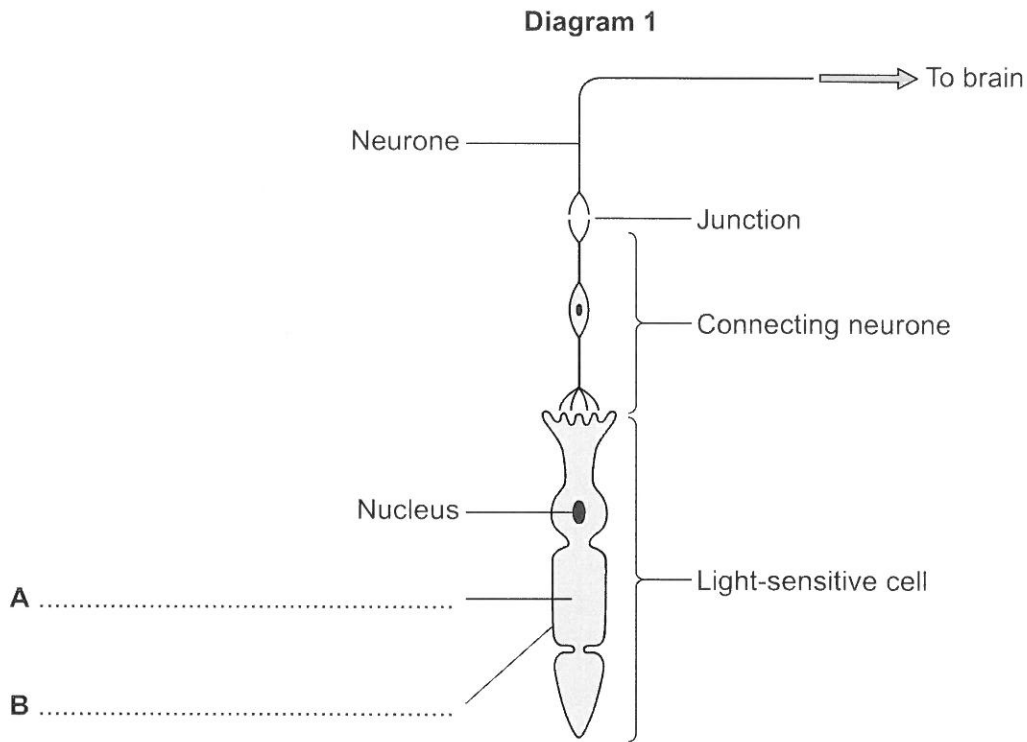
~~(3 marks)~~

85
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END OF QUESTIONS



7 **Diagram 1** shows cells from the light-sensitive layer in the eye.



7 (a) On **Diagram 1**, add labels to name part **A** and part **B** of the light-sensitive cell. (2 marks)

7 (b) There is a junction between the connecting neurone and the neurone carrying the impulse to the brain.

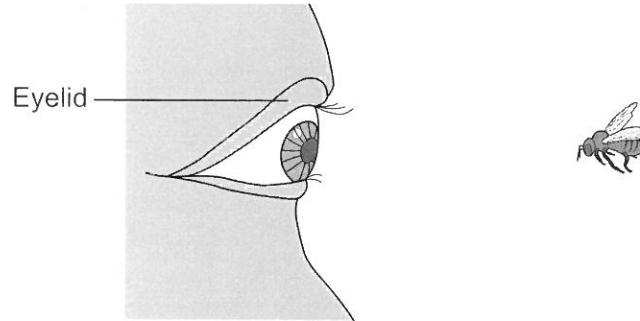
7 (b) (i) What name is given to the junction?  
 .....  
(1 mark)

7 (b) (ii) In what form is information passed across the junction?  
 .....  
 .....  
(1 mark)



7 (c) Diagram 2 shows a bee flying towards a man's eye.

Diagram 2



In the *blink reflex*, light from the bee reaches the light-sensitive cell in the eye. The muscles in the eyelid shut the man's eye before the bee hits the eye.

Describe the pathway taken by the nerve impulse in the *blink reflex*.

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(4 marks)

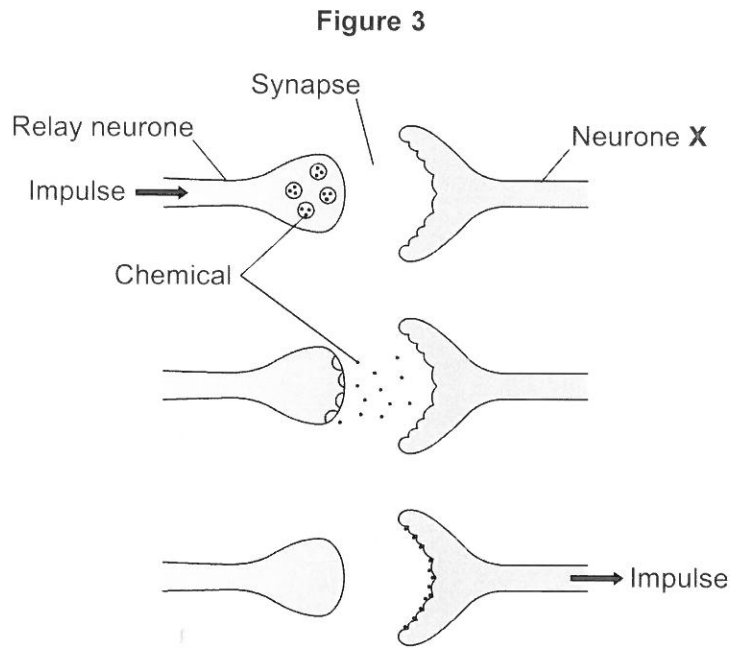
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Turn over for the next question

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5 **Figure 3** shows how a nerve impulse passing along a relay neurone causes an impulse to be sent along another type of neurone, neurone X.



5 (a) What type of neurone is neurone X?

[1 mark]

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5 (b) Describe how information passes from the relay neurone to neurone X. Use **Figure 3** to help you.

[3 marks]

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5 (c) Scientists investigated the effect of two toxins on the way in which information passes across synapses. **Table 2** shows the results.

**Table 2**

Toxin	Effect at the synapse
Curare	Decreases the effect of the chemical on neurone X
Strychnine	Increases the amount of the chemical made in the relay neurone

Describe the effect of each of the toxins on the response by muscles.

**[2 marks]**

Curare .....

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Strychnine .....

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2

**In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Animals and plants have features (adaptations) that allow them to survive in the conditions in which they normally live.

Describe how animals and plants are adapted to survive in dry conditions such as deserts.

For each adaptation that you give, describe how the adaptation helps the animal or plant to survive in dry conditions.

To obtain full marks you should refer to **both** animals and plants.

**[6 marks]**

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Answer **all** questions in the spaces provided.

**1** Food chains show the flow of energy through the organisms in a habitat.

**1 (a)** **Figure 1** shows a food chain.

**Figure 1**

grass → sheep → human

The biomass in each stage of the food chain changes as food passes along the food chain.

Draw a pyramid of biomass for this food chain.

Label the pyramid.

**[2 marks]**



1 (b) Table 1 shows three food chains, A, B and C.

Table 1

Food chain	
A	plants → sheep → human
B	plants → grasshoppers → frogs → trout → human
C	plants → human

1 (b) (i) In which food chain, A, B or C, will the greatest proportion of biomass and energy of the plants be passed to humans?

[1 mark]

1 (b) (ii) Give reasons why the food chain that you chose in part (b)(i) passes on the greatest proportion of biomass and energy to humans.

[3 marks]

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3 **Figure 2** shows an athlete running on a treadmill.

**Figure 2**



After running for several minutes, the athlete's leg muscles began to ache. This ache was caused by a high concentration of lactic acid in the muscles.

3 (a) The equation shows how lactic acid is made.



Name the process that makes lactic acid in the athlete's muscles.

**[1 mark]**

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3 (b) Scientists investigated the production of lactic acid by an athlete running at different speeds.

In the investigation:

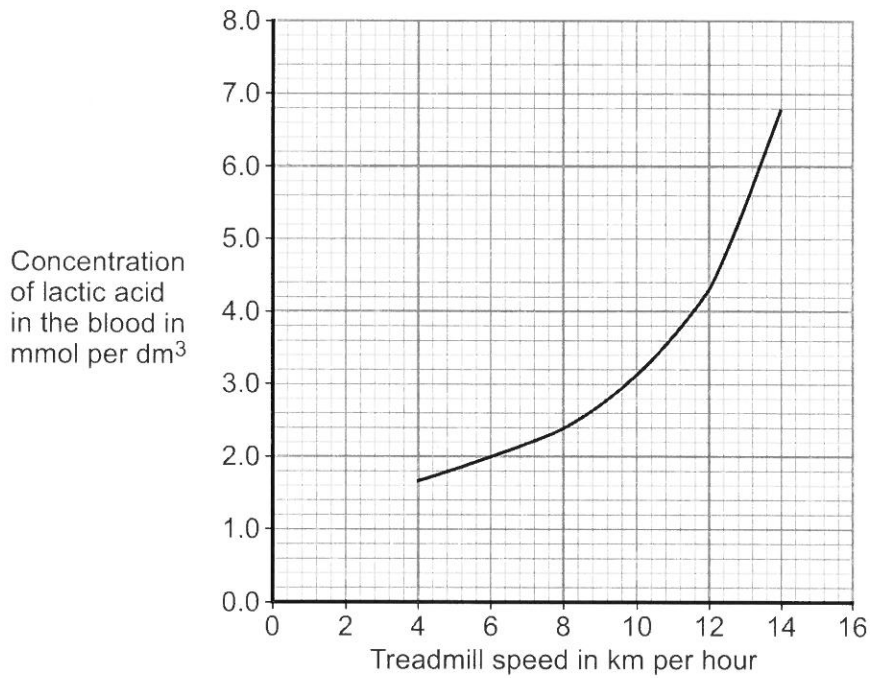
- the athlete ran on the treadmill at 4 km per hour
- the scientists measured the concentration of lactic acid in the athlete's blood after 2 minutes of running.

The investigation was repeated for different running speeds.

**Figure 3** shows the scientists' results.



Figure 3



3 (b) (i) How much more lactic acid was there in the athlete's blood when he ran at 14 km per hour than when he ran at 8 km per hour?

[2 marks]

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Answer = ..... mmol per dm<sup>3</sup>

3 (b) (ii) Why is more lactic acid made in the muscles when running at 14 km per hour than when running at 8 km per hour?

[3 marks]

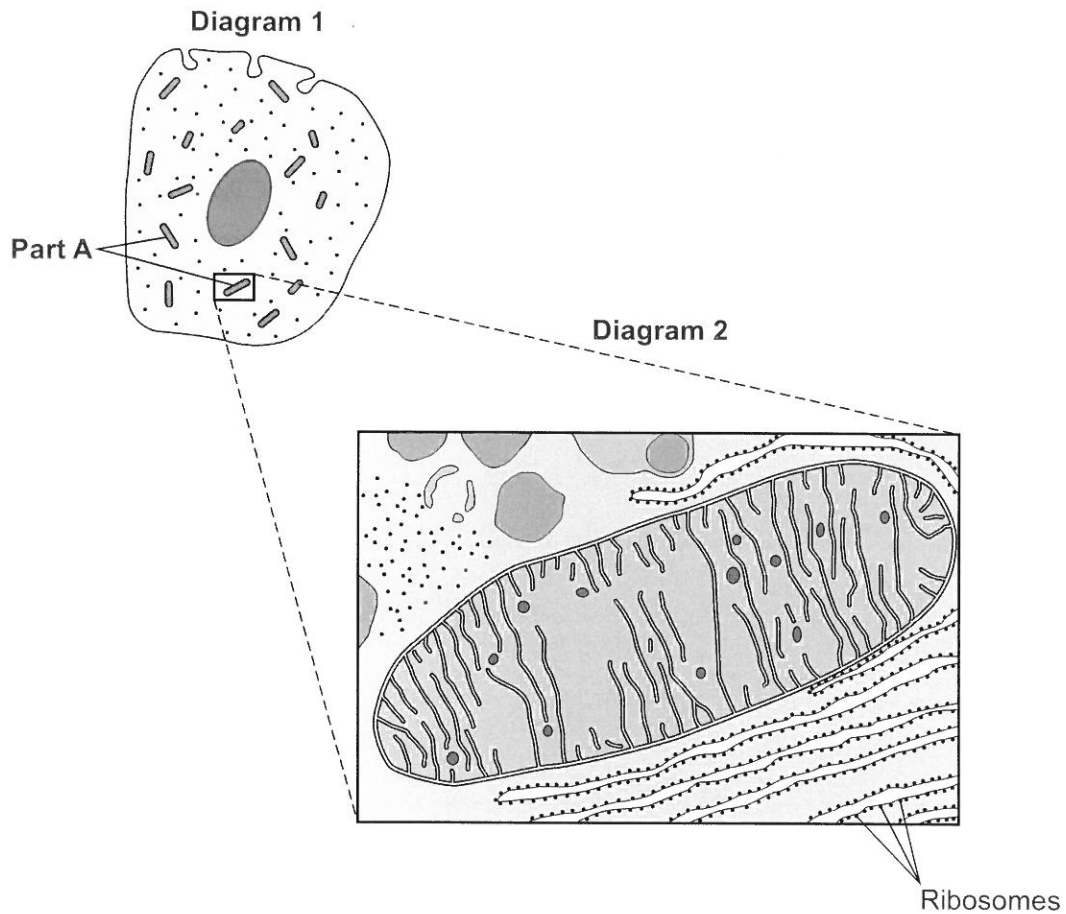
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3 **Diagram 1** shows a cell from the pancreas.

**Diagram 2** shows part of the cell seen under an electron microscope.



Part **A** is where most of the reactions of aerobic respiration happen.

3 (a) (i) Name part **A**.

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(1 mark)

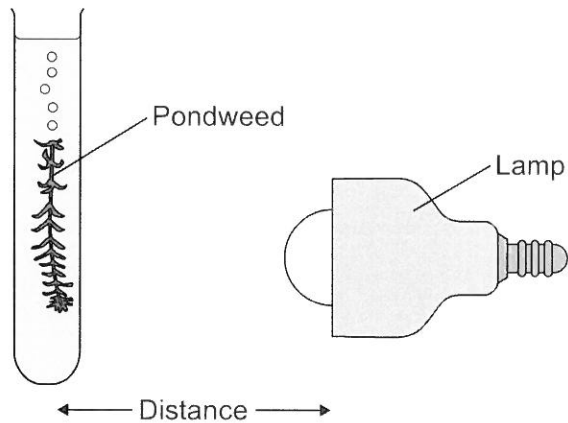
3 (a) (ii) Complete the equation for aerobic respiration.



Answer **all** questions in the spaces provided.

- 1 Some students investigated the effect of light intensity on the rate of photosynthesis. They used the apparatus shown in **Diagram 1**.

**Diagram 1**



The students:

- placed the lamp 10cm from the pondweed
- counted the number of bubbles of gas released from the pondweed in 1 minute
- repeated this for different distances between the lamp and the pondweed.

- 1 (a) The lamp gives out heat as well as light.

What could the students do to make sure that heat from the lamp did **not** affect the rate of photosynthesis?

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(1 mark)





1 (b) The table shows the students' results.

Distance in cm	Number of bubbles per minute
10	84
15	84
20	76
40	52
50	26

1 (b) (i) At distances between 15cm and 50cm, light was a limiting factor for photosynthesis.

What evidence is there for this in the table?

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(1 mark)

1 (b) (ii) Give **one** factor that could have limited the rate of photosynthesis when the distance was between 10cm and 15cm.

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(1 mark)

Question 1 continues on the next page

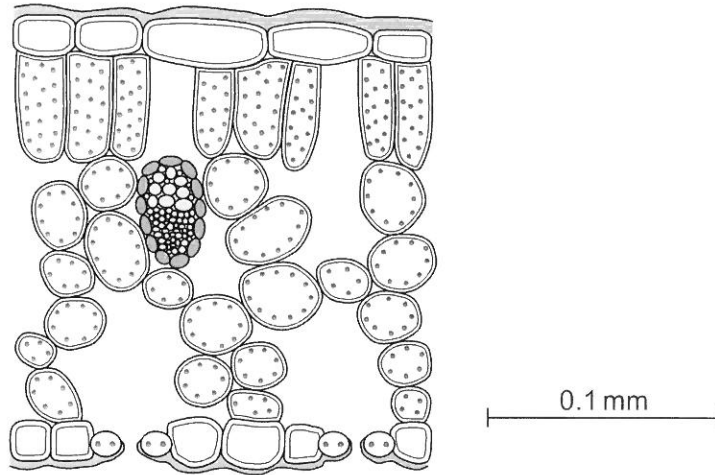
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1 (c) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

**Diagram 2** shows a section through a plant leaf.

**Diagram 2**



Describe the structure of the leaf and the functions of the tissues in the leaf.

You should use the names of the tissues in your answer.

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(6 marks)

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3 There are many ways to increase the efficiency of food production.

3 (a) The table shows the energy available to humans from two different food chains.

Food chain	Energy transferred to humans in kJ per hectare of crop
Wheat → humans	900 000
Wheat → pigs → humans	90 000

3 (a) (i) Compare the amount of energy the two food chains transfer to humans.

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(1 mark)

3 (a) (ii) Give **one** reason for the difference in the amount of energy the two food chains transfer to humans.

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(1 mark)



**3 (b)** *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Give methods used in the factory farming of animals.  
Explain the advantages and disadvantages of these methods.

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(6 marks)

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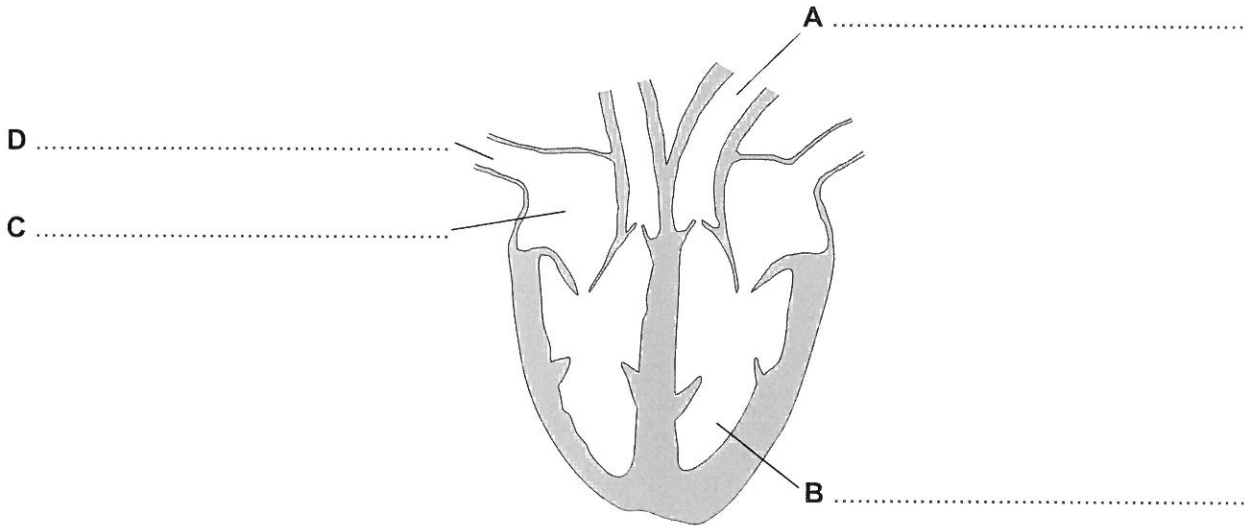
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Answer **all** questions in the spaces provided.

**1**      **Diagram 1** shows a section through the heart.

**Diagram 1**



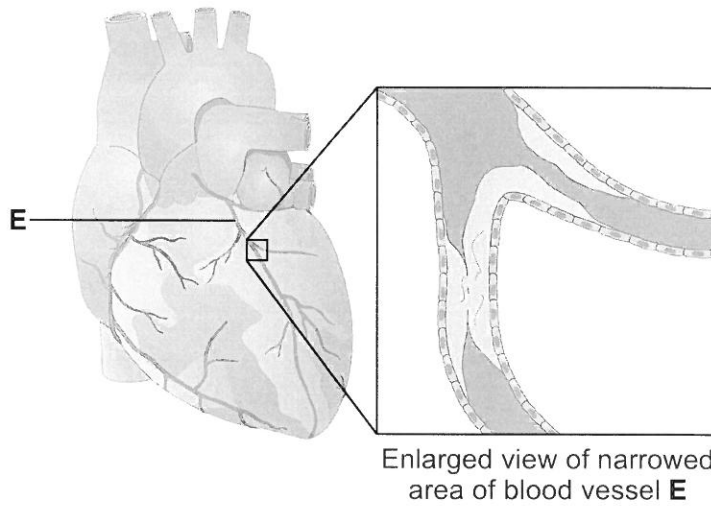
**1 (a)**      On the diagram, name the parts labelled **A**, **B**, **C** and **D**.

*(4 marks)*



1 (b) **Diagram 2** shows the blood vessels that supply the heart muscle.  
Part of one of the blood vessels has become narrower.

**Diagram 2**



1 (b) (i) Name blood vessel **E**.

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(1 mark)

1 (b) (ii) Give **one** method of treating the narrowed part of blood vessel **E**.

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(1 mark)

1 (b) (iii) Explain how the method of treatment works.

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(2 marks)

**Question 1 continues on the next page**

**Turn over ►**



4 Blood is part of the circulatory system.

4 (a) (i) Give **one** function of white blood cells.

[1 mark]

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4 (a) (ii) Which of the following is a feature of platelets?

Tick (✓) **one** box.

[1 mark]

They have a nucleus.

They contain haemoglobin.

They are small fragments of cells.

4 (b) Urea is transported by the blood plasma from where it is made to where the urea is excreted.

Complete the following sentence.

[2 marks]

Blood plasma carries urea from where it is made in the .....

to the ..... where the urea is removed from the blood.

**Question 4 continues on the next page**

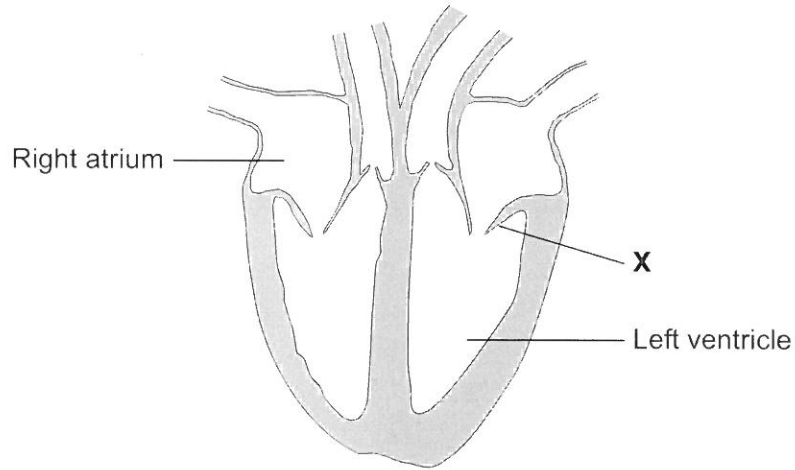
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4 (c) Figure 4 shows a section through the human heart.

Figure 4



Structure X is a valve. If valve X stops working, it may need to be replaced.

A scientist is designing a new heart valve. The scientist knows that the valve must be the correct size to fit in the heart.

Suggest **two** other factors the scientist needs to consider so that the newly designed valve works effectively in the heart.

[2 marks]

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