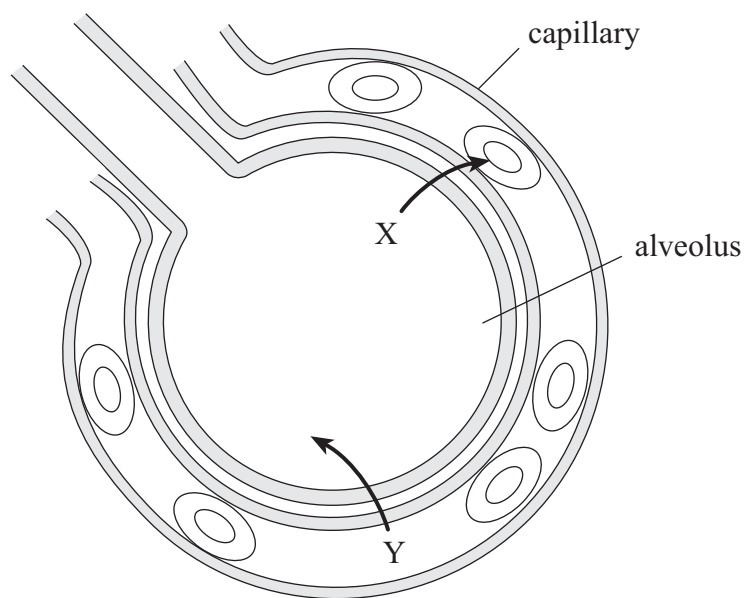




Answer ALL the questions. Write your answers in the spaces provided.

1. Gas exchange takes place in an alveolus.



(a) Name

(i) gas X ..... (1)

(ii) gas Y ..... (1)

(b) Gas Y is the product of respiration. Another product of respiration is also breathed out.

Name this substance.

..... (1)



Leave blank

(c) After sprinting 100 metres Faisa is breathing heavily. Also, she has cramp in her leg muscles.



Explain why Faisa has cramp.



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(4)

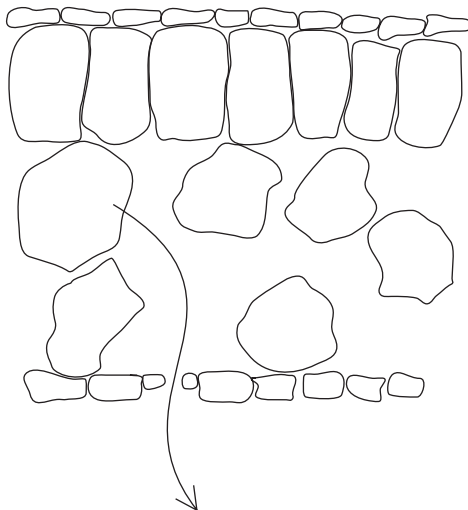
Q1

(Total 7 marks)



N 2 1 4 0 9 B 0 3 1 2

2. The diagram shows the passage of water from a cell in a leaf to the outside air.



(a) State the process by which water passes through stomata.

..... (1)

(b) Give **two** functions of water in the cells of a leaf.

1 .....

2 .....

(2)

Q2

(Total 3 marks)



3. Read the following article.

**Widespread deforestation continues to threaten the global environment.**  
There are no reliable figures for the extent of global deforestation. However deforestation is probably the most important cause of increased carbon dioxide in the atmosphere.

(a) Give **two** reasons for increased deforestation in recent years.

- 1 .....
- 2 ..... **(2)**

(b) Suggest **one** reason why there are no reliable figures for the extent of global deforestation.

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

(c) During deforestation tree roots are often left in the soil.  
Carbon dioxide is released from the dead roots over several months.  
What happens to cause this?

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

**(Total 5 marks)**

**Q3**



Leave  
blank

4. (a) Describe the role of insulin in the control of blood glucose.

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

(2)

(b) Insulin is used to treat diabetes. In the past insulin was obtained from cows and pigs but is now produced by genetically modified bacteria.

Give **two** advantages of using insulin produced by the genetically modified bacteria.

1 .....

2 .....

(2)

Q4

(Total 4 marks)



Leave  
blank

5. Sickle cell anaemia is caused by a gene which results in damaged red blood cells. The damaged cells can become clumped inside capillaries.

(a) Describe **one** symptom shown by a person with sickle cell anaemia.

.....  
(1)

(b) Red blood cells are made from stem cells in bone marrow.

Trials using gene therapy have inserted a different gene into stem cells. This gene reduces the number of red blood cells that clump. As a result the symptoms of sickle cell anaemia are less severe.

Explain why parents who receive this gene therapy would still produce children who have severe symptoms.

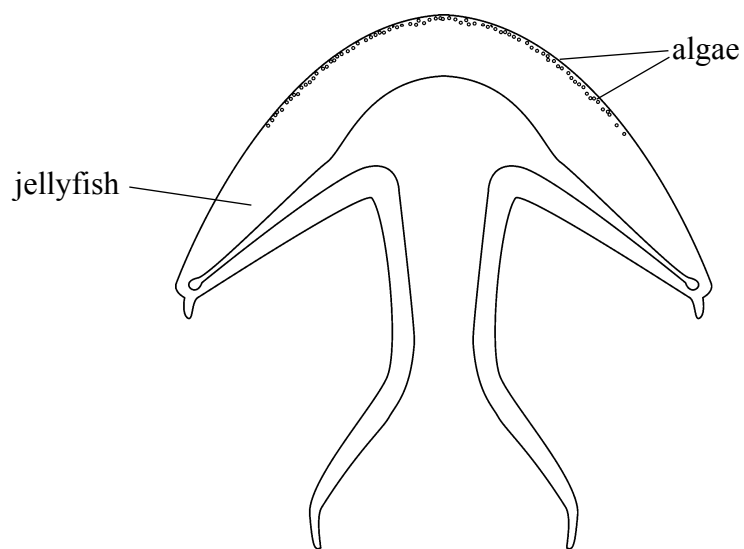
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(3)

(Total 4 marks)

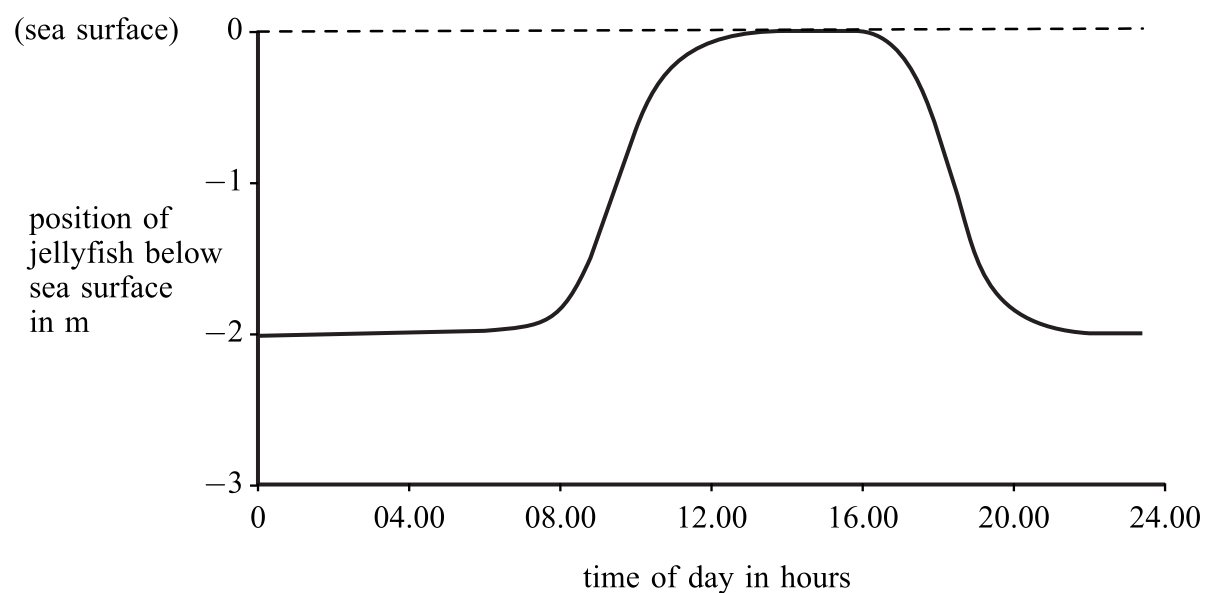
Q5



6. Jellyfish are clear, soft-bodied animals that live in the sea. One species has tiny plants called algae which contain chlorophyll, living just beneath the surface of their skin.



The graph shows the position of these jellyfish in the sea during 24 hours.



- (a) The jellyfish absorb sugar produced by the algae.

Explain how moving closer to the surface of the sea results in more sugar becoming available to the jellyfish.

.....

.....

.....

.....

(2)





Leave  
blank

(b) The algae help the jellyfish to grow. Nitrate ions in the sea are found in the greatest concentration at a depth of two metres.

Explain how diving results in increased growth in the jellyfish.

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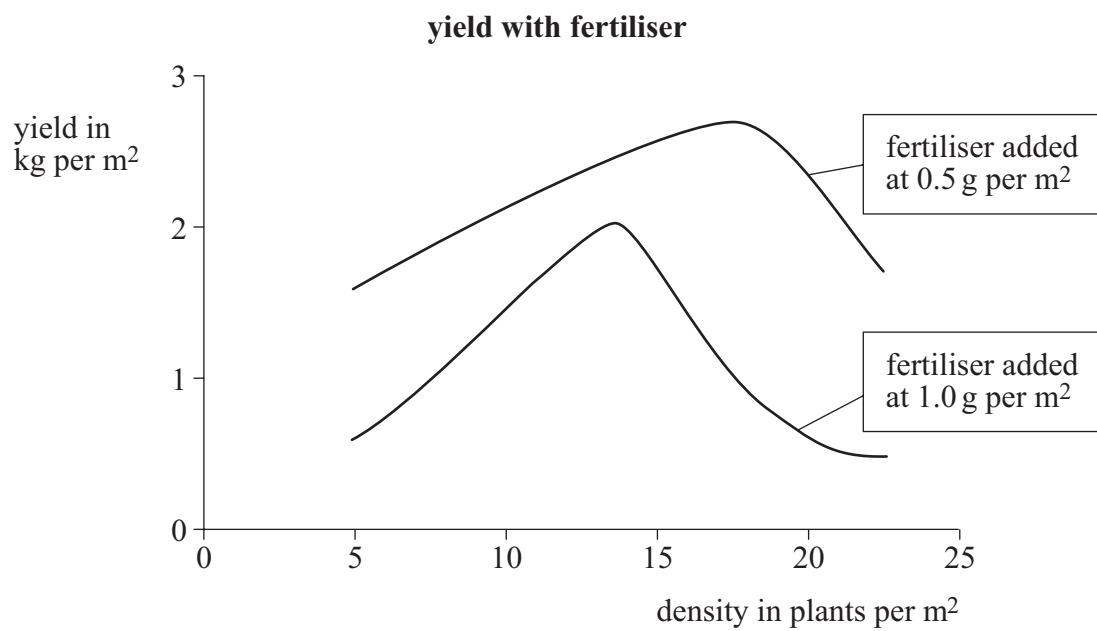
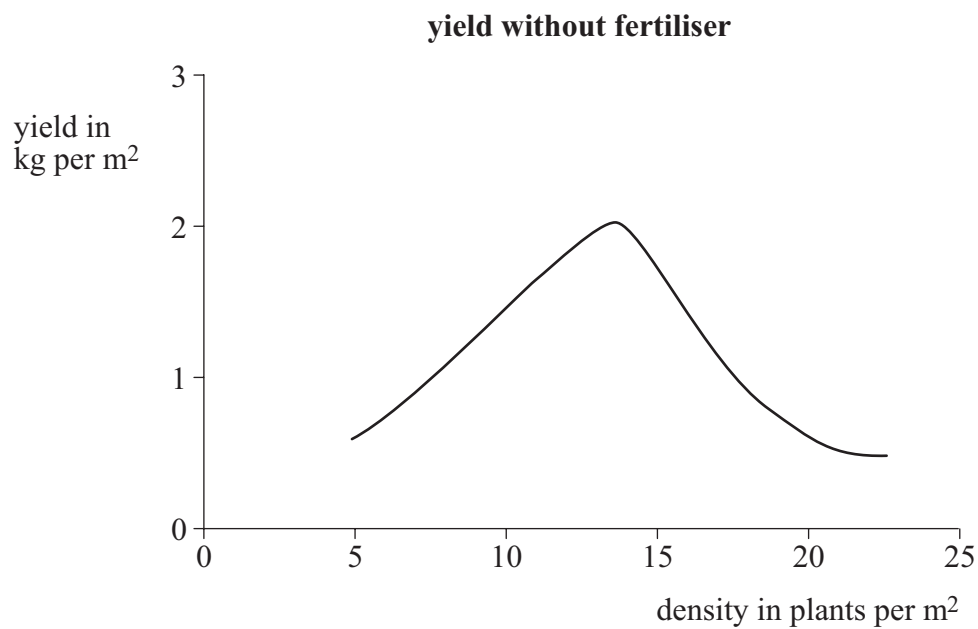
(2)

Q6

(Total 4 marks)



7. (a) An experiment on plant growth produced the following results.



Using these results, what advice would you give to a grower on how to maximise yield?

.....  
.....

**(1)**



Leave  
blank

(b) Excess inorganic fertiliser added to the soil in solution may result in plants losing water from their roots.

Explain how this water loss occurs.

.....

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.....

.....

(2)

(Total 3 marks)

Q7

**TOTAL FOR PAPER: 30 MARKS**

**END**



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