

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

- (a) Describe how water is moved through a plant according to the *cohesion-tension* hypothesis.

(4)

- (b) The mass of water lost from a plant was investigated. The same plant was used in every treatment and the plant was subjected to identical environmental conditions. In some treatments, the leaves were coated with a type of grease. This grease provides a waterproof barrier. The results of the investigation are given in the table.

Treatment	Mass lost in 5 days / g
No grease applied	10.0
Grease applied only to the upper surface of every leaf	8.7
Grease applied to both surfaces of every leaf	0.1

- (i) What is the advantage of using the same plant in every treatment?

(1)

- (ii) Why was it important to keep the environmental conditions constant?

(1)

- (iii) What is the evidence that the grease provides a waterproof barrier?

(1)

- (c) (i) Calculate the mass of water lost in 5 days through the upper surface of the leaves.

Answer _____

(1)

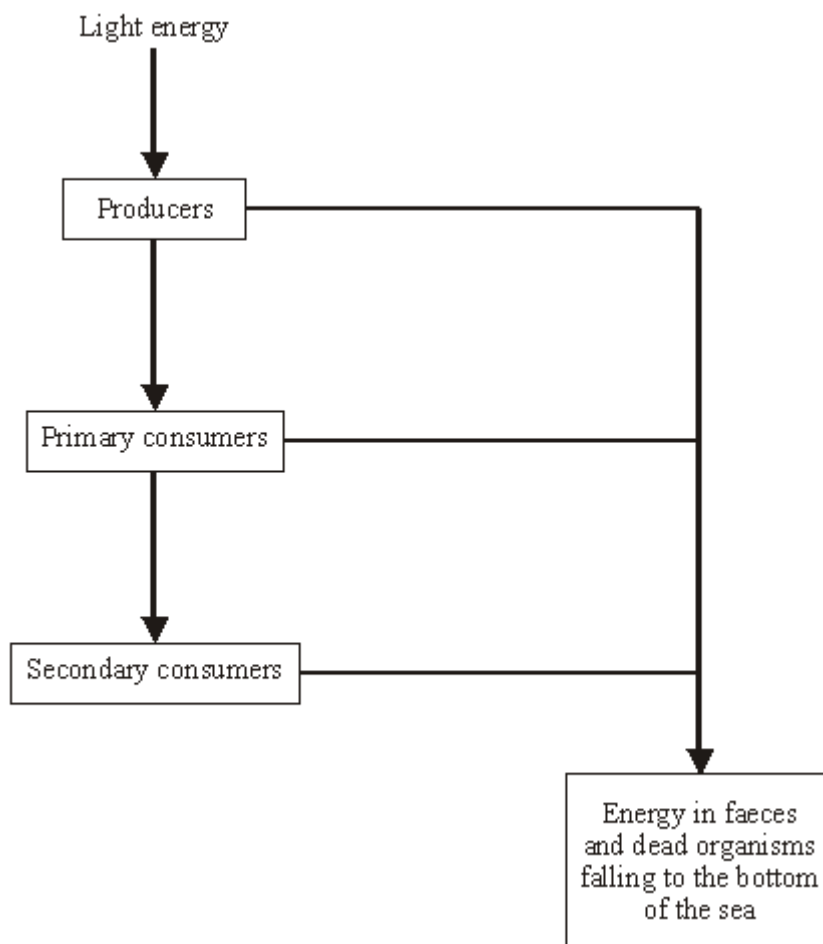
- (ii) Use your knowledge of leaf structure to explain why less water is lost through the upper surface of leaves than is lost through the lower surface.

(2)

(Total 10 marks)

Q2.

The diagram shows the flow of energy through a marine ecosystem.



- (a) Give **one** reason why not all the light energy falling on the producers is used in photosynthesis.

(1)

- (b) The producers in this ecosystem are seaweeds, which have a large surface area to volume ratio. Give **two** advantages to seaweeds of having a large surface area to volume ratio.

1. _____

2. _____

(2)

- (c) Some species of seaweed are submerged in water for most of the time. Explain how being under water might affect the rate of photosynthesis.

(3)
(Total 6 marks)

Q3.

A decrease in the pH of blood plasma reduces the affinity of haemoglobin for oxygen.

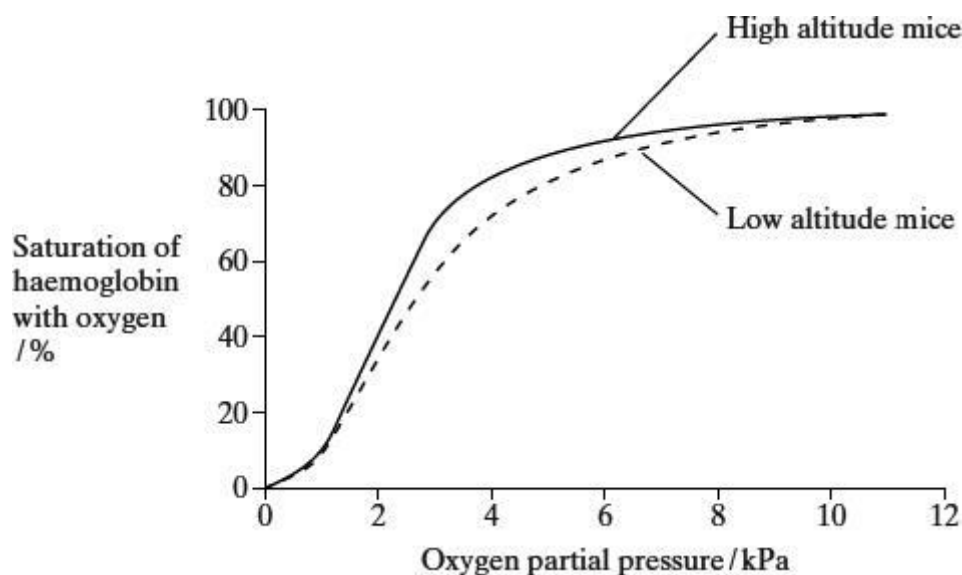
- (a) (i) Explain how aerobic respiration in cells leads to a change in the pH of blood plasma.

(2)

- (ii) What is the advantage to tissue cells of a reduction in the affinity of haemoglobin for oxygen when the plasma pH decreases?

(2)

- (b) Deer mice are small mammals which live in North America. One population lives at high altitude and another at low altitude. Less oxygen is available at high altitude. The graph shows the oxygen haemoglobin dissociation curves for the two populations of deer mice.



- (i) Explain the advantage for mice living at high altitude in having a dissociation curve which is to the left of the curve for mice living at low altitude.

(2)

- (ii) Suggest why it would be a disadvantage for the curve to be much further to the left.

(1)

(Total 7 marks)