



GCE AS Level Biology

S21-B400U20-1

Assessment Resource 7

Biodiversity and Physiology of Body Systems Resource A

1. Organisms display a wide range of feeding mechanisms. For example, *Amoeba* are holozoic and feed by ingesting food particles which are digested intracellularly, whereas fungi are saprotrophic.

(a) Define the term *saprotrophic*. [1]

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(b) The parasitic tapeworm *Taenia solium* is an endoparasite that completes its life cycle in two different species of animal, humans and pigs. As an adult, *T. solium* lives in the human intestine. The tapeworm has no mouth or alimentary canal and relies on anaerobic respiration to provide energy.

(i) Describe how the tapeworm is adapted to resist peristalsis in the human intestine. [1]

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(ii) Explain why the tapeworm does not need a mouth or alimentary canal. [2]

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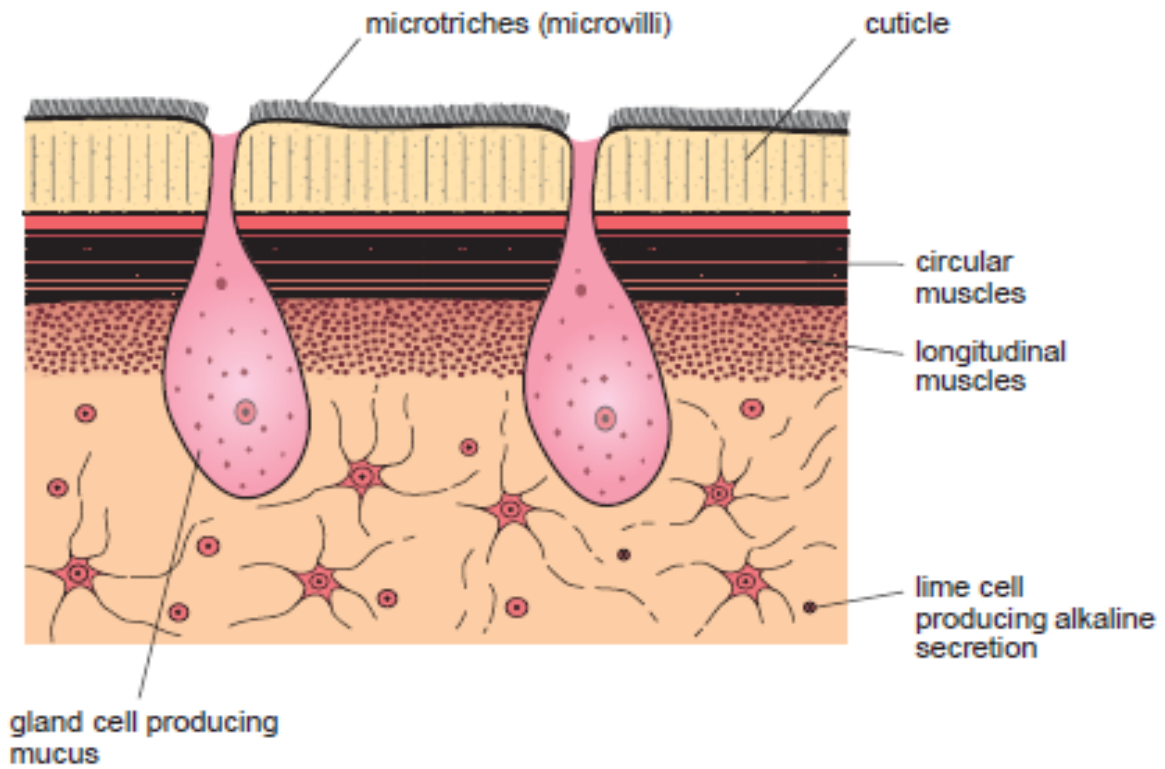
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(iii) Suggest why the tapeworm relies on anaerobic respiration for its metabolism. [1]

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(c) The diagram below shows a section of the tapeworm's body wall.



(i) Describe and explain how the adaptations visible in the diagram enable the tapeworm to survive in the environment within the host. [4]

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(ii) Body wall cells of *T. solium* have been observed to contain transmembrane proteins involved in active transport mechanisms. Suggest how these mechanisms aid the survival of the parasite within its host. [2]

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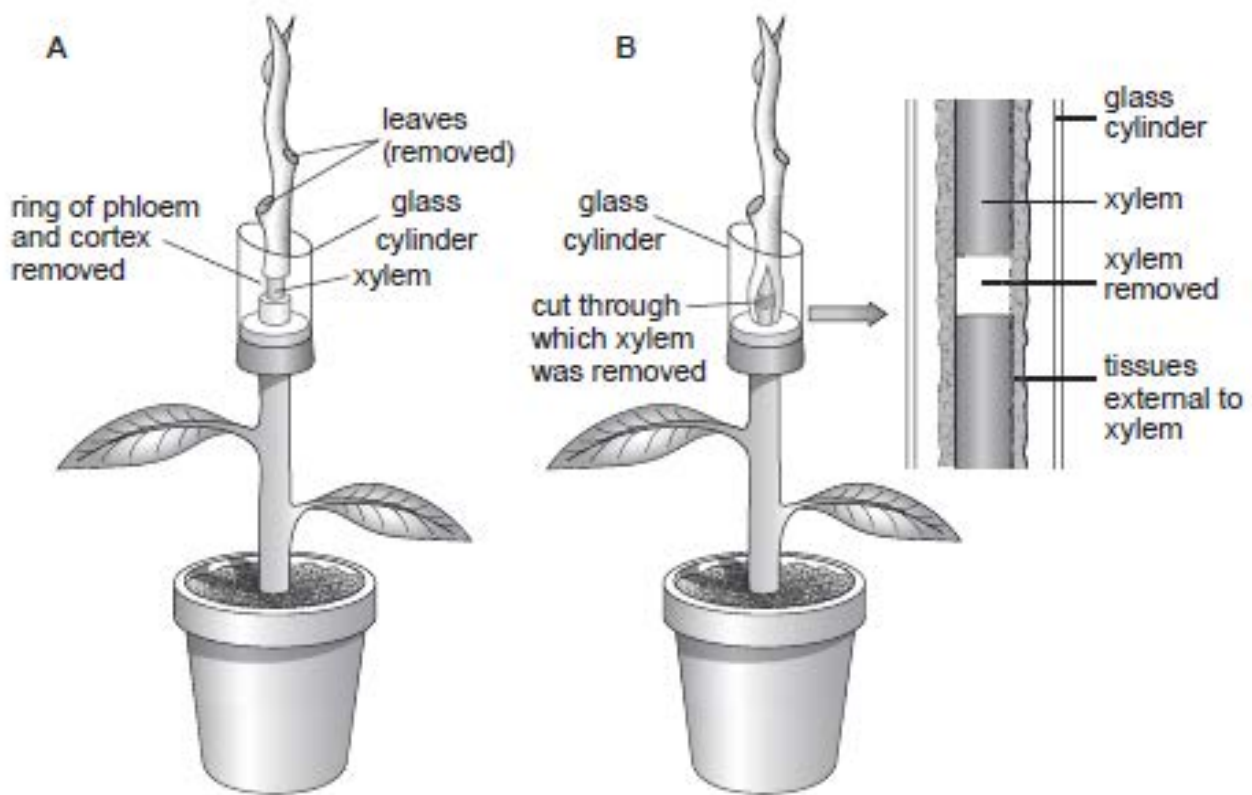
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2. An investigation was carried out into the transport of sugars in the stems of actively growing woody shoots. The leaves were removed from the shoots above the region to be investigated and the shoots were divided into three experimental groups.

- Plant A had all the tissues (phloem and cortex) outside the xylem removed in a ring at the base of the region from which the leaves had been removed.
- In plant B the xylem was removed from the centre of the stem at the base of the region with the leaves removed. This left the phloem and cortex intact except for the cut through which the xylem was removed (see diagram below).
- Plant C – control (not shown).

Each stem was enclosed in a clear glass cylinder. The cylinders were filled with distilled water which was changed daily. No sugars were detected in the water at any point during the investigation.



(a) Suggest how Plant C was set up as a control for the experiment.

[2]

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(b) (i) Explain why the leaves were removed above the region to be investigated. [2]

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(ii) Suggest why:

I. Each stem was enclosed in a glass cylinder containing distilled water. [1]

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II. The water was changed daily. [1]

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Question continued on next page.

(c) The results after running the experiment for six days are shown in the table below.

Plant	Increase in length of stem/mm	Total sugar in stem above cut region/mg
A	8.3	0.08
B	48.7	5.28
C	68.2	3.21

Explain the difference in the results:

(i) between A and B [3]

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(ii) between B and C [2]

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(d) (i) With reference to the results table, suggest how the reliability of the results might have been improved. [1]

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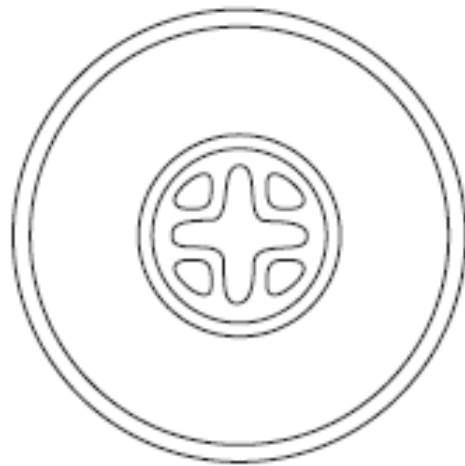
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(ii) State two variables which should have been controlled in this experiment. [1]

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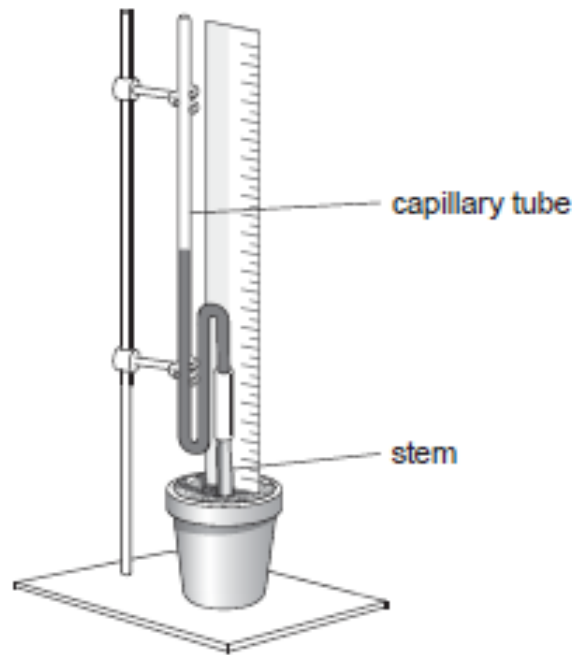
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The diagram below shows a cross section of a root from one of the plants used in the experiment.



- (e) Indicate with an arrow on the diagram where you would expect to find the Casparian strip. [1]

The apparatus below can be used to demonstrate the formation of root pressure in a plant under certain conditions.



When cyanide solution was added to the soil in the pot the root pressure was observed to fall significantly.

- (f) With reference to the role of the Casparian strip, explain how cyanide would result in the reduction in root pressure observed. [3]

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