

9.3 Growth in Plants

Question Paper

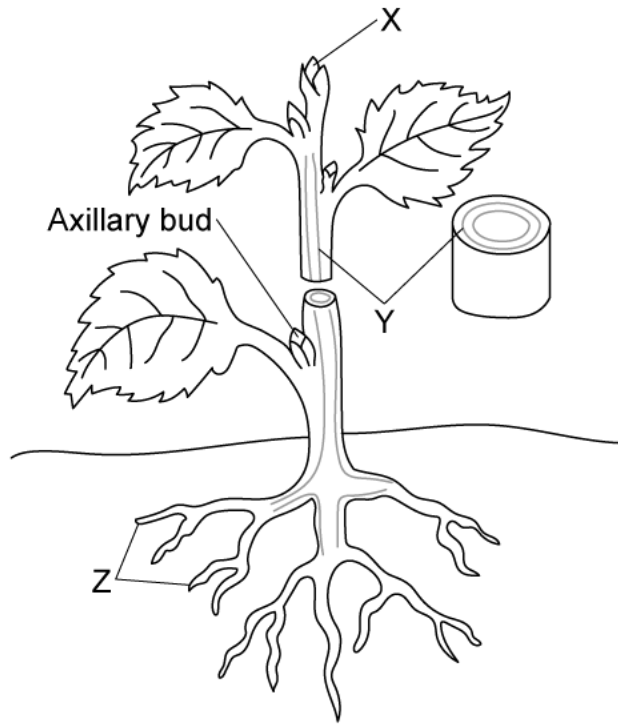
Course	DP IB Biology
Section	9. Plant Biology (HL Only)
Topic	9.3 Growth in Plants
Difficulty	Easy

Time allowed: 50
Score: /41
Percentage: /100

Question 1a

a)

The image below shows a representation of a growing plant.



Identify structures X-Z in the image above.

[3 marks]

[3 marks]

Question 1b

b)
The cells in structures **X-Z** in part a) divide constantly.

i)
Identify the type of cell division taking place in structures **X-Z**.

[1 mark]

ii)
Describe what happens to the daughter cells produced by the process named in part i).

[2 marks]

[3 marks]

Question 1c

c)
State **one** feature of the cells found in structures **X-Z** in the image in part a) **other** than the feature described in part b).

[1 mark]

[1 mark]

Question 1d

d)
The image in part a) shows the location of regions known as axillary buds.

Describe the effect of the following plant hormones on axillary buds:

i)
Auxin

[1 mark]

ii)
Cytokinins

[1 mark]

[1 mark]

Question 2a

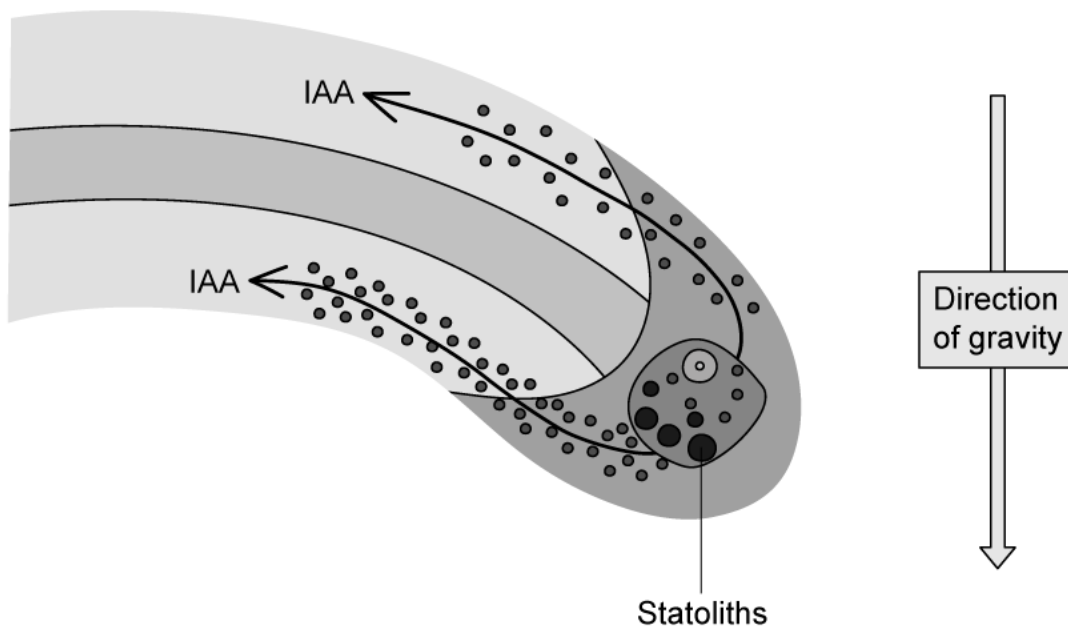
a)
State the meaning of the term **tropism**.

[2 mark]

[2 marks]

Question 2b

b)
The diagram below shows the events taking place during a tropism in a plant root.



Explain the role of statoliths in this type of tropism.

[2 marks]

[2 marks]

Question 2c

c)

Other than the role of statoliths, outline the events that cause the tropism shown in part b).

[2 marks]

[2 marks]

Question 2d

d)

i)

Identify **one** example of a tropism **other** than the tropism shown in part b).

[1 mark]

ii)

Outline the benefit to the plant of the tropism identified in part i).

[2 marks]

[3 marks]

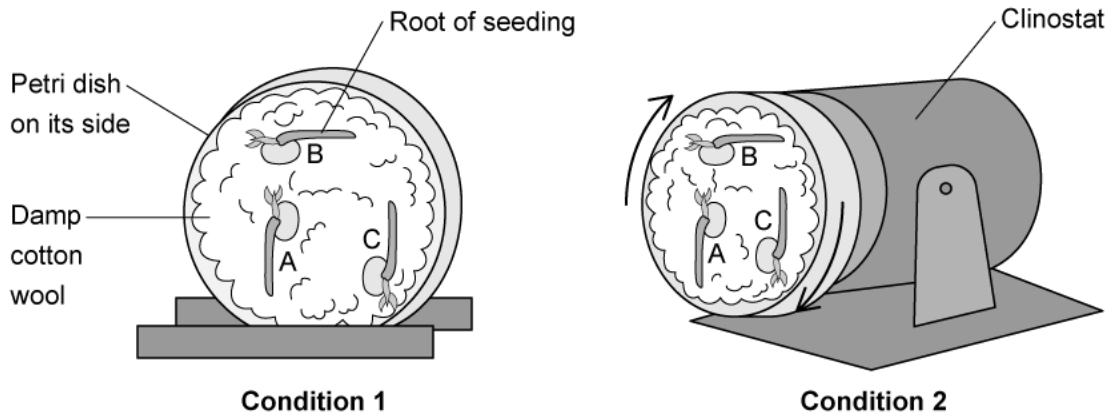
Question 3a

a)

An investigation was carried out into the effects of gravity on seedling root growth. The experiment was set up as shown in the diagram below.

Note that:

- Both conditions 1 and 2 were set up in the dark.
- A clinostat is a piece of equipment that rotates slowly over time.



Suggest the purpose of the following:

i)

Setting up the experiment in the dark.

[1 mark]

ii)

The damp cotton wool.

[1 mark]

iii)

The clinostat in condition 2.

[1 mark]

[3 marks]

Question 3b

b)

Identify a **quantitative** variable that the researcher could measure in the experiment shown in part a) to find out about the effect of gravity on the growth of seedling roots.

[1 mark]

[1 mark]

Question 3c

c)

Sketch the results that you would expect for seedling B in the experiment in part a) in:

i)

Condition 1

[1 mark]

ii)

Condition 2

[1 mark]

[2 marks]

Question 3d

d)

Experiments such as that shown in part a) can be used to find out about the large-scale effects of different stimuli on plant growth, but cannot tell researchers anything about the underlying processes inside plant cells.

Outline how modern scientists can find out about the processes occurring inside plant cells.

[2 marks]

[2 marks]

Question 4a

a)

Identify **one** feature of plant growth that makes plants suitable for micropropagation.

[1 mark]

[1 mark]

Question 4b

b)

State the reasons for each of the following stages of the micropropagation process:

i)

The explant is taken from meristematic tissue.

[1 mark]

ii)

The agar gel is sterilised.

[1 mark]

iii)

The agar gel contains 10 times more auxin than cytokinin.

[1 mark]

[3 marks]

Question 4c

c)

Identify **three** advantages of using micropropagation in plant production.

[3 marks]

[3 marks]

Question 5a

One mark is available for clarity of communication throughout this question.

a)

Outline the role of meristems in plant growth.

[6 marks]

[6 marks]

Question 5b

b)

Outline the role of auxin in the shoot response to light.

[3 marks]

[3 marks]



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