EXAM PAPERS PRACTICE

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9.3 Growth in Plants

Medium

BIOLOGY

IB HL

9.3 Growth in Plants

Question Paper

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

Time allowed: 20

Score: /10

Percentage: /100

Question 1

A gardener accidentally cut off the apical meristem while pruning a shrub in her garden. After a few weeks she noticed some changes in the growth of the shrub.

Which of the following would most accurately describe these changes?

A. The shrub would grow much taller and the axillary buds would be inhibited

B. The main stem of the shrub would greatly increase in diameter

C. The axillary buds will develop and lead to greater branching in the shrub

D. The axillary buds will be inhibited leading to less branching in the shrub

[1 mark]

Question 2

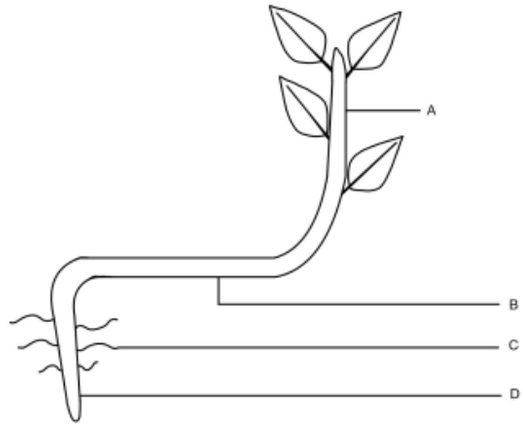
Which of the following meristems is correctly matched with the tissue that it can form?

	Meristem	Tissue
A	Ground tissue	Parenchyma forming the pith
B	Protoderm	Collenchyma forming supportive tissue
C	Procambium	Epidermis
D	Protoderm	Xylem and Phloem

[1 mark]

Question 3

A pot plant falls over and after a few days shows the following growth pattern.



Which of the following is the most accurate explanation for the growth shown at each of the labels on the diagram?

A. This part of the stem demonstrates negative gravitropism in order to receive the maximum amount of sunlight for photosynthesis

B. This part of the stem shows positive phototropism as it will bend towards the light

C. The lateral roots demonstrates negative gravitropism as they are not growing towards gravity

D. The main root shows positive gravitropism as it is bending towards gravity

[1 mark]

Question 4

What would **not** be considered a function of auxins?

A. Stimulates cell elongation in shoots, leading to an increase in plant height

B. Stimulates the development of axillary buds further away from the shoot apical meristem

C. Inhibits the development of axillary buds close to the shoot apical meristem

D. Inhibits cell elongation in root cells, therefore slowing down root growth

[1 mark]

Question 5

The following steps describe the possible pathway of gene expression affecting the transport of auxin in a plant.

I. This affects the expression of certain genes coding for PIN3 proteins
II. There is a change in their 3D shape
III. Light energy is absorbed by phototropins
IV. Phototropins bind to receptors inside the cell

Which of the following represents the correct order of these steps?

A. IV → I → II → III

B. III → II → IV → I

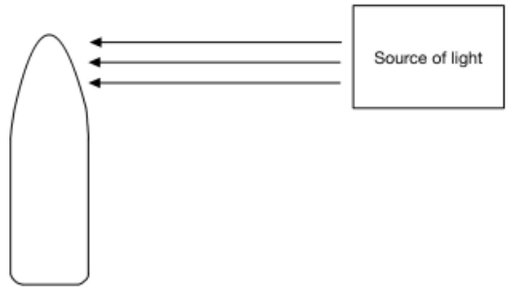
C. IV → II → III → I

D. III → IV → II → I

[1 mark]

Question 6

Which would be the most accurate description and explanation for the growth response that would be observed in the shoot tip below?



	Description	Explanation
A	The shoot tip grows away from the light source	Auxins inhibit cell elongation on the shady side of the shoot tip
B	The shoot tip grows towards the light source	Auxins inhibit cell elongation on the side of the light source
C	The shoot tip continues to grow straight up	Auxins are evenly distributed across the shoot tip
D	The shoot tip grows towards the light source	Auxins cause cell elongation on the shady side of the shoot tip

[1 mark]

Question 7

Which of the following would explain the reason why a root turned on its side shows positive gravitropism?

I. Statoliths will accumulate on the lower side of cells due to gravity
II. PIN3 transporter proteins will distribute to the upper side of the root
III. High concentration of auxin on the upper side of the root will inhibit cell elongation
IV. Cells elongate at a higher rate at the lower side of the root

A. I only

B. I and II only

C. I, III and IV

D. II, III and IV

[1 mark]

Question 8

Microarrays have provided more advanced opportunities for scientists to understand plant growth responses.

What has been the greatest advantage of using microarrays in this field of study?

A. It provides a visible way to determine the concentration of plant growth substances in certain cells

B. Predictions can be made regarding the expression of certain genes in different plant species

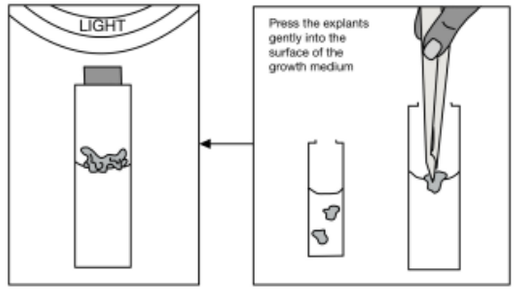
C. It provides a visible way to determine the level of gene expression in certain cells

D. The distribution of plant growth substance levels can be determined in different parts of the plant

[1 mark]

Question 9

The following diagram shows part of the process of micropropagation.



What property of the growth medium correctly describes how the explants will develop?

	Auxin : Cytokinin	Description of plant development
A	Greater than 10 : 1	The explant will develop shoots and begin to photosynthesise
B	1 : 1	Development of both roots and shoots will take place
C	Less than 10 : 1	The explant will develop roots and can be planted in soil
D	1 : 1	Develop into an undifferentiated group of cells called a callus

[1 mark]

Question 10

Which of the following would **not** be considered an application of micropropagation?

A. Producing many copies of new varieties of endangered plant species to allow for replanting in the wild

B. Producing strains of existing plant varieties that are free from viral, fungal and bacterial infections

C. Creating new varieties of endangered plant species to allow for replanting in the wild

D. Preserving favourable characteristics in commercially valuable plant species

[1 mark]