

9.4 Reproduction in Plants

Question Paper

Course	DP IB Biology
Section	9. Plant Biology (HL Only)
Topic	9.4 Reproduction in Plants
Difficulty	Easy

Time allowed: 60
Score: /49
Percentage: /100

Question 1a

a)
State the name of the phase of a plant's life in which it may be reproducing asexually but not sexually.

[1 mark]

[1 mark]

Question 1b

b)
Describe the process that takes place in the shoot apical meristem when a flowering plant enters the reproductive stage.

[2 marks]

[2 marks]

Question 1c

c)
State the name of the type of pigment in the leaf that plays a role in detecting ambient light levels.

[1 mark]

[1 mark]

Question 1d

d)
The response of plants to a stimulus like night length causes levels of transcription factors to alter within the plant cells' nuclei.

Define the term transcription factor in this context.

[2 marks]

[2 marks]

Question 2a

a)

Explain why active phytochrome (P_{fr}) is more present towards the end of the day in the leaves of short-day flowering plants.

[2 marks]

[2 marks]

Question 2b

b)

State **two** possible benefits to humans of being able to manipulate the flowering times of plants.

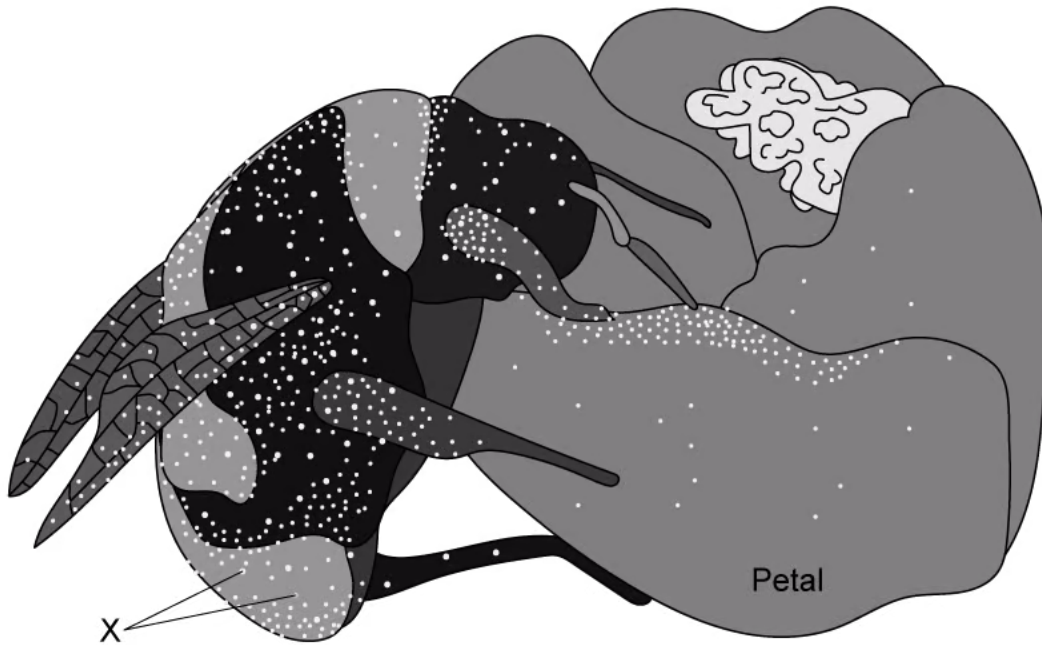
[2 marks]

[2 marks]

Question 2c

c)
The image below shows a bee feeding on nectar from a flower.

(i) Identify the small specks indicated **X**.



[1 mark]

(ii) Explain how the flower benefits from feeding nectar to insects such as bees.

[2 marks]

[3 marks]

Question 2d

d)
State the name of the type of relationship that exists between the bee and the flower in part c) of this question.

[1 mark]

[1 mark]

Question 3a

a)

Gregor Mendel's landmark experiments on the basis of genetic inheritance, involved the flowering plant the sweet pea (*Lathyrus odoratus*). In these experiments, Mendel transferred the male sexual organs of certain plants to the female sexual organs of separate plants as a way of performing crosses.

Before completing the transfer, he cut away the male sexual organs of the recipient plants before the transfer.

Explain why.

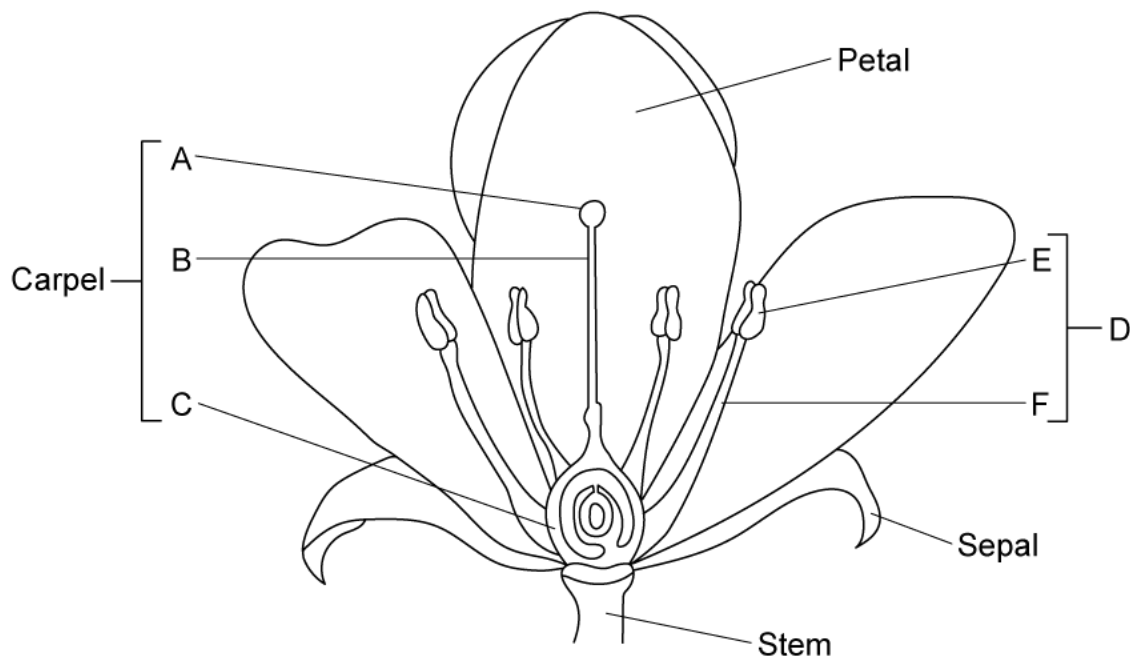
[2 marks]

[2 marks]

Question 3b

b)

The image below shows a flower.



Label the parts **A – F** indicated.

[6 marks]

[6 marks]**Question 3c**

c)

State the name of the part of the flower shown in part b) that receives pollen during sexual reproduction.

[1 mark]**[1 mark]****Question 3d**

d)

State the principal purpose of the:

(i) Petals

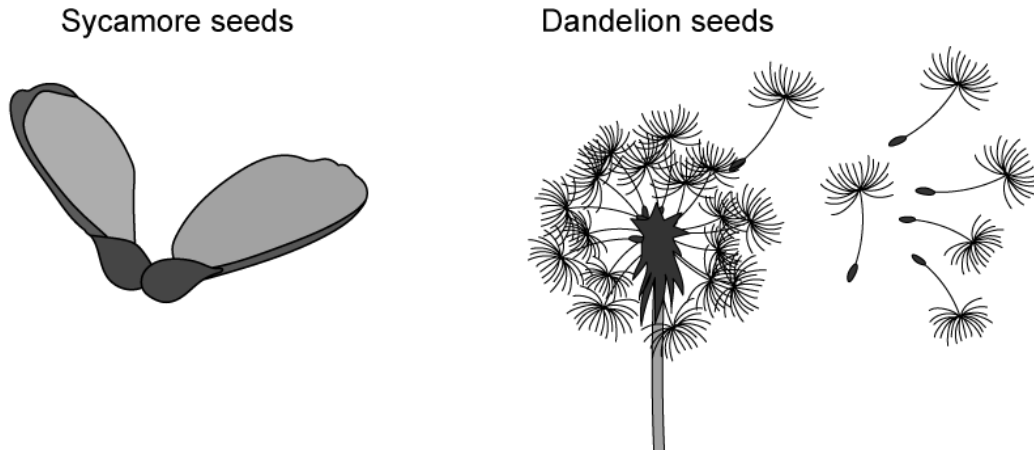
(ii) Sepal

[2 marks]**[2 marks]**

Question 4a

a)

The diagram below shows two types of seed; sycamore and dandelion.



State the method by which these seeds are dispersed and in each case, **one** adaptation of the seed that allows effective dispersal.

[3 marks]

[3 marks]

Question 4b

b)

Seeds such as those shown in part a) are more effective if they can be dispersed far away from the parent plant.

Explain why.

[2 marks]

[2 marks]

Question 4c

c)

The coco de mer is a seed that comes from a type of palm tree native to the Seychelles. *Lodoicea maldivica* is the species that produces the largest seeds known in nature. One such seed was found that had a mass of 25kg. To show the scale, a coco de mer seed is pictured below in the hands of a human.



Suggest why some plants like the dandelion and sycamore have small, lightweight seeds whereas others produce huge seeds like the coco de mer.

[2 marks]

[2 marks]

Question 4d

d)

Describe how seeds found in fruit such as apple pips are dispersed.

[2 marks]

[2 marks]

Question 5a

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

a)

Outline the relationship between levels of inactive phytochrome (P_r) and active phytochrome (P_{fr}) in long-day flowering plants.

[4 marks]

[4 marks]

Question 5b

b)

Draw a labelled diagram of a seed in cross-section.

A suggested example is a bean seed such as the common bean, aka French bean.

[6 marks]

[6 marks]

Question 5c

c)
Farmers and landowners are being encouraged to plant hedgerows and grow wildflower meadows amongst their productive crop-bearing farmland.

Explain why.

[5 marks]

[5 marks]