9.4 Reproduction in Plants

Question Paper

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

Time allowed: 60

Score: /45

Percentage: /100

Question 1a

a)
The life cycle of a flower involves a vegetative phase, during which the plant may be able to reproduce asexually, and a reproductive phase, during which sexual reproduction is possible.

Contrast asexual and sexual reproduction.

[2 marks]

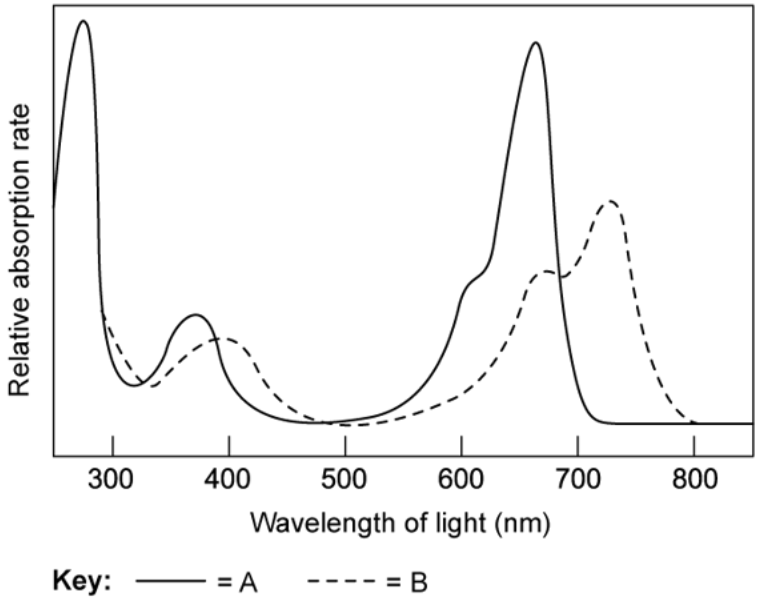
Question 1b

b)
Explain the importance of the length of the night in controlling flowering in plants.

[2 marks]

Question 1c

c)
The following graph illustrates the relative absorption rate of two important pigments (**A** and **B**) that control flowering in plants.



Identify, with reasons, pigments **A** and **B.**

[2 marks]

Question 1d

d)
Describe the conversion between pigment **A** and **B** that would take place over the course of 24 hours.

[2 marks]

Question 2a

a)
Poinsettias are short-day plants that are popular in Christmas floral decorations.

State how poinsettias can be induced to flower in the Southern Hemisphere where it will be summer at Christmas time.

[1 mark]

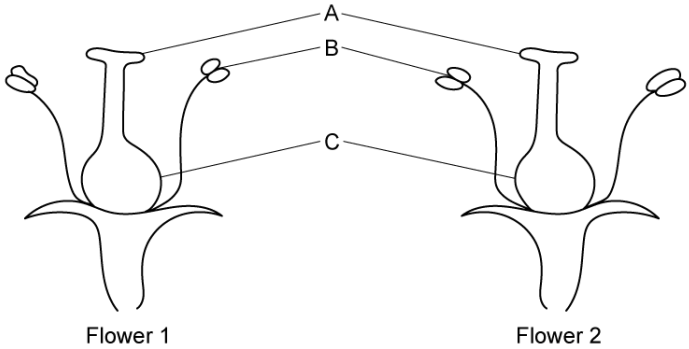
Question 2b

b)
Explain why the relationship between flowering plants and pollinators can be considered mutualistic.

[2 marks]

Question 2c

c)
The following diagram shows the reproductive parts of two flowers of the same species.



Identify structures **A** to **C** and state how each contributes to the process of sexual reproduction in the plant.

[3 marks]

Question 3a

a)
Pollination is the first step in sexual reproduction in plants.

Describe the events that occur after a pollen grain lands on the stigma of a flower until fertilisation happens.

[3 marks]

Question 3b

b)
The following table shows the number of honey bee colonies documented by a beekeeper on a farm from 2008 to 2018.

Year	Number of living colonies
2008	36
2010	34
2012	22
2014	23
2016	27
2018	21

Calculate the percentage decrease in bee colonies from 2008 to 2018.

[2 marks]

Question 3c

c)
Describe the impacts that a decline in pollinators would have on the wider ecosystem.

[3 marks]

Question 4a

a)
Draw a labelled diagram of the internal structure of a dicotyledonous seed.

[4 marks]

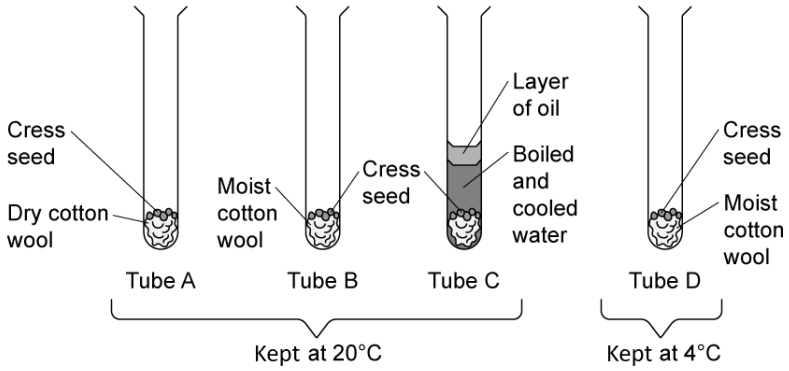
Question 4b

b)
State the main function of gibberellin in enabling seed germination.

[1 mark]

Question 4c

c)
The following investigation was set up to determine the conditions needed for germination.



Identify the control in this experiment and explain the importance of including this test tube in the investigation.

[2 marks]

Question 4d

d)
Explain why no seeds would germinate if test tube **D** from the investigation at c) was placed in an environment with a temperature of 45°C.

[1 mark]

Question 5a

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

a)
Outline the role of phytochrome in controlling flowering in long day plants.

[7 marks]

Question 5b

b)
Outline the adaptations of seeds with different methods of seed dispersal in flowering plants.

[3 marks]

Question 5c

c)
State and explain the factors that growers must consider when growing crops in order to maximise crop yield.

[5 marks]