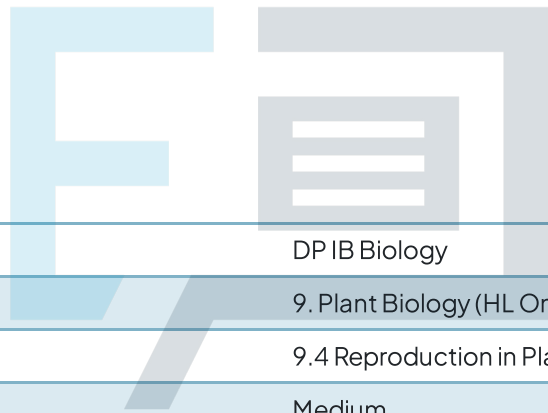




9.4 Reproduction in Plants

Mark Schemes



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

Exam Papers Practice

To be used by all students preparing for DP IB Biology HL
Students of other boards may also find this useful

1

The correct answer is **D**.

It is the concentration of **active** phytochrome, or P_{FR} that controls flowering rather than phytochrome in general.

2

The correct answer is **C**.

In short day plants, high levels of P_{FR} **inhibit** flowering. Levels of P_{FR} are **low** when nights are **longer than a critical length** (note that when day length is shorter, nights are longer), due to the slow conversion of P_{FR} back into P_R , so there is **no inhibition** of flowering and short day plants **flower**; as seen in the graph at the point marked **X**

3

The correct answer is **D**.

In long day plants, high levels of P_{FR} **activate** flowering. When the dark period is shorter, the rate at which P_R is converted into P_{FR} is greater than the rate at which P_{FR} is converted back into P_R , so P_{FR} levels are high. Providing periods of light during the night therefore raises P_{FR} levels and so can induce flowering in long day plants in the winter.

4

The correct answer is **B**.

Plants and pollinators have **mutualistic** relationships, meaning that both members of the partnership benefit. The graph shows a **reduced overlap time** for plant flowering and pollinator activity, meaning that there will be fewer pollinators available while plants are flowering and fewer plants available when pollinators are active; this will have detrimental effects on **both** plants and pollinators.

5

The correct answer is **B**.

Statement III is incorrect as the consumption of fleshy fruits followed by egestion in another location is a mechanism of **seed dispersal**, not pollen transfer.

6

The correct answer is **B**.

The male nuclei travel down the pollen tube until they reach the ovary where they fuse with the female gamete to make a zygote. The male and female gametes are both haploid as they contain half of the DNA required for the formation of the zygote.

7

The correct answer is **D**.

- We cannot tell from this graph whether seeds dispersed closer to the tree were eaten by squirrels so **A** is incorrect
- **B** is incorrect because the data does not suggest that seeds further away from the tree were less successful in germination
- **C** is incorrect as the data is calculated by % success rate of the number of seeds dispersed so we cannot tell from the data how many seeds were found in the area, just the percentage that successfully germinated

8

The correct answer is **A**.

Some seeds have an endosperm instead of cotyledons, however, whilst the cotyledons become the first leaves of the seedling, the endosperm does not. The radical and plumule have the correct descriptions next to them but these are not labelled in the diagram.

9

The correct answer is **D**.

10

The correct answer is **B**.

Enzyme controlled reactions are affected by temperature changes and if temperatures are too high then this could reduce germination success due to denaturing of enzymes. **Statement III** is not correct as seeds soaked at 20 °C and 25 °C were equally successful in their germination when germinated at 20 °C but there was a difference when germinated at 35 °C as seeds that had been soaked in the higher temperature germinated less successfully.



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