

Sexual reproduction in plants: practice questions

7 questions • 26 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 26

1 Which statement describes pollination? [1 mark]

- A. ☐ The fusion of a pollen nucleus with a nucleus in an ovule
- B. ☐ The transfer of pollen grains from an anther to a stigma
- C. ☐ The growth of a seed into a new plant
- D. ☐ The production of pollen in an ovary

2 Name the part of an insect-pollinated flower that: (a) produces pollen grains [1] (b) receives pollen grains [1] (c) contains the ovules [1] (d) protects the flower when it is in the bud. [1] [4 marks]

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3 The table gives information about two pollen grains, X and Y. One is from an insect-pollinated flower and one is from a wind-pollinated flower. (a) Which pollen grain, X or Y, is from the wind-pollinated flower? [1] (b) Give one reason for your answer. [1] (c) Suggest why wind-pollinated flowers make much more pollen than insect-pollinated flowers. [1] [3 marks]

Two pollen grains		
Pollen grain	Diameter / μm	Surface
X	35	Smooth
Y	90	Covered in spikes

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4 A grass flower is pollinated by wind. Describe and explain how the anthers and the stigmas of the flower are adapted for wind pollination. **[4 marks]**

5 **Supplement** **[4 marks]**
Describe what happens from the time a pollen grain lands on a stigma until fertilisation takes place.

6 **Supplement** **[5 marks]**
(a) Describe the difference between self-pollination and cross-pollination. [2] (b) Discuss the possible effects of cross-pollination, compared with self-pollination, on a population of plants. [3]

- 7** A student investigated the conditions needed for seeds to germinate. She set up four tubes, each containing 20 mustard seeds, and left them in the dark for five days. (a) State which tube is the control. [1] (b) Explain what the results show about the conditions needed for germination. [3] (c) Explain why the water in tube C was boiled and cooled before it was used. [1] **[5 marks]**

Germination investigation		
Tube	Conditions	number of seeds germinated
A	Damp cotton wool, air, 20 °C, dark	19
B	Dry cotton wool, air, 20 °C, dark	0
C	Seeds covered with boiled, cooled water and a layer of oil, 20 °C, dark	0
D	Damp cotton wool, air, 4 °C, dark (fridge)	0

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [4]

- (a) anther (1) allow stamen
- (b) stigma (1)
- (c) ovary (1) allow carpel
- (d) sepal(s) (1)

3. [3]

- (a) X (1)
- (b) smaller / lighter / smooth surface (1) allow carried easily by the wind
- (c) pollen is carried randomly by the wind / most pollen does not land on a stigma (of the same species) (1) ignore 'to make sure pollination happens' unqualified

4. [4]

- anthers hang outside the flower / on long filaments (1)
- so the wind can blow the pollen away (1)
- stigmas are large / feathery / hang outside the flower (1)
- to catch pollen grains from the air / give a large surface area (1)

5. [4] **Supplement**

- pollen tube grows from the pollen grain (1)
- down through the style (1)
- towards the ovary and enters the ovule (1) allow through the micropyle
- pollen nucleus fuses with the nucleus of the egg cell / nucleus in the ovule (1) allow male gamete fuses with female gamete
- Max 4

6. [5] **Supplement**

- (a) self-pollination: pollen moves to a stigma of the same flower or another flower on the same plant (1)
- cross-pollination: pollen moves to a stigma of a flower on a different plant of the same species (1)
- (b) cross-pollination gives more variation (in the offspring) (1)
- so the population is better able to respond to / survive a change in the environment (1) allow some will survive a new disease
- but it relies on pollinators / insects or wind, so fewer seeds may be made if pollinators are scarce (1) allow self-pollination is less reliant on pollinators

7. [5]

- (a) A (1)
- (b) water is needed: B has no water and none germinated (1)
- oxygen is needed: boiling removes dissolved oxygen / the oil stops air entering in C and none germinated (1)
- a suitable (warm) temperature is needed: D is too cold and none germinated (1) allow low temperature stops germination
- (c) to remove dissolved oxygen (1) ignore cooled so the seeds are not killed / to keep the temperature the same