

**Question 24** (Answer: **A**)

- Pollination only delivers the pollen to the stigma – that is not fertilisation.
- The pollen tube then grows down through the style to the ovule.
- The male nucleus fuses with the egg nucleus inside the ovule, so fertilisation happens there.

**Question 24** (Answer: **A**)

- Pollen moving between flowers on *\*different\** plants is cross-pollination.
- Pollen moving within the same plant is self-pollination.
- So follow each arrow and see whether it starts and ends on the same plant.

**Question 27** (Answer: **D**)

- The two flowers are on *\*different\** plants, so both arrows shown are cross-pollination.
- Cross-pollination increases genetic variation in the offspring.
- It needs an external agent – wind or an insect – to carry the pollen between the plants.

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| 4(a)(i)  | <i>any three from:</i><br>scent ;<br>nectar ;<br>large / colourful, petals ;<br>pollen (as a source of food) ;<br><b>AVP</b> ;                                                                                                                                                                                                 |
| 4(a)(ii) | <i>any one from:</i><br>large ;<br>sticky / spiky / AW ;                                                                                                                                                                                                                                                                       |
| 4(b)     | <i>any two from:</i><br><i>(monocots have)</i><br>narrow / strap / long/AW, leaves ;<br>parallel (leaf) veins ;<br>scattered vascular, tissue / bundles, (in the stem) ;<br>hollow stems ;<br>petals in multiples of three ;<br>fibrous roots ;<br>one cotyledon ;<br>pollen grains have one pore or furrow ;<br><b>AVP</b> ;; |
| 4(c)     | filament labelled ;<br>sepal labelled ;<br>an ovule labelled ;                                                                                                                                                                                                                                                                 |

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| 4(d)      | <i>any five from:</i><br><b>1</b> pollen (released) from the anther ;<br><b>2</b> pollen transferred to stigma ;<br><b>3</b> <u>pollen tube</u> , grows ;<br><b>4</b> (pollen tube goes) down / through, the style ;<br><b>5</b> ref. to ovule / ovary ;<br><b>6</b> pollen / male, nucleus travels down the (pollen) tube / style ;<br><b>7</b> pollen / male, and, ovule / female, <u>nuclei</u> fuse ;<br><b>8</b> fertilisation ;<br><b>9</b> <b>AVP</b> ; |
| 4(e)(i)   | sperm (cell) ;                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4(e)(ii)  | testis / testes ;                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4(e)(iii) | meiosis ;                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4(e)(iv)  | make fluid / semen, for the sperm / male gametes, to swim / AW ;                                                                                                                                                                                                                                                                                                                                                                                               |

**Question 29** (Answer: **A**)

- Cross-pollination means the pollen ends up on a \*different plant\*.
- So pollen from the anther of one plant reaches the stigma of another plant of the same species.
- A different flower on the \*same\* plant would still be self-pollination.

**Question 28** (Answer: **D**)

- Self-pollination uses pollen from the same plant, so it \*reduces\* variation.
- Less variation means the population is less able to adapt to a change in the environment.
- Cross-pollination increases variation, which is the advantage it brings.

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| 3(a)(i)  | <u>pollen tube</u> ;                                                                                                                                                                                                                                                                                                               |
| 3(a)(ii) | <i>any three from:</i><br>pollen tube grows / AW (and enters ovule / ovary) ;<br>pollen / male, nucleus travels down (pollen) tube / style ;<br>(pollen and ovule) nuclei fuse ;<br><i>ref. to ovule</i> ;                                                                                                                         |
| 3(b)(i)  | <i>any three from:</i><br>1 lack of (named) pollinators ;<br>2 <i>idea that</i> plant is isolated / AW ;<br>3 uses less, pollen / energy ;<br>4 increased chance of, fertilisation / pollination / offspring ;<br>5 <i>idea of</i> (less genetic diversity is) beneficial if plant is well-adapted to its environment ;<br>6 AVP ; |
| 3(b)(ii) | <i>any three from:</i><br>1 less / no, genetic variation ;<br>2 less likely to, survive / adapt to, changes in the environment ;<br>3 less resilience against disease / disease spreads more quickly ;<br>4 (increased risk of) extinction ;<br>5 <i>ref. to likelihood of</i> genetic disease ;                                   |
| 3(c)     | <i>any two from:</i><br>mutation ;<br>random, mating / pollination ;<br>random fertilisation ;<br>AVP ;                                                                                                                                                                                                                            |
| 3(d)     | <i>any four from:</i><br>1 <i>ref. to</i> nuclear division ;<br>2 production of genetically identical cells ;<br>3 (copies of / replicated) chromosomes separate ;<br>4 chromosome number is maintained (in each daughter cell) / AW ;<br>5,6 named roles of mitosis ;;                                                            |
| 3(e)     | stem (cells) ;                                                                                                                                                                                                                                                                                                                     |

**Question 25** (Answer: B)

- Self-pollination means the pollen reaches a stigma on the \*same plant\*.
- That includes a different flower on the same plant, since the genes are identical.
- Cross-pollination requires a flower on a \*different\* plant of the same species.