

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.

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

4(d)	<i>any five from:</i> 1 pollen (released) from the anther ; 2 pollen transferred to stigma ; 3 pollen tube, grows ; 4 (pollen tube goes) down / through, the style ; 5 ref. to ovule / ovary ; 6 pollen / male, nucleus travels down the (pollen) tube / style ; 7 pollen / male, and, ovule / female, <u>nuclei</u> fuse ; 8 fertilisation ; 9 AVP ;
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.

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