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AI-Generated Quiz

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Questions and Answers

Q1: As a seed matures, its water content is reduced, the embryo's metabolic activity slows down, and the embryo may enter a state of dormancy unless conditions for germination are favorable.

A1: True

Explanation: When seeds mature they lose much of their water (often to about 10?15% moisture), which lowers the biochemical and enzymatic activity of the embryo so its overall metabolism slows. This low-metabolic state can lead the embryo into dormancy?a temporary inactivity that prevents germination until external requirements (adequate moisture, oxygen and suitable temperature) are met. Dehydration and dormancy also make seeds suitable for storage and delayed germination.

Q2: In the diagram, which description correctly matches the typical anther shown?

A) Bilobed with one microsporangium in each lobe
B) Unilobed with four microsporangia in a single lobe
C) Bilobed and tetrasporangiate with two microsporangia in each lobe
D) Bilobed with three microsporangia in each lobe

A2: Bilobed and tetrasporangiate with two microsporangia in each lobe

Explanation: A typical anther has two lobes (bilobed) and is tetrasporangiate, meaning it contains four microsporangia in total. Those four microsporangia are organised as two microsporangia in each lobe (each lobe = a theca). Distractors are wrong because: (1) one microsporangium per lobe would give only two microsporangia total, not the four that make an anther tetrasporangiate; (2) a unilobed anther with all four microsporangia in one lobe contradicts the defining bilobed structure; (3) three microsporangia per lobe implies six total and does not match the tetrasporangiate (four-sporangia) condition.

Q3: Which pair correctly describes the two fusions that constitute double fertilization in angiosperms?

A) Both syngamy and triple fusion produce diploid nuclei
B) Syngamy forms the diploid zygote, and triple fusion forms the triploid primary endosperm nucleus
C) Syngamy forms the triploid endosperm and triple fusion forms the diploid zygote
D) A single male gamete fuses with both the egg and the polar nuclei to form the zygote and endosperm

A3: Syngamy forms the diploid zygote, and triple fusion forms the triploid primary endosperm nucleus

Explanation: In angiosperms double fertilization involves two distinct fusions: syngamy (fusion of one male gamete with the egg) produces the diploid zygote (2n), while triple fusion (fusion of the other male gamete with the two polar nuclei) produces the triploid primary endosperm nucleus (3n). Distractors are incorrect because: (1) swapping the outcomes reverses the roles of syngamy and triple fusion; (2) triple fusion yields a triploid nucleus, not a diploid one

Q4: Which sequence correctly describes microsporogenesis inside an anther?

A) Meiosis producing one functional microspore and three degenerate microspores
B) Meiosis of a pollen mother cell producing a tetrad of four haploid microspores that later separate as the anther matures and dehydrates
C) Microspores are formed by cell divisions in the tapetum layer and then develop into pollen grains
D) Mitosis of a pollen mother cell producing four haploid microspores that later separate

A4: Meiosis of a pollen mother cell producing a tetrad of four haploid microspores that later separate as the anther matures and dehydrates

Explanation: Microsporogenesis involves a diploid pollen (microspore) mother cell (PMC) undergoing meiosis to yield a tetrad of four haploid microspores; as the anther matures and dehydrates these microspores dissociate and develop into pollen grains. Distractors are incorrect because: (1) mitosis of the PMC would not reduce chromosome number and is not the meiotic process that produces haploid spores; (2) formation of one functional and three degenerate spores describes megasporogenesis (female), not microsporogenesis; (3) the tapetum is a nutritive/secretory layer that supports spore development (for example secreting sporopollenin) but microspores themselves arise by meiosis of sporogenous cells, not by divisions in the tapetum.

Q5: Which statement correctly contrasts xenogamy and autogamy?

A) Xenogamy is transfer of pollen between flowers on different plants of the same species; autogamy occurs within the same flower
B) Xenogamy is transfer of pollen within the same flower
C) Autogamy always requires pollinators and never occurs in closed (cleistogamous) flowers
D) Autogamy is transfer of pollen between flowers on different plants of the same species

A5: Xenogamy is transfer of pollen between flowers on different plants of the same species; autogamy occurs within the same flower

Explanation: Autogamy is self-pollination within the same flower or plant; xenogamy is cross-pollination between flowers on different plants of the same species, and is the only type that is genetically different (produces genetically cross progeny). Distractors are wrong because: (1) swapping the definitions reverses the distinct source/target plants and is incorrect; (2) xenogamy by definition involves different plants, not within a single flower; (3) autogamy often does not need pollinators (e.g., cleistogamous flowers self-pollinate without pollinators), so saying it always requires pollinators is false.

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