CLASS 11 BIOLOGY EXTRA QUESTIONS

Class 11 Biology Chapter 3 Plant Kingdom – Extra Questions with Answers

Extra practice questions for Class 11 Biology Chapter 3 (Plant Kingdom), beyond the textbook. These Class 11 Biology Chapter 3 important questions are handy for last-minute exam practice.

Contents

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Very Short Answer Questions (1 mark)

Q1. Name the pigment that gives brown algae their colour.
Ans: Fucoxanthin.

Q2. Which group of plants is called "amphibians of the plant kingdom"?
Ans: Bryophytes.

Q3. What are the two main groups of angiosperms?
Ans: Monocotyledons and dicotyledons.

Q4. Give an example of a gymnosperm.
Ans: Pinus (or Cycas).

Q5. Which plant group was the first to develop true vascular tissue?
Ans: Pteridophytes.

Short Answer Questions (2–3 marks)

Q6. Differentiate between gametophyte and sporophyte generations.
Ans: Gametophyte is the haploid (n) generation that produces gametes by mitosis; sporophyte is the diploid (2n) generation that produces spores by meiosis.

Q7. List the three classes of algae with one distinguishing pigment for each.
Ans: Chlorophyceae (chlorophyll a+b, green), Phaeophyceae (fucoxanthin, brown), Rhodophyceae (r-phycoerythrin, red).

Q8. Why do bryophytes and pteridophytes both require water for fertilization?
Ans: Their motile, flagellated male gametes (antherozoids) must swim through a film of water to reach the female gamete (egg) for fertilization, similar to animal sperm requiring a fluid medium.

Higher-Order Thinking / Application Questions

Q9. Explain, using the concept of alternation of generations, why the evolutionary trend across bryophytes, pteridophytes, gymnosperms, and angiosperms shows an increasing dominance of the sporophyte generation over the gametophyte generation, and why this trend is considered evolutionarily advantageous.
Ans: In bryophytes, the gametophyte is the dominant, independent, photosynthetic phase, while the sporophyte is small, short-lived, and dependent on the gametophyte for nutrition. Moving to pteridophytes, the sporophyte becomes the dominant, independent phase (the visible fern plant, for example), while the gametophyte (prothallus) becomes small and short-lived. This trend continues and intensifies in gymnosperms and angiosperms, where the gametophyte is reduced to just a few cells (e.g. the pollen grain and embryo sac) that are entirely dependent on and protected within the dominant sporophyte plant body. This shift is evolutionarily advantageous because the diploid sporophyte, having two copies of each gene, offers greater genetic buffering against harmful mutations (a harmful recessive allele can be masked by a normal dominant allele), and a larger, more complex, well-protected sporophyte body (with vascular tissue, cuticle, stomata, and eventually seeds) is much better adapted to survive and reproduce successfully in diverse, often dry, terrestrial environments compared to the more vulnerable, water-dependent

gametophyte phase.

Q10. Explain why the development of the seed habit in gymnosperms and angiosperms is considered one of the most significant evolutionary advancements in the plant kingdom, connecting this to the challenges faced by pteridophytes in reproduction.
Ans: Pteridophytes (like ferns), despite having vascular tissue that allows them to grow larger and transport water/nutrients efficiently, are still fundamentally limited in colonizing dry terrestrial habitats because their fertilization process absolutely requires a film of external water for the motile sperm to swim to the egg, and their delicate, exposed spores and gametophytes are highly vulnerable to desiccation, providing little protection or nutrition for the developing embryo. The evolution of the seed habit in gymnosperms and angiosperms solved these problems: pollen grains (male gametophytes) no longer require external water to reach the female gametophyte, since they can be transported by wind or animals directly to the ovule (often through pollen tubes that carry non-motile sperm nuclei directly to the egg), removing dependence on external water for fertilization. Furthermore, the resulting seed provides the developing embryo with a protective outer coat (seed coat) and a store of nutrition (endosperm or cotyledons), allowing it to remain dormant and survive unfavourable conditions (drought, cold) until suitable conditions for germination arise. This combination of water-independent fertilization and a protected, nourished, dormancy-capable embryo is what allowed seed plants to become far more successful and dominant in colonizing diverse and often dry terrestrial environments compared to spore-dependent pteridophytes.

Class 11 Biology Chapter 3 – Solutions and Notes

For complete step-by-step answers and a quick summary, check the Class 11 Biology Chapter 3 Solutions and Class 11 Biology Chapter 3 Revision Notes.

See also: Chapter 1 | Chapter 2 | Chapter 3

Practice more: Chapter 1 | Chapter 2

Quick revision: Chapter 1 | Chapter 2