



Attempt questions first; check the separate key afterward. Use labelled diagrams where asked. Give scientific reasons; answer key covers closed questions.

A. Very short answers - 1 mark each

1. Name the innermost anther-wall layer.
2. Name the resistant material of pollen exine.
3. What is the ploidy of a microspore?
4. How many nuclei occur in a typical mature Polygonum-type embryo sac?
5. How many cells occur in that mature embryo sac?
6. Name the synergid structure guiding pollen-tube entry.
7. What is the usual ploidy of primary endosperm nucleus?
8. What is fruit formation without fertilisation called?

B. Short answers / practice - 2 marks each

9. Describe a typical anther in transverse section.
10. Explain microsporogenesis and pollen-grain development.
11. Compare vegetative and generative cells in pollen.
12. Why can pollen be stored in liquid nitrogen?
13. Draw an anatropous ovule and label its parts.
14. Explain megasporogenesis and monosporic embryo-sac development.
15. Distinguish autogamy, geitonogamy and xenogamy.
16. Why is geitonogamy genetically similar to self-pollination?
17. Compare adaptations for wind and animal pollination.
18. Explain how cleistogamy ensures seed set.
19. Describe outbreeding devices in flowering plants.

20. Explain pollen-pistil interaction and self-incompatibility.

C. Application / reasoning - 3 marks each

21. Define syngamy and triple fusion.
22. Why is double fertilisation distinctive in angiosperms?
23. Compare free-nuclear and cellular endosperm development.
24. Trace dicot embryo development from zygote.
25. Distinguish epicotyl, hypocotyl, plumule and radicle.
26. Compare albuminous and non-albuminous mature seeds.
27. Explain apomixis and its significance in hybrid-seed production.
28. Distinguish polyembryony from apomixis.
29. How many microspore mother cells produce 200 pollen grains ideally?
30. How many meioses are minimally needed for 100 pollen grains and 100 functional embryo sacs in the usual monosporic type?
31. If a plant has $2n=24$, find chromosome counts in egg, zygote and typical endosperm.

D. Extended practice - 5 marks each

32. Describe anther and female-gametophyte development with labelled diagrams.
33. Explain double fertilisation and post-fertilisation changes in ovule and ovary.
34. Describe artificial hybridisation, including emasculation, bagging and pollination.
35. Compare apomixis, parthenocarpy and polyembryony with examples and agricultural significance.

ANSWER KEY - Numerical / closed questions

- 1) Tapetum. 2) Sporopollenin. 3) Haploid. 4) Eight. 5) Seven. 6) Filiform apparatus. 7) Triploid. 8) Parthenocarpy. 29) Fifty. 30) 125 meioses. 31) 12, 24, 36.