

7. Which outbreeding device prevents both autogamy and geitonogamy?

- A. Monoecy
- B. Dioecy
- C. Self-incompatibility only
- D. Cleistogamy

8. Which seed is correctly classified as albuminous according to the study material?

- A. Pea albuminous according to the study
- B. Peanut
- C. Groundnut
- D. Cleistogamy

Part B – True or False (6)

9. All four megaspores formed during megasporogenesis develop into embryo sacs.
10. The germ pore is the region where the exine is absent, allowing the pollen tube to emerge.
11. Cleistogamous flowers guarantee seed formation even without pollinating agents.
12. Endosperm usually develops before the embryo.

Answer Key

Part A: Multiple Choice

Q. No.	Answer
1	B
2	B
3	C
4	C
5	B
6	C
7	B
8	C

Part B: True / False

Q. No.	Answer
9	False
10	True
11	True
12	True
13	True
14	True

Suggested Answers – Short Answer Questions

15. Why the embryo sac is 7-celled but 8-nucleate

The mature embryo sac contains 7 cells and 8 nuclei:

- **Micropylar end:** 1 egg cell + 2 synergids (egg apparatus)
- **Central cell:** Contains 2 polar nuclei
- **Chalazal end:** 3 antipodal cells

Although there are only 7 cells, the central cell contains two nuclei, making the embryo sac 8-nucleate.

16. Autogamy vs. Geitonogamy vs. Xenogamy

Type	Source of Pollen	Pollinating Agent	Genetic Outcome
Autogamy	Same flower	Usually not required	Self-pollination
Geitonogamy	Different flower, same plant	Required	Genetically self
Xenogamy	Different plant of same species	Required	True cross-pollination with genetic variation

17. Sequence of events in double fertilization

- Compatible pollen germinates on the stigma.
- A pollen tube grows through the style and enters the embryo sac via the micropyle.
- Guided by the filiform apparatus, it enters a synergid.
- One male gamete fuses with the egg cell (syngamy) to form the zygote (2n).
- The second male gamete fuses with the two polar nuclei (triple fusion) to form the Primary Endosperm Nucleus (3n).
- Together, these two fusion events constitute double fertilization, a defining feature of angiosperms.

18. Four adaptations of wind-pollinated flowers

- Light, small, non-sticky pollen grains for easy dispersal.
- Long, feathery stigma to trap airborne pollen.
- Well-exposed stamens for efficient pollen release.
- Flowers are small, odourless, nectarless, and inconspicuous since pollinators are unnecessary.

19. Importance of emasculation and bagging

- **Emasculation:** Removal of anthers before pollen release to prevent self-pollination in bisexual flowers.
- **Bagging:** Covering the flower to prevent contamination by unwanted pollen until controlled pollination is carried out.
- Emasculation is not required in unisexual female flowers because they naturally lack anthers.

20. Albuminous vs. Non-albuminous seeds

Albuminous Seeds

Non-albuminous Seeds

Endosperm persists in the mature seed.	Endosperm is completely consumed by the developing embryo.
Examples: Wheat, maize, castor, coconut.	Examples: Pea, bean, groundnut.

The difference arises because, during post-fertilization development, the embryo either utilizes all the endosperm before seed maturity (non-albuminous) or leaves part of it intact as a food reserve (albuminous).