A. Multiple Choice Questions (11)

Q1. In angiosperms, microsporogenesis leads to formation of:
a) Microspore mother cell
b) Pollen grains
c) Pollen mother cell
d) Microsporophyll

Q2. How many nuclei are present in a mature embryo sac?
a) 6
b) 7
c) 8
d) 4

Q3. Which cell in the embryo sac is diploid?
a) Egg cell
b) Central cell
c) Synergid
d) Antipodal cell

Q4. Which layer in an anther provides nourishment to developing pollen?
a) Tapetum
b) Endothecium
c) Epidermis
d) Middle layer

Q5. Which event leads to double fertilization in angiosperms?
a) Fusion of two male gametes
b) One male gamete fuses with egg, another with secondary nucleus
c) Two male gametes fuse with two synergids
d) Both sperm cells fuse with egg

Q6. Pollen grains retain viability for longest in:
a) Rice
b) Wheat
c) Date palm
d) Coconut

Q7. Pollination by water is called:
a) Entomophily
b) Hydrophily
c) Anemophily
d) Ornithophily

Q8. Which plant shows self-incompatibility?
a) Wheat
b) Brassica
c) Rice
d) Maize

Q9. In most angiosperms, pollination is:
a) Autogamy
b) Geitonogamy
c) Xenogamy
d) All of these

Q10. Which one produces both pollen grains and ovules?
a) Anther
b) Ovary
c) Flower
d) Ovule

Q11. The endosperm in angiosperms is formed by:
a) Syngamy
b) Triple fusion
c) Fertilization
d) Pollination

B. Assertion–Reasoning (5 Questions)

Q1. Assertion: Tapetum is nutritive in function.
Reason: Tapetum helps in development of pollen grains.

Q2. Assertion: Double fertilization is a characteristic feature of angiosperms.
Reason: One male gamete fuses with egg, the other with central cell.

Q3. Assertion: Synergids guide the pollen tube to the egg cell.
Reason: They have filiform apparatus.

Q4. Assertion: Endothecium layer helps in dehiscence of anther.
Reason: It shows hygroscopic nature.

Q5. Assertion: Pollination in Vallisneria is hydrophilous.
Reason: Pollen grains are heavy and sticky.

(Options: a) Both A & R true, R explains A b) Both A & R true, R does not explain A c) A true, R false d) A false, R true)

C. Case Study Question 1

Read the paragraph and answer the following questions:

The flowers of most angiosperms have both male and female reproductive organs, but mechanisms exist to prevent self-pollination and promote cross-pollination. In some species like wheat and rice, pollination occurs by wind, whereas in Vallisneria, pollination is carried out by water. Certain species show self-incompatibility, preventing pollen grains of the same plant from fertilizing the ovules.

Questions:
a) Name two adaptations in flowers for wind pollination.
b) Which mechanism in plants prevents autogamy?
c) What type of pollination occurs in Vallisneria?
d) Give one advantage of cross-pollination over self-pollination.

Case Study Question 2

Read the following passage and answer the questions:

In angiosperms, the process of double fertilization occurs inside the embryo sac. After pollen grains reach the stigma, they germinate to produce a pollen tube which carries two male gametes to the embryo sac. One male gamete fuses with the egg cell, while the other fuses with the two polar nuclei. This unique phenomenon ensures the formation of both zygote and endosperm.

Questions:
a) Why is double fertilization called a unique feature of angiosperms?
b) Name the two products of double fertilization and state their ploidy.
c) Which structure guides the pollen tube to the egg apparatus?
d) Mention the role of the second male gamete.

Application-Based Questions (2)

Q1. A pollen tube carrying two male gametes reaches the embryo sac. Explain the events that follow till zygote formation.

Q2. Why is fertilization in angiosperms called **double fertilization**? Explain its significance.