**DPT** **GATE XL (Botany)**

**"Development of Male and Female Gametophyte"**

**1. Multiple-Choice Question (MCQ - Single Correct)**

**Which of the following is the correct sequence of events in the development of the male gametophyte in angiosperms?**
(A) Microspore mother cell → Microspore → Pollen grain → Generative cell division
(B) Microspore mother cell → Pollen grain → Microspore → Generative cell division
(C) Pollen grain → Microspore → Microspore mother cell → Generative cell division
(D) Microspore mother cell → Pollen grain → Generative cell division → Microspore

✅ **Correct Answer:** (A) Microspore mother cell → Microspore → Pollen grain → Generative cell division

---

**2. Multiple-Choice Question (MCQ - Multiple Correct)**

**Which of the following statements about female gametophyte development in angiosperms are correct?**
(A) The functional megaspore undergoes mitotic divisions to form the embryo sac.
(B) The mature embryo sac is typically 8-celled and 7-nucleate.
(C) The antipodal cells are involved in double fertilization.
(D) The egg apparatus consists of the egg cell and two synergids.

✅ **Correct Answers:** (A) and (D)

---

**3. Numerical Answer Type (NAT)**

**In the Polygonum type of embryo sac development, how many mitotic divisions occur in the functional megaspore to form the mature female gametophyte?**

✅ **Correct Answer: 3**

---

**4. Assertion-Reason Type**

**Assertion (A):** The pollen grain is the immature male gametophyte in angiosperms.
**Reason (R):** The pollen tube is formed after the generative cell divides to form two sperm cells.

(A) Both A and R are true, and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

✅ **Correct Answer:** (B) Both A and R are true, but R is not the correct explanation of A.

---

**5. Match the Following**

Match the structures with their respective functions in the development of male and female gametophytes:

| **Structures (Column A)** | **Functions (Column B)** |
|---|---|
| Pollen tube | (i) Provides nutrition to the developing embryo sac |
| Synergids | (ii) Directs sperm cells to the egg |
| Tapetum | (iii) Forms the mature male gametophyte |
| Microspore | (iv) Carries sperm cells to the embryo sac |

✅ **Correct Answer:**

- Pollen tube → **(iv) Carries sperm cells to the embryo sac**
- Synergids → **(ii) Directs sperm cells to the egg**
- Tapetum → **(i) Provides nutrition to the developing embryo sac**
- Microspore → **(iii) Forms the mature male gametophyte**