

# ***Life Sciences, Grade 11, Biodiversity of Plants***

## **Written questions**

### **Question 1: Plant Classification and Structures**

1.1 **Vascular Tissue** refers to tissues (xylem and phloem) that transport water and nutrients in plants. A **Thallus** is a simple plant body structure, lacking true leaves, stems, or roots.

1.2 Non-vascular plants like mosses are anchored by **Rhizoids**. These are root-like structures whose function is solely to anchor the plant, not to absorb water and nutrients like true roots.

1.3 The **Gametophyte** is the haploid (n) generation in a plant's life cycle that produces gametes. In mosses, it is the dominant generation. The **Sporophyte** is the diploid (2n) generation that produces spores. In mosses, it is present for a short time and depends on the gametophyte for survival.

### **Question 2: Reproduction in Plants**

2.1 **Fragmentation** is a method of asexual reproduction where a small part of a plant breaks off and grows into a new, genetically identical individual.

2.2 In bryophyte reproduction, the **Antheridium** is the structure where male gametes (sperm) are produced. The **Archegonium** is the structure where female gametes (eggs) are produced and where the embryo (sporophyte) develops.

2.3 **Advantages of asexual reproduction:** \* Only one parent is needed. \* Offspring are genetically identical (clones), so if the parent is well adapted, the offspring will also be. \* Many offspring can be produced in a short period, allowing them to crowd out competition. \* No need to rely on pollination or dispersal agents. \* Can occur in any season.

**Disadvantages of asexual reproduction:** \* All offspring are genetically identical, so they may not survive if the environment changes. \* Weakness in the parent is transmitted to the offspring. \* Rapid growth can lead to overcrowding and increased competition for resources like space, water, and sunlight.

### **Question 3: Plant Adaptations and Pollination**

3.1 Plants that rely on wind for pollination often have small, green flowers with no scent or nectar because these features are not necessary to attract animal pollinators. Wind-pollinated flowers focus on producing large amounts of lightweight pollen that can be easily carried by air currents.

3.2 Two distinct adaptations of flowers pollinated by insects are: \* **Brightly colored petals:** These serve to visually attract insects to the flower. \* **Sweet scent and nectar:** The scent attracts insects, and the nectar provides a sugary reward, encouraging insects to visit and

transfer pollen. \* **Sticky pollen grains:** This ensures that pollen adheres to the insect's body for effective transfer.

3.3 **Advantages of sexual reproduction:** \* Offspring are genetically different (increased variance), which increases their chances of survival in changing environments. \* Allows for the crossing of organisms with desirable characteristics, potentially producing offspring with a better yield or improved traits. **Advantages of asexual reproduction:** \* Only one parent is needed. \* Offspring are clones, ensuring that desirable traits are passed on directly without genetic variation. \* Many offspring can be produced quickly.