Name _____

Specialized Tissues In Plants

I. Seed Plant Structure

1. **What are the three principal organs of seed plants?**

   1. Roots 2. Stems 3. Leaves

2. **Circle the letter of each sentence that is true about a function that roots perform.**

   a. They anchor plants into the ground
   b. They compete with other plants for sunlight.
   c. They absorb water and nutrients from the soil.
   d. They hold plants upright.

   (mm to 100 meters tall)

3. **What does the transport system of stems do?** It lifts water from the roots up to the leaves + sends products of photosynthesis from leaves to roots

4. Leaves **are the principal organs in which plants carry out photosynthesis.**

II. Plant Tissue Systems

1. **What are the three tissue systems of plants?**

   1. Dermal ("Skin") 2. Ground ("Everything else") 3. Vascular ("Bloodstream")

2. **Dermal tissue typically consists of a single layer of** epidermal **cells.**

"Forehead Demo"

3. **What is the cuticle, and what is its function?** Thick, outer waxy layer

   Function : Protects against water loss + injury

4. **What is the function of trichomes?** Help protect the leaf (Fuzzy)

5. **What do each type of vascular tissue transport?**

   Xylem : Water Phloem : Food

6. Ground **tissue are cells that lie between dermal and vascular tissue.**

III. Roots

1. **How are primary roots and secondary roots different in some plants?**

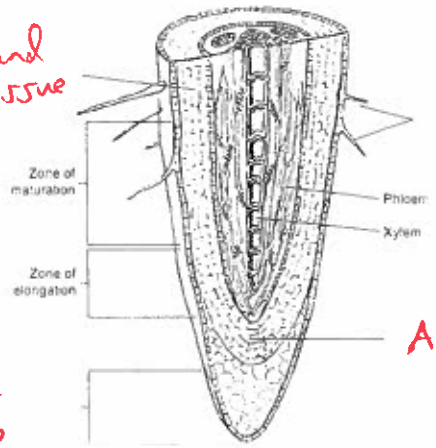
   Primary = grows long + thick / Secondary = small (root hairs)

2. **Complete the table about types of roots.**

Type Of Root	Description	Examples
Taproots	Long and thick primary roots that grow deep into the soil.	Oak, hickory trees, carrots, dandelions, beets, radishes
Fibrous Roots	Roots that are usually shallow and consist of many thin roots.	Grasses, Palm Trees, Corn

Name _____

3. **Label the parts of a root on the illustration.**



Ground Tissue

Root Hairs (large surface area to allow water to enter)

Apical Meristem

(Protects root as it forces way through soil) → Root Cap

4. **What are two functions of a plant's roots?**
   1. Anchors plant into ground (vertical or horizontal)
   2. Absorbs water + dissolved nutrients from soil
5. **What role does calcium play in a plant?** Growth + division of cells
6. **What results if a plant is deficient in nitrogen?** Stunted Growth / Pale Yellow Leaves

IV. Stems

1. **What are the two important functions of stems?**
   1. Hold leaves up to the sunlight
   2. Transport substances between roots + leaves
2. **What is primary growth in a plant?** Increase in plant length (caused by production of new cells at tips of roots + shoots)
3. **Define the term apical meristem.**

   Apical Meristem - tips that allow for primary growth of stems through cell division

4. **Primary growth of stems is produced by cell division in the apical meristem.**

   Circle One : True False

5. Secondary **growth is the pattern of growth in which stems increase in width.**
6. **What type of meristematic tissue increases the thickness of stems over time?**

   Vascular cambium

7. **What does the cork cambium produce?** outer covering of stems
8. **Most of what we call "wood" is actually layers of ~~phloem~~.** xylem

   Circle One : True False

9. Tree rings **are the alternation of dark & light wood.**

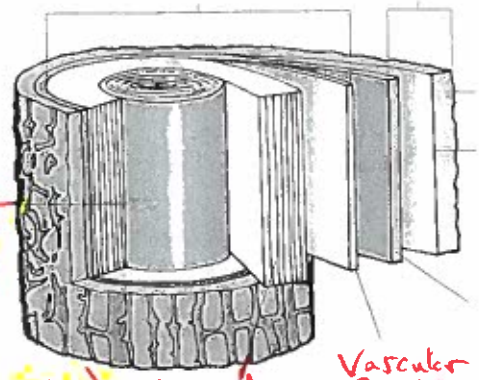
Name _____

10. How can you estimate the age of a tree? Count rings in cross-section

11. Circle the letter of each sentence that is true about cork.

a. Cork cells usually contain fats, oils, or waxes.
b. Cork cells cause the ~~loss~~ retention of water from a stem.
c. The outermost cork cells are usually dead.
d. Cork cambium produces a thick, protective layer of cork.

12. Label the parts of the illustration of wood.



13. What are four kinds of modified stems that store food?

1. Tuber (potato) 2. Bulb (amaryllis) 3. Rhizome (ginger) 4. Corm (gladiolus, crocus)

V. Leaves

1. The structure of a leaf is optimized for what purpose?

Absorbing light + carrying out photosynthesis

2. Mesophyll **is ground tissue that makes up the bulk of most leaves.**

3. Define the term stomata.

Stomata - openings on the underside of leaves (open + closed by guard cells)

4. What is transpiration? Water loss of a plant through leaves

"Holding Breath"

5. Why must a plant have its stomata open at least part of the time?

To allow for gas exchange (between mesophyll + exterior)

6. In general, stomata are closed at night.

Closed during hot dry periods

Circle One : True False (Photosynthesis activity = daytime)

7. How is the structure of leaves of a pine tree an adaptation to dry conditions?

Reduces water loss from the leaf

8. What are cactus leaves adapted for?

Stem = photosynthetic

Non-photosynthetic thorns that protect against herbivores

9. Why must carnivorous plants rely on insects for their source of nitrogen?

They live in nutrient-poor soils

(Venus Fly-Trap, Pitcher Plant, Sundew)