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Bio 221 – Concepts of Botany  
Dr. Hardy  
Exam 1 (Spring 2013)

Name: \_\_\_\_\_

Instructions:

- Please do not turn this page over until Prof. Hardy has instructed you to do so.
- You must hand in this question packet with your name on it at the end of the period with your scantron.
- Scantron answer bubbles should be completely filled in with a number 2 pencil.
- Start by filling in your complete last name and both first and middle name initials.
- Fill in your MU number in the Social Security number slot.
- Read ALL possible answers, then choose THE BEST single answer.
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**1. Lenticels and stomata function in gas exchange.**

- A. True B. False

**2. Retardation of water loss by cork cells is provided by**

- A. suberin.  
B. lignin.  
C. mucigel.  
D. stomata.

**3. Which is an important function of the secondarily thickened and lignified cell walls of tracheary elements such as tracheids and vessel elements?**

- A. mechanical support for the body of a plant.  
B. mechanical support to allow for tremendous negative pressures generated inside them.  
C. all of the above.

**4. Which “stem” axis sits above the cotyledons in a seedling?**

- A. the hypocotyl  
B. the epicotyl  
C. the plumule  
D. the radicle

**5. In a young seedling the part of the stem below the cotyledons is called the**

- A. epicotyl.  
B. hypocotyl.  
C. plumule.  
D. radicle.  
E. coleoptile.

**6. Commercially, cotton fibers are removed from seeds by the process of ...**

- A. Retting B. Decortication C. Ginning.

**7. Flax fibers are...**

- A. Leaf fibers  
B. Bast fibers  
C. Surface or seed fibers  
D. Synthetic fibers  
E. Synonymous with wool

**8. Which best describes the leaf or leaves below?**

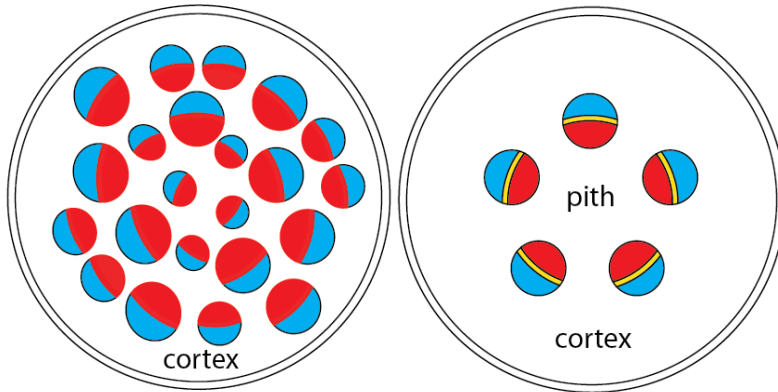
- a. simple b. pinnate c. 2-pinnate (bipinnate) d. 3-pinnate (tripinnate) e. palmate



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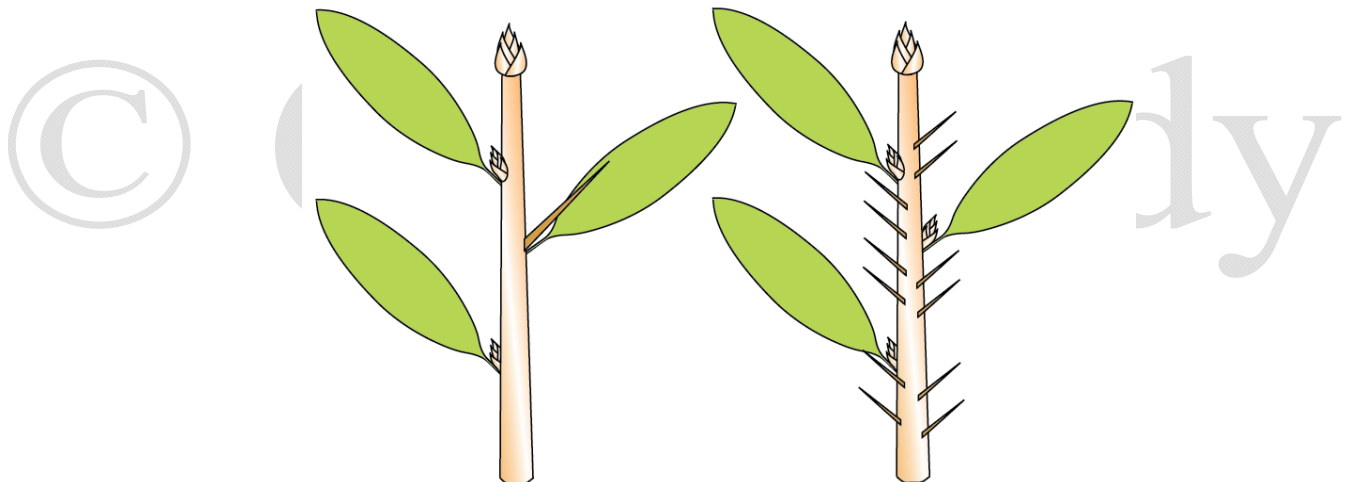
**9. The pictures below depict....**

- A. a root cross-section from a dicot (left) and monocot (right).
- B. a root cross-section from a monocot (left) and dicot (right).
- C. a stem cross-section from a dicot (left) and monocot (right).
- D. a stem cross-section from a monocot (left) and dicot (right).
- E. a leaf cross-section from a monocot (left) and a dicot (right).



**10. Which of the following is not represented below?**

- a. prickles
- b. thorns
- c. spines



**11. How were the Chamorro getting dangerous levels of BMAA into their system?**

- A. they were unknowingly inhaling cycad pollen
- B. they were eating *fadang*, a flatbread made from cycad leaves.
- C. they were eating *fadang*, a flatbread made from cycad seeds.
- D. they were eating the leaves of an unknown plant that grew next to the cycads
- E. they were eating bats

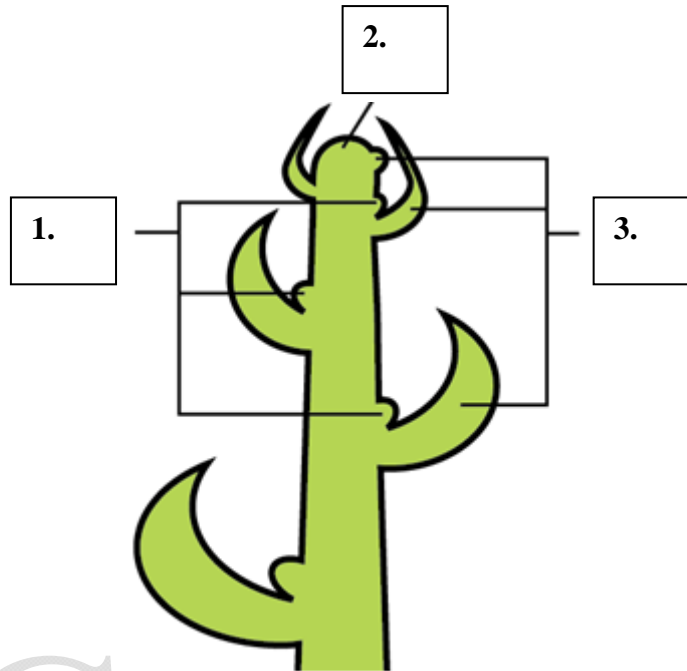
**12. The types of gymnosperms most frequently stolen or poached and sold on the black market are..**

- A. Lycopods
- B. Conifers
- C. Cycads
- D. Ginkgos
- E. Horsetails

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**13. What are the structure(s) labeled by "1" below?**

- A. Apical meristem
- B. Bud primordia
- C. Leaf primordia
- D. Stem primordia
- E. Adventitious roots



**Questions 14-16, refer to below, right**

**14. Phyllotaxy is...**

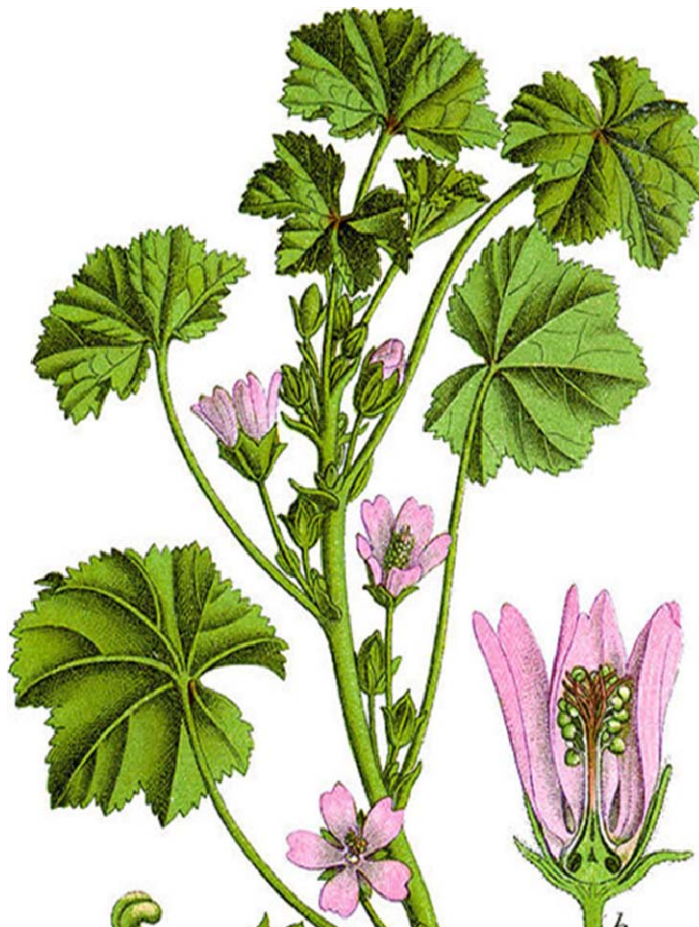
- A. Petiolate
- B. Whorled
- C. Sessile
- D. Alternate
- E. Opposite

**15. Blade venation is...**

- A. Palmate
- B. Pinnate
- C. Dichotomous
- D. Parallel
- E. Opposite

**16. The leaf is...**

- A. Petiolate
- B. Pedicellate
- C. Sessile
- D. Palmate
- E. Pinnate



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**17. What lies at the very tip of a root?**

- A. root hairs
- B. the region of maturation
- C. the root cap
- D. the region of cell division
- E. the root apical meristem

**18. What specifically prevents water from entering the root vasculature via the apoplastic pathway?**

- A. epidermis.
- B. pericycle.
- C. cortex.
- D. phloem.
- E. endodermis.

**19. In traversing the root to the central xylem vessels, the last living tissue that water passes through before entering the xylem is (assuming the most direct route) the**

- A. pericycle.
- B. endodermis.
- C. cortex.
- D. phloem.
- E. epidermis.

**20. In addition to anchoring a plant, roots usually function directly in which of the following processes?**

- A. photosynthesis
- B. production of new leaves
- C. production of bud scales
- D. absorption of inorganic nutrients in solution
- E. all of these answers are correct.

**21. Arborescent monocots are plants that grow tree-like and form support tissue...**

- A. via a vascular cambium.
- B. via a eustele
- C. via a pseudobulb
- D. via a cork cambium
- E. without the aid of a vascular cambium

**22. Banana trees are able to grow so tall on account of**

- a. woody stems
- b. stiff, overlapping and sheathing leaf bases
- c. a secondary-thickening meristem that develops after the woody stem elongates

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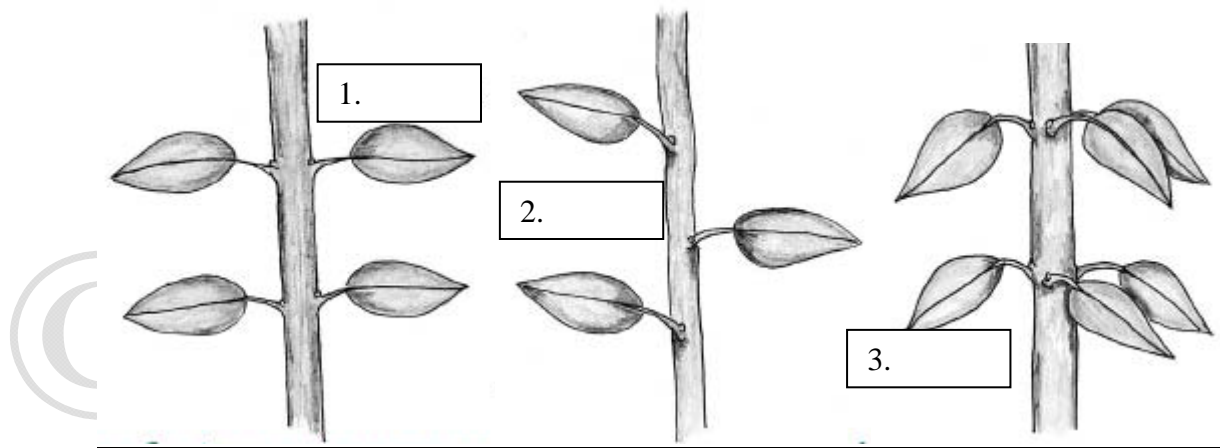
**23. Some monocots are able to become arborescent with an above-ground stem that is “woody” in texture. Characteristics of such plants include**

- a. the lack of a vascular cambium producing regular concentric growth rings or wood.
- b. a “woody”, fibrous trunk with many scattered vascular bundles as seen in cross-section.
- c. a vascular cambium with regular concentric growth rings or wood.
- d. all of the above.
- e. both “a” and “b”

**24. Many arborescent monocots are characterized by the action of at least a primary thickening meristem.**

- a. true
- b. false

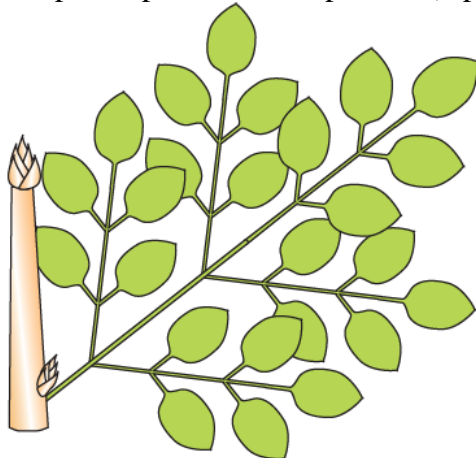
**25. Which is the correct order of leaf arrangement (phyllotaxy) adjectives, from left (1) to right (3)?**



- A. alternate, opposite, whorled.
- B. opposite, whorled, alternate.
- C. alternate, whorled, opposite.
- D. opposite, alternate, whorled.
- E. neither of the above.

**26. Which best describes the leaf or leaves below?**

- a. simple
- b. pinnate
- c. 2-pinnate (bipinnate)
- d. 3-pinnate (tripinnate)
- e. palmate



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**27. Which of the following “trees” has a pseudostem?**

- A. Oak
- B. Pine
- C. Coconut
- D. Pony-tail-palm
- E. Banana

**28. About what percentage of a terrestrial carnivore’s yearly caloric intake directly or indirectly ultimately comes from plants?**

- A. 0%
- B. 25%
- C. 50%
- D. 75%
- E. 100%

**29. Guam is in which ocean?**

- A. Atlantic
- B. Caribbean
- C. Pacific
- D. Indian
- E. Arctic

**30. The story of solving the mystery of Guam Dementia or Lytico-Bodig is an example of where...**

- A. ...a Pre-medicine program in Biology that is devoid of plant science courses is useful for solving problems in human health.
- B. ...the modern pharmaceutical industry and the drugs they produce can solve problems in human health.
- C. ...an understanding of plant science is useful for solving problems in human health.
- D. ...the National Institutes of Health could have benefitted from a little knowledge of the botany, ecology, and ethnobotany of Guam.
- E. Both C and D.

**31. Paired appendages associated with or near a petiole where the petiole attaches to a stem are**

- A. bundle scars.
- B. primordia.
- C. stipules.
- D. cuticles.
- E. leaf scars.

**32. An organelle that has its own DNA and whose main function is the storage of starch is called a(n)**

- A. Plastid
- B. Amyloplast
- C. Chloroplast
- D. Elaioplast
- E. Chromoplast

**33. Photosynthesis in the leaf takes place primarily in the ...**

- A. mesophyll parenchyma
- B. phloem
- C. xylem

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D. bundle fibers

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**34. Sugars produced by leaves must make their way to the \_\_\_\_\_ before being transported to the roots where they are needed.**

- A. mesophyll
- B. phloem
- C. xylem
- D. bundle fibers
- E. epidermis

**35. The most conspicuous and abundant organelle easily visible at the light microscope level in cells of the palisade mesophyll would be**

- A. vacuoles.
- B. nucleoli.
- C. mitochondria.
- D. chloroplasts.
- E. ribosomes.

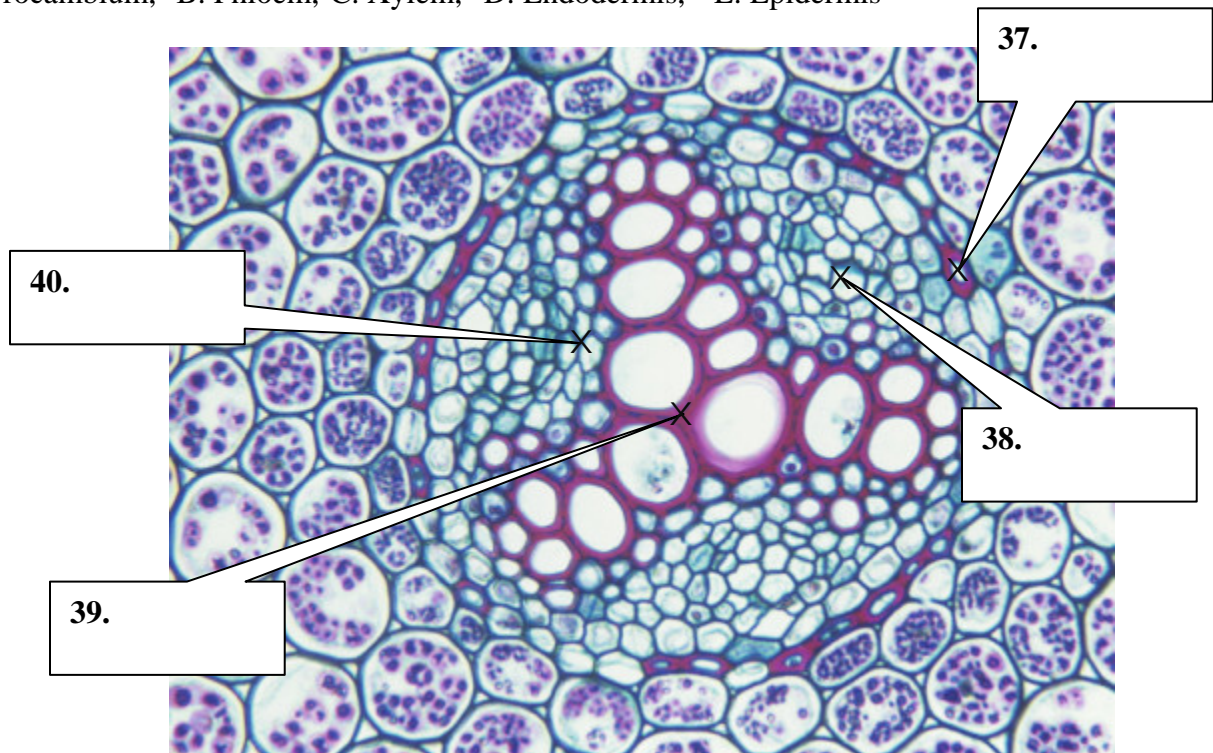
**36. Stomata are part of this tissue.**

- A. spongy mesophyll
- B. palisade mesophyll
- C. vascular bundles
- D. epidermis
- E. phloem parenchyma

**Questions 37-40, label the following figure with this set of possible terms:**

**Use the "x" as a guide to where the pointer is pointing precisely. Use each term only once if at all.**

A. Procambium, B. Phloem, C. Xylem, D. Endodermis, E. Epidermis



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**41. The wood below is from a....**

- A. monocot
- B. conifer
- C. gymnosperm
- D. dicot angiosperm
- E. moss



**42. The picture above shows cells oriented for transport in...**

- A. the radial system only
- B. the axial system only
- C. both the radial and axial system.

**43. The larger-diameter cells in the picture above in #41 are called**

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A. Sieve tube elements B. Tracheids C. Fibers D. Parenchyma cells E. Vessel elements

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**44. A tuber is primarily what (by volume)?**

- A. root
- B. stem
- C. leaf or leaves
- D. None of the above.

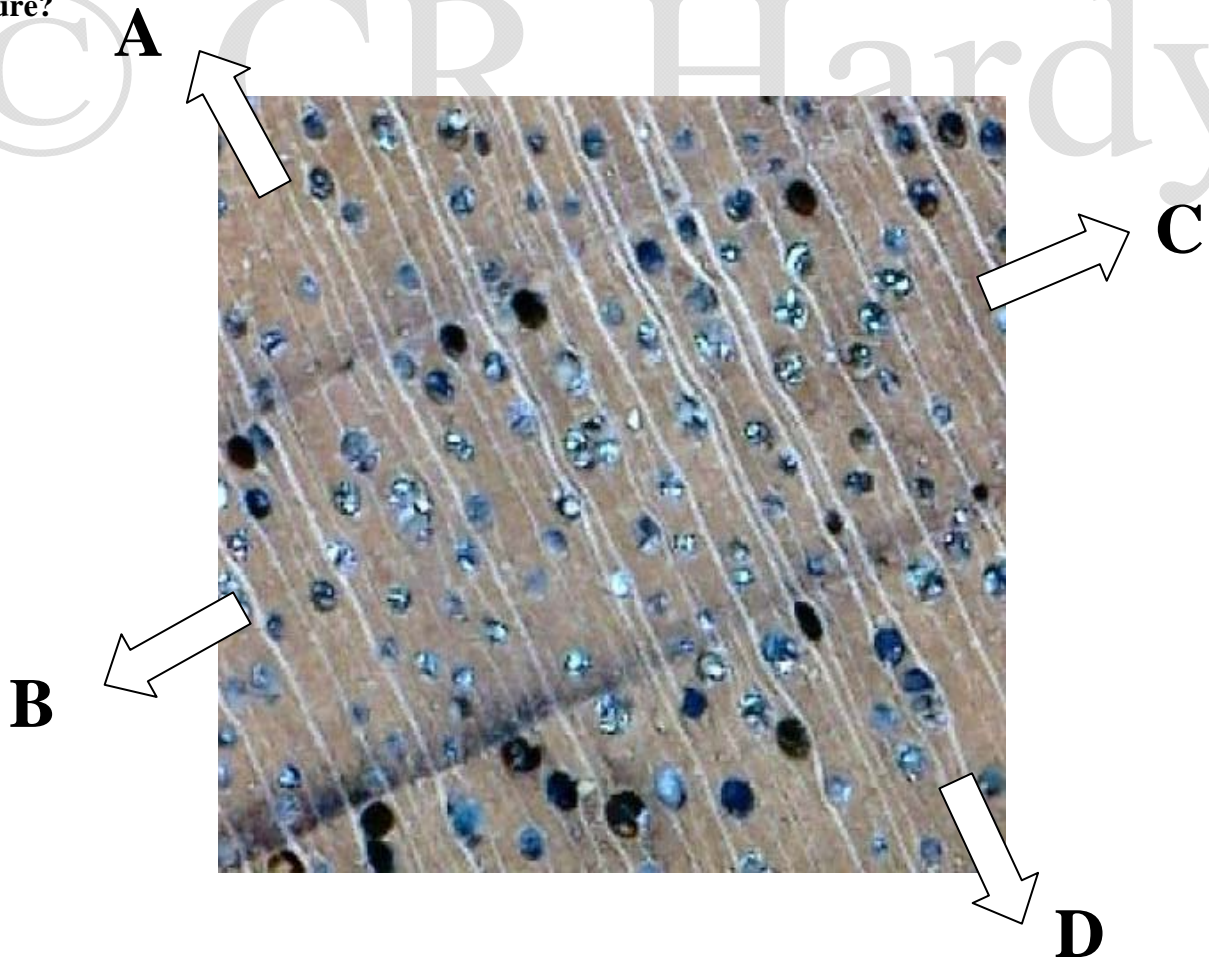
**45. A bulb is primarily what (by volume)?**

- A. root
- B. stem
- C. leaf or leaves
- D. None of the above.

**46. A horizontal, spreading underground stem is called a what?**

- A. stolon
- B. Tuber
- C. Tuberous root
- D. Cladophyll
- E. Rhizome

**47. Which lettered arrow represents the most direct route to the outside of the stem cut in this picture?**



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**48. How many full or partial years of secondary xylem are clearly discernible above in #47?**

- A. zero
- B. one
- C. two
- D. three
- E. four

**49. How many full or partial years of secondary phloem are clearly discernible above in #47?**

- A. zero
- B. one
- C. two
- D. three
- E. four

**50. How are cycads and palms similar?**

- A. Many members of both groups have naked seeds borne in strobili, and pinnate leaves in basal or more typically terminal rosettes on unbranched or rarely branched stems.
- B. Many members of both groups have seeds borne in fruits, and pinnate leaves in basal or more typically terminal rosettes on unbranched or rarely branched stems.
- C. Many members of both groups have pinnate leaves in basal or more typically terminal rosettes on unbranched or rarely branched stems.
- D. Many members of both groups have palmate leaves in basal or more typically terminal rosettes on unbranched or rarely branched stems.
- E. Many members of both groups have visibly simple leaves in basal or more typically terminal rosettes on unbranched or rarely branched stems, and cones.