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NOTE: SOME THINGS ON THIS SAMPLE EXAM MAY NOT BE RELEVANT TO THE CURRENT SEMESTER BECAUSE IT MAY NOT HAVE BEEN TAUGHT.

Bio 221 – Concepts of Botany  
Dr. Hardy  
Exam 3 (Spring 2013)

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

Instructions:

-PLEASE DO NOT TURN THIS PAGE OVER UNTIL PROF. HARDY HAS INSTRUCTED YOU TO DO SO.

-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.

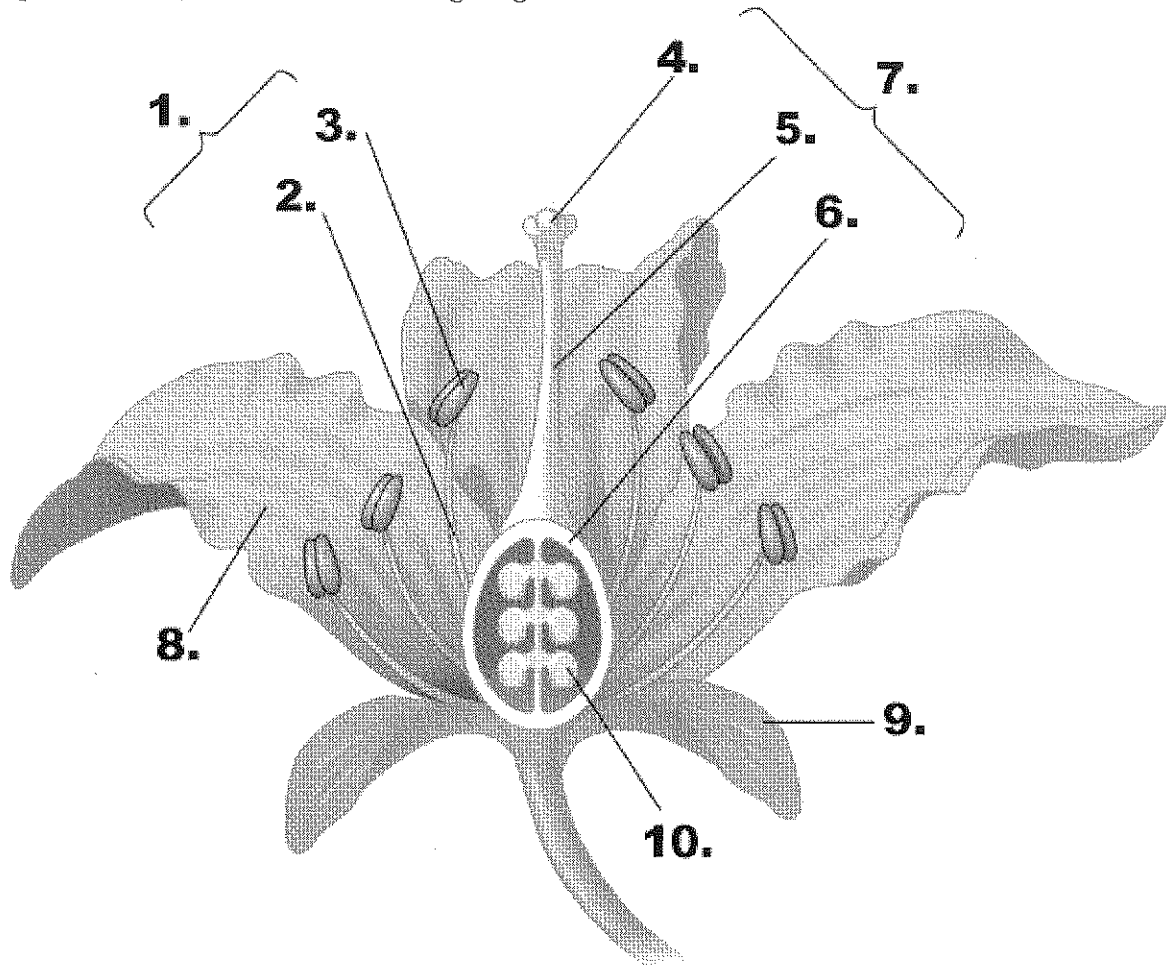
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Questions 1-7, refer to the following diagram



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1. Number "10" in the diagram above corresponds to a(n)...

- a. pistil
- b. carpel
- c. stigma
- d. style
- e. ovule

2. Number "1" in the diagram above corresponds to a(n)...

- a. anther
- b. filament
- c. stamen
- d. pistil
- e. petal

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**3. Number "4" in the diagram above corresponds to a(n)...**

- a. pistil
- b. carpel
- c. stigma
- d. style
- e. ovule

**4. Which of the numbers in the above diagram corresponds to a microsporophyll?**

- a. number 1
- b. number 7
- c. number 8
- d. number 9
- e. number 10

**5. Which of the numbers in the above diagram corresponds to a megasporophyll?**

- a. number 1
- b. number 7
- c. number 8
- d. number 9
- e. number 10

**6. Which of the numbers in the above diagram points closest to a megagametophyte?**

- a. number 1
- b. number 7
- c. number 8
- d. number 9
- e. number 10

**7. Which of the numbers in the above diagram points to where pollen is made?**

- a. number 8
- b. number 2
- c. number 3
- d. number 4
- e. number 10

**8. The two largest groups of angiosperms are the...**

- a. Monocots and Cycads
- b. Cycads and Conifers
- c. Ginkgos and Conifers
- d. Eudicots and Conifers
- e. Eudicots and Monocots

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**9. The two largest groups of gymnosperms are the...**

- a. Monocots and Cycads
- b. Cycads and Conifers
- c. Ginkgos and Conifers
- d. Eudicots and Conifers
- e. Eudicots and Monocots

**10. From which group does rosin and turpentine come from?**

- a. Monocots
- b. Eudicots
- c. Ginkgos
- d. Cyads
- e. Conifers

**11. From which group do orchids and palms come from?**

- a. Conifers
- b. Eudicots
- c. Ginkgos
- d. Cyads
- e. Monocots

**12. Which group has the youngest fossil record?**

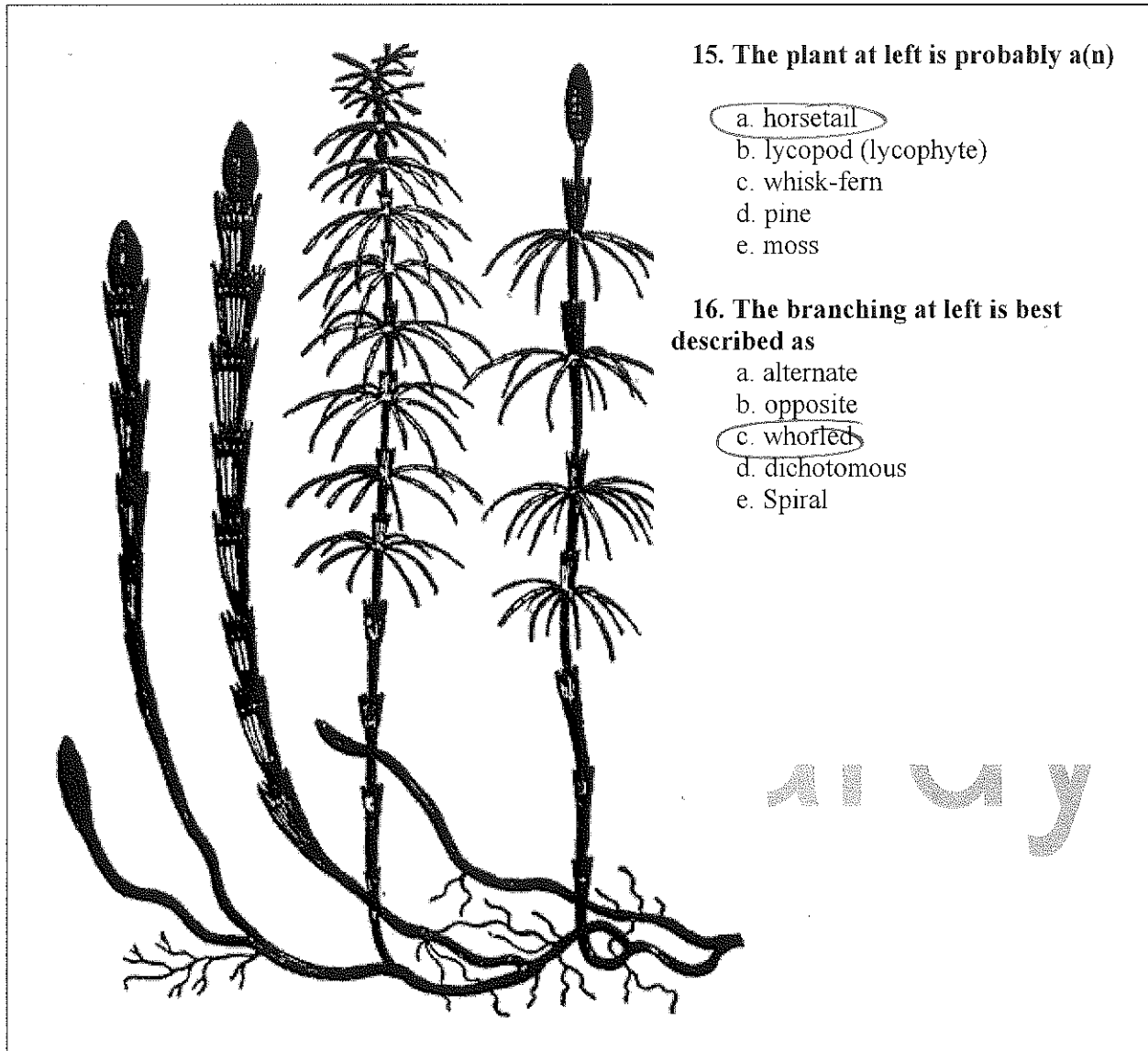
- a. Conifers
- b. Lycopods
- c. Ginkgos
- d. Cyads
- e. Monocots

**13. Which group should have the oldest fossil record?**

- a. Monocots
- b. Lycopods
- c. Ginkgos
- d. Cyads
- e. Liverworts

**14. Which of the following groups does not have some species with a strobilus?**

- a. Monocots
- b. Lycopods
- c. Ginkgos
- d. Cyads
- e. Liverworts



15. The plant at left is probably a(n)

- a. horsetail
- b. lycopod (lycophyte)
- c. whisk-fern
- d. pine
- e. moss

16. The branching at left is best described as

- a. alternate
- b. opposite
- c. whorled
- d. dichotomous
- e. Spiral

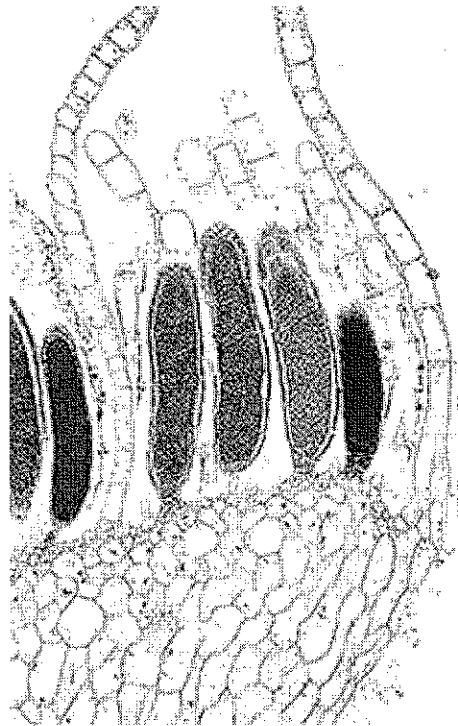
17. Double fertilization is:

- a. Found in Gymnosperms, where one sperm fertilizes one egg, and another sperm fertilizes a second.
- b. Found in Angiosperms, where one sperm fertilizes one egg, and another sperm fertilizes a second.
- c. Found in Gymnosperms, where one sperm fertilizes one egg, and another sperm fuses with the two polar nuclei of the central cell.
- d. Found in Angiosperms, where one sperm fertilizes one egg, and another sperm fuses with the two polar nuclei of the central cell.

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18. Which is the common name for *Coffea arabica*?

- a. coffee
- b. peyote
- c. cocaine
- d. tobacco
- e. caffeine



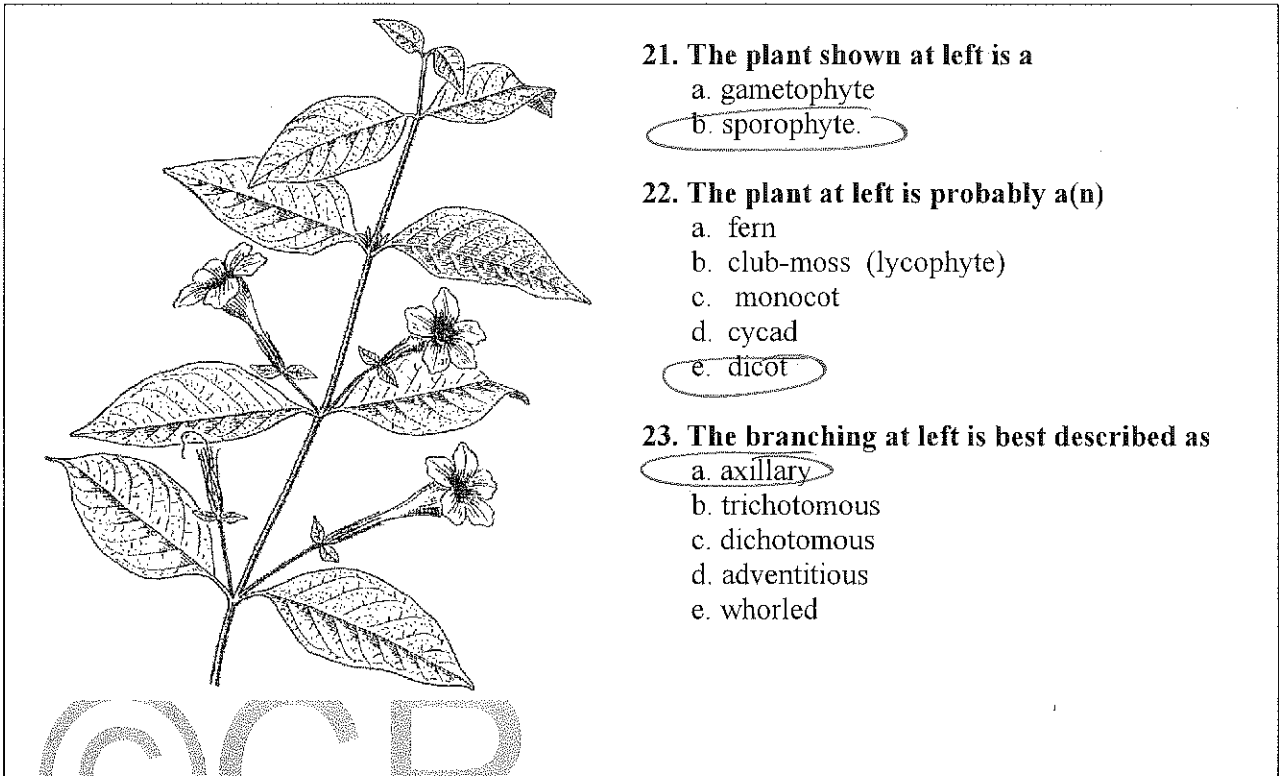
19. The picture at left is most likely of:

- a. a thallose liverwort (*Marchantia*) with archegonia.
- b. a moss with archegonia.
- c. An anther with pollen production underway.
- d. a moss with antheridia
- e. Ovules and an ovary.

20. The tissue pictured at left is mostly likely

- a. haploid
- b. diploid
- c. triploid
- d. tetraploid
- e. pentaploid

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21. The plant shown at left is a

- a. gametophyte
- b. sporophyte.

22. The plant at left is probably a(n)

- a. fern
- b. club-moss (lycophyte)
- c. monocot
- d. cycad
- e. dicot

23. The branching at left is best described as

- a. axillary
- b. trichotomous
- c. dichotomous
- d. adventitious
- e. whorled

24. Stomata are the \_\_\_\_\_ between \_\_\_\_\_.

- A) cells; subsidiary cells
- B) cells; guard cells
- C) pores; guard cells
- D) pores; subsidiary cells
- E) pores; trichomes

25. Roots employ amyloplasts to help sense gravity.

- a. True
- b. False

26. The primary food-conducting cells are

- A) sieve cells or sieve-tube members.
- B) tracheids and vessel elements.
- C) parenchyma cells.
- D) sclereids.
- E) phloem fibers.

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**27. Lenticels function primarily in:**

- A) water transport.
- B) gas exchange.
- C) mineral uptake.
- D) protection.
- E) hormone production.

**28. The O<sub>2</sub> evolved (given off) in photosynthesis comes from:**

- a. CO<sub>2</sub>.
- b. water
- c. glucose.
- d. (CH<sub>2</sub>O).
- e. (C<sub>3</sub>H<sub>3</sub>O<sub>3</sub>).

**29. In apical dominance, the shoot apical meristem:**

- a. inhibits the growth of lateral buds.
- b. stimulates the growth of lateral buds.
- c. stimulates the upward growth of the stem.
- d. stimulates the growth of leaves.
- e. inhibits the downward growth of the root.

**30. Which organelle in plant cells is thought to have arisen through endosymbiosis of a prokaryote symbiont?**

- a. the golgi-apparatus
- b. lysosomes.
- c. vacuoles.
- d. the mitochondrion.

**31. A young seedling is able to stand straight-up due to**

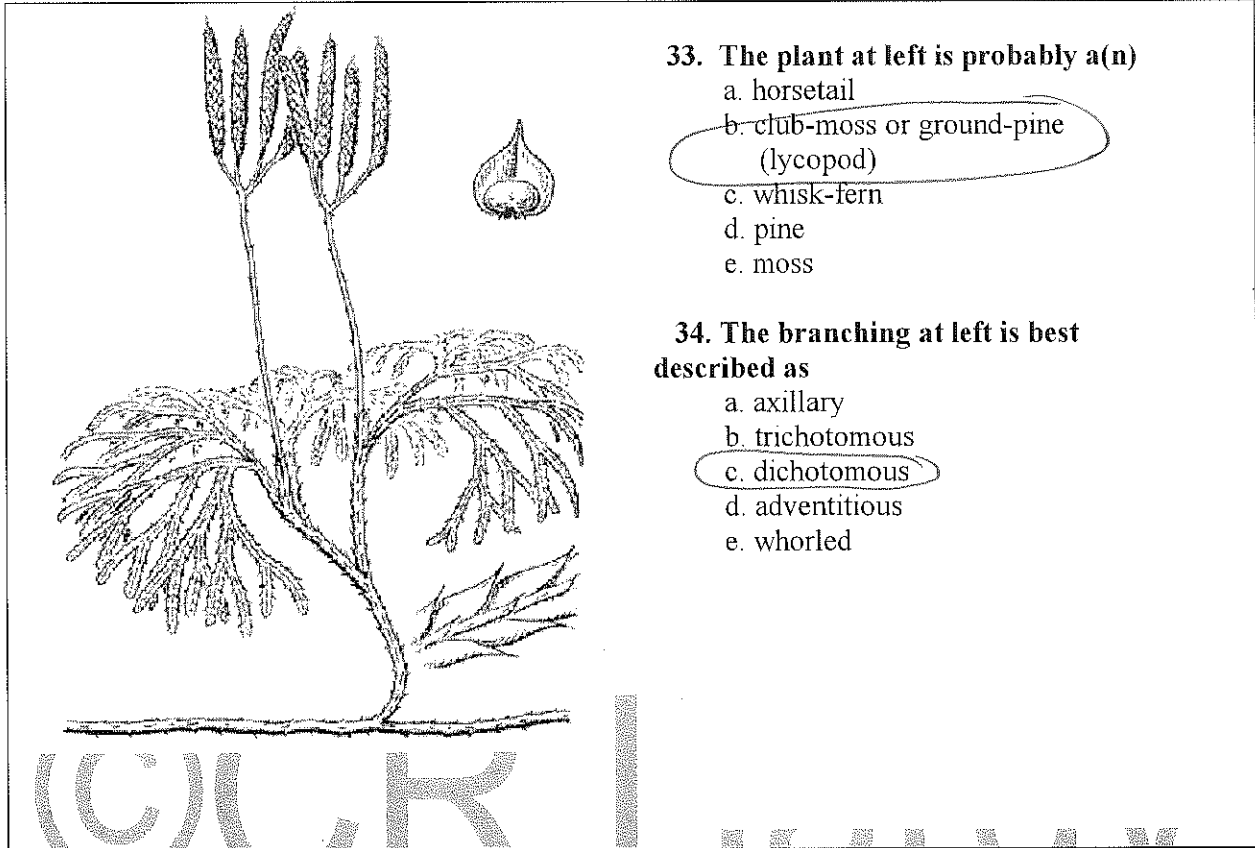
- a. a solid core of secondary xylem.
- b. a solid core of fibers in the center of the stem.
- c. turgor.
- d. both A and C.
- e. none of the above.

**32. Which of the following statements is NOT consistent with the cohesion-tension theory?**

- a. A gradient in water potential exists between the stem and the root.
- b. Root pressure is essential to the pushing of water from roots to leaves.
- c. Water in the xylem is under tension.
- d. A gradient of water potential provides the driving force for the movement of water from the leaves, plant, and soil.
- e. Transpiration brings about a lowered water potential in the leaves.



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33. The plant at left is probably a(n)

- a. horsetail
- b. club-moss or ground-pine (lycopod)
- c. whisk-fern
- d. pine
- e. moss

34. The branching at left is best described as

- a. axillary
- b. trichotomous
- c. dichotomous
- d. adventitious
- e. whorled

35. Many secondary plant compounds are thought to protect plants from herbivores and insects. An important group of such compounds are the

- a. starches.
- b. complex sugars.
- c. phospholipids.
- d. alkaloids.
- e. proteins.

36. Light Reactions ...

- a. Make NADPH
- b. Fix carbon
- c. Make ATP
- d. Both A and B
- e. Both A and C

37. What pigment makes photosynthesis possible?

- a. Eumelanin
- b. Pheomelanin

c. Chlorophyll

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c. chlorophyll

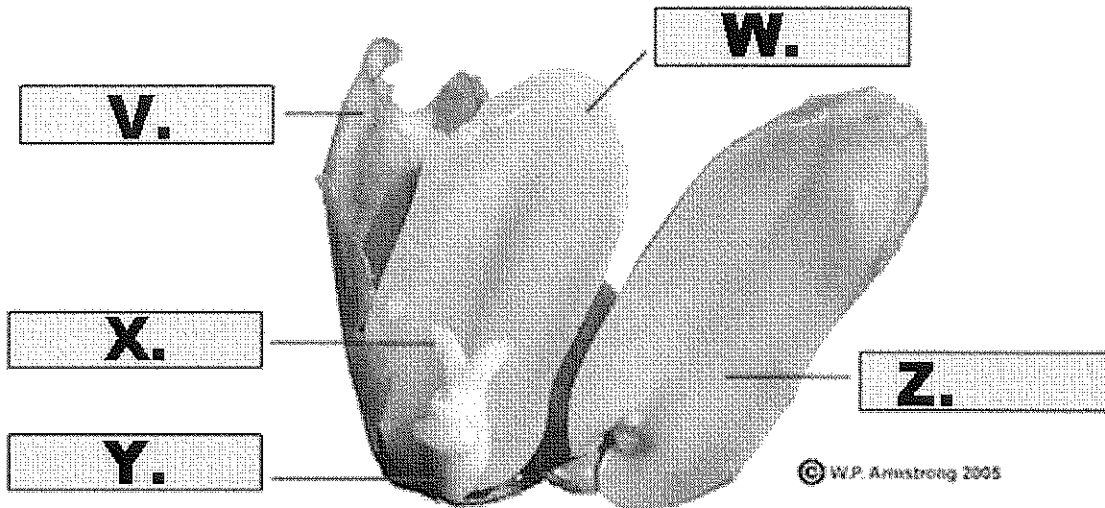
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Questions 38-41, answer what the letters in the figure correspond. Use the following options.

- A. Archegonium    B. Seed coat    C. Cotyledon    D. Radicle    E. Plumule



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38. "V" is the....

B

39. "W" is a ....

C

40. "X" is the ...

E

41. "Z" is a....

C

42. The three basic types of vegetative organs in plants are

- a. Internodes, nodes, leaves
- b. leaves, stems, roots
- c. roots, root hairs, and chloroplasts
- d. dermal tissue, vascular tissue, and ground tissue

43. Plants (Kingdom Plantae) include which of the following?

- a. Cyanobacteria, green algae, red algae, brown algae, angiosperms, gymnosperms, ferns and fern allies, bryophytes.
- b. green algae, red algae, brown algae, angiosperms, gymnosperms, ferns and fern allies, bryophytes
- c. angiosperms, gymnosperms, ferns and fern allies, bryophytes, algae
- d. angiosperms, gymnosperms, ferns and fern allies, mosses, liverworts, hornworts, cyanobacteria
- e. angiosperms, gymnosperms, ferns and fern allies, mosses, liverworts, hornworts

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**44. The vascular plants originated (evolved) directly from**

- a. some red algal lineage.
- b. some cyanobacterial lineage.
- c. some green algal lineage.
- d. some gymnosperm lineage.
- e. some bryophyte-like lineage.

**45. The Kingdom Plantae originated (evolved) directly from**

- a. some red algal lineage.
- b. some cyanobacterial lineage.
- c. some green algal lineage.
- d. some gymnosperm lineage.
- e. some bryophyte lineage.

**46. The Angiosperms originated (evolved) directly from**

- a. some red algal lineage.
- b. some cyanobacterial lineage.
- c. some green algal lineage.
- d. some gymnosperm lineage.
- e. some bryophyte lineage.

**47. Seed Plants include which of the following lineages?**

- a. Ferns, angiosperms, gymnosperms, horsetails
- b. Ferns, angiosperms, gymnosperms, horsetails, lycophytes (e.g., Lycopodium)
- c. Ferns, angiosperms, gymnosperms, horsetails, lycophytes (e.g., Lycopodium)
- d. Angiosperms, gymnosperms
- e. Ferns, angiosperms, gymnosperms

**48. Gemmae of some liverworts are multicellular structures involved in:**

- a. protecting the young embryo.
- b. anchoring the plant to the soil.
- c. water and nutrient conduction.
- d. sexual reproduction.
- e. asexual reproduction.

**49. Large kelp bodies are generally differentiated into three regions:**

- a. filament, gametangia, and sporangia.
- b. blade, holdfast, and stipe.
- c. gametophyte, sporophyte, and gametes.
- d. blade, holdfast, and meristem.

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50. The ovary of the flower matures into a(an)

- a. carpel.
- b. inferior ovary.
- c. pollen sac.
- d. fruit.
- e. seed.

51. A single carpel that matures into a dry structure that dehisces along two sutures is a ....

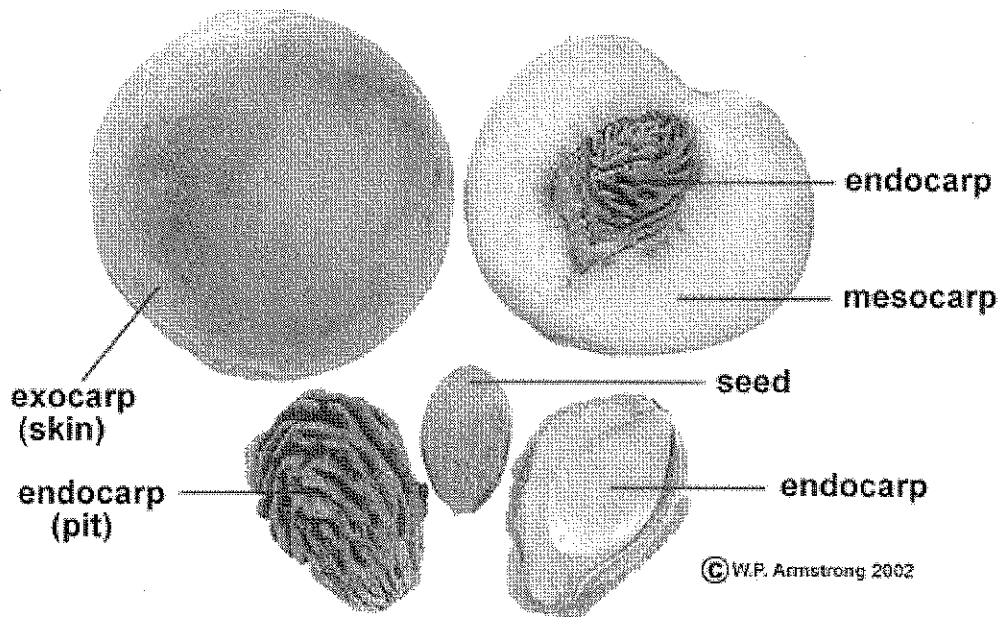
- a. Capsule
- b. Berry
- c. Follicle
- d. Legume
- e. Drupe

52. A single carpel that matures into a dry structure that dehisces along one suture is a ....

- a. Capsule
- b. Berry
- c. Follicle
- d. Legume
- e. Drupe

53. The structure diagrammed below is mostly fleshy but has a sclerified endocarp. What is it?

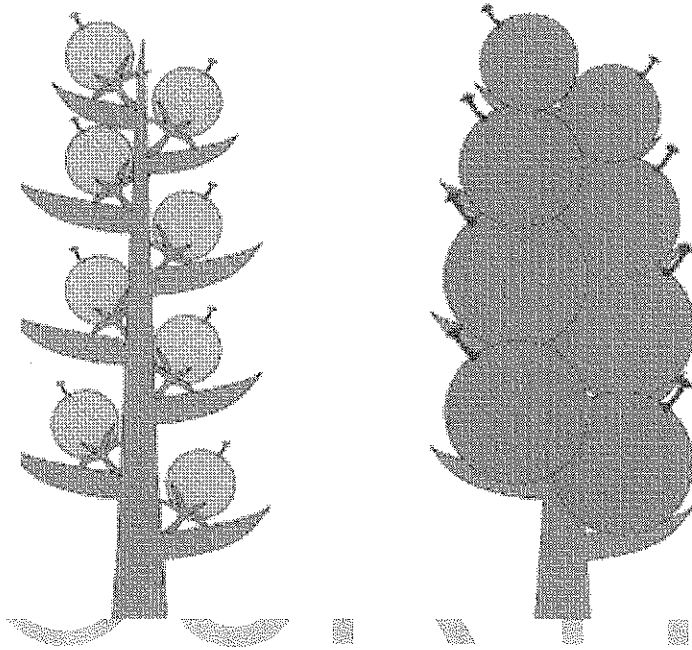
- a. Capsule
- b. Berry
- c. Follicle
- d. Legume
- e. Drupe



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**54. The pair of diagrams below shows...**

- a. the development of a single simple fruit
- b. the development of a multiple fruit
- c. the development of a compound fruit
- d. the development of an aggregate fruit
- e. the development of a complex fruit



**55. Why are flagellate sperm not generally necessary in seed plants?**

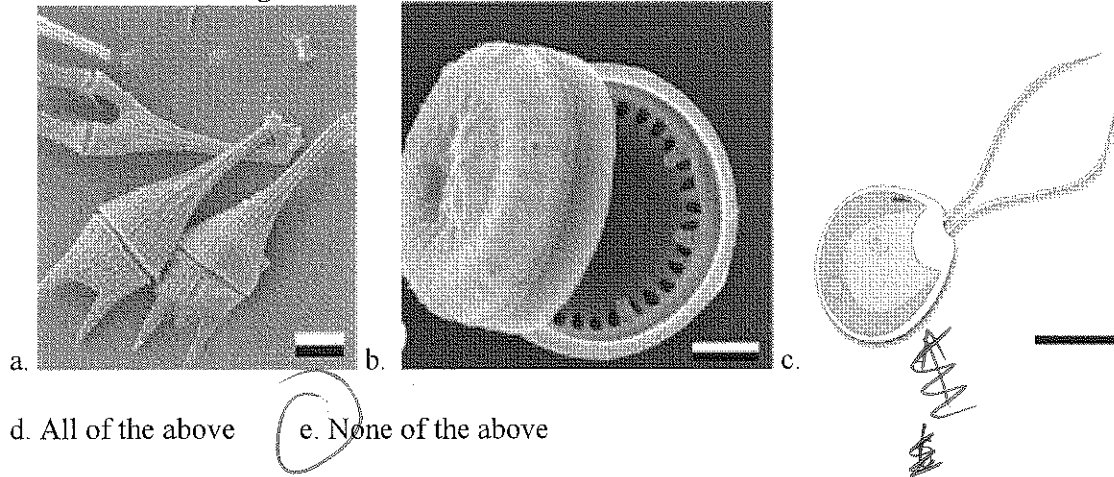
- A. The question is not relevant, since all seed plants have flagellate sperm.
- B. Because sperm do not have to swim through water to reach the egg of the female gametophyte, rather they are delivered there directly via the pollen.
- C. Because sperm must swim to the egg of the female gametophyte.

**56. Which of the following group of plants does not have flagellate sperm?**

- A. Bryophytes
- B. Ferns
- C. Lycopods
- D. Cycads
- E. Angiosperms

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57. Which of the organisms below is multicellular?



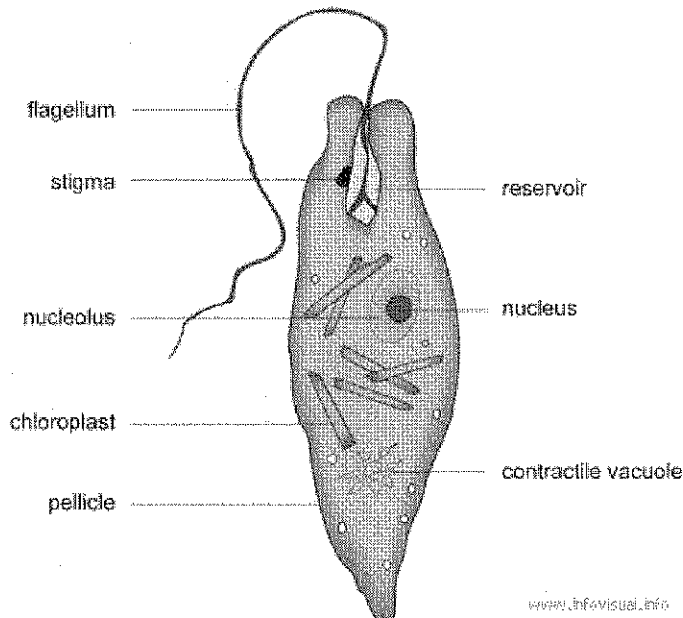
58. Which of the organisms in 57 above sometimes causes or is closely related to those that can cause paralytic shellfish poisoning?

A, B, or C?

59. Which of the organisms in 57 above has the same chloroplast pigment profile as plants?  
A, B, or C?

60. The organism below is a ....

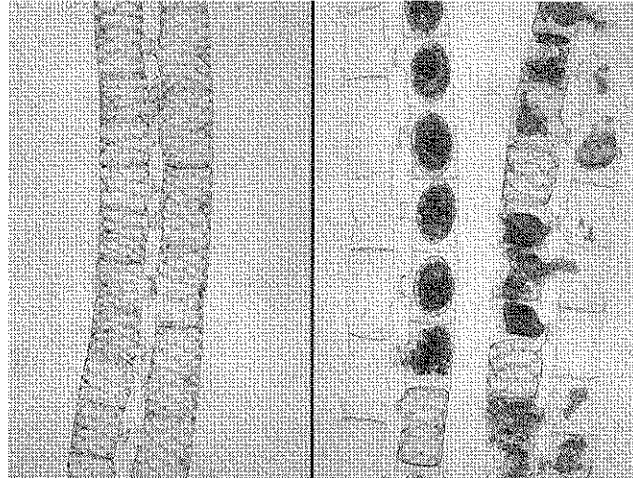
- a. *Chlamydomonas*    b. *Chlorella*    c. diatom    d. dinoflagellate    e. euglenoid



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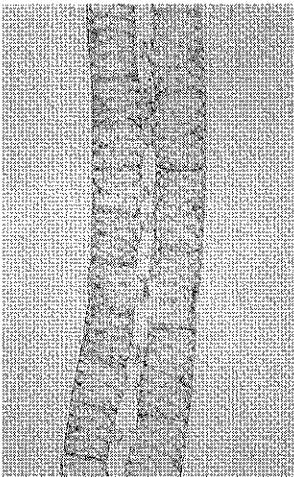
61. What is shown below?

- A. Oogamous sexual reproduction
- B. Asexual reproduction
- C. Isogamous sexual reproduction
- D. Conjugation
- E. Endosymbiosis



62. The ploidy of the filaments pictured below is...

- A. tetraploid
- B. pentaploid
- C. haploid
- D. Diploid
- E. triploid





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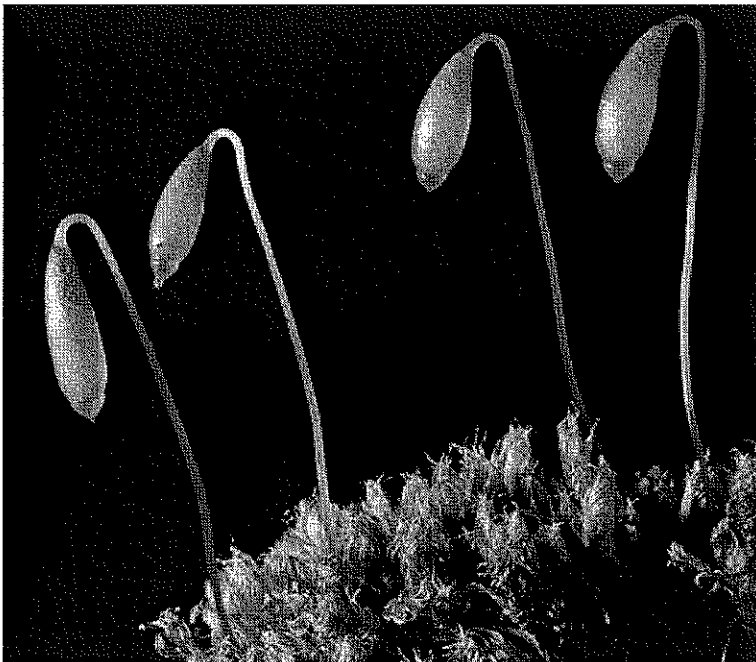
63. In the picture below, some of the cells are already \_\_\_\_\_, and others are becoming \_\_\_\_\_.

- A. tetraploid
- B. pentaploid
- C. haploid
- D. Diploid
- E. triploid



64. How many strobili are pictured below?

- a. four
- b. three
- c. two
- d. one
- e. zero

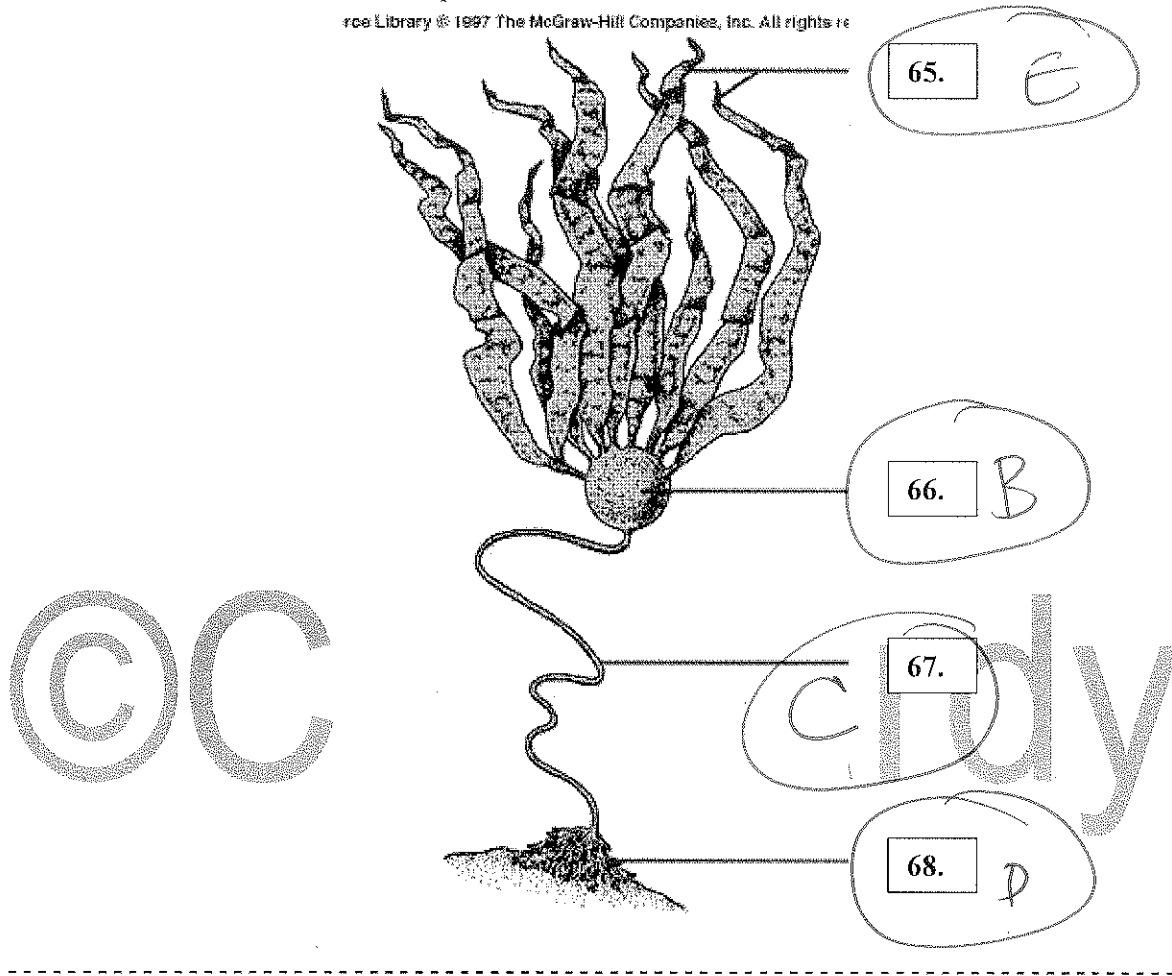


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Questions 65-68, identify the part pointed to by each question, using the following possible answers:

- A. Leaf    B. Bladder    C. Stipe    D. Holdfast    E. Blade .

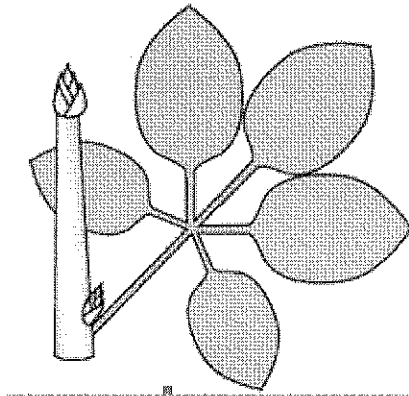
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69. Which best describes the leaf or leaves below?

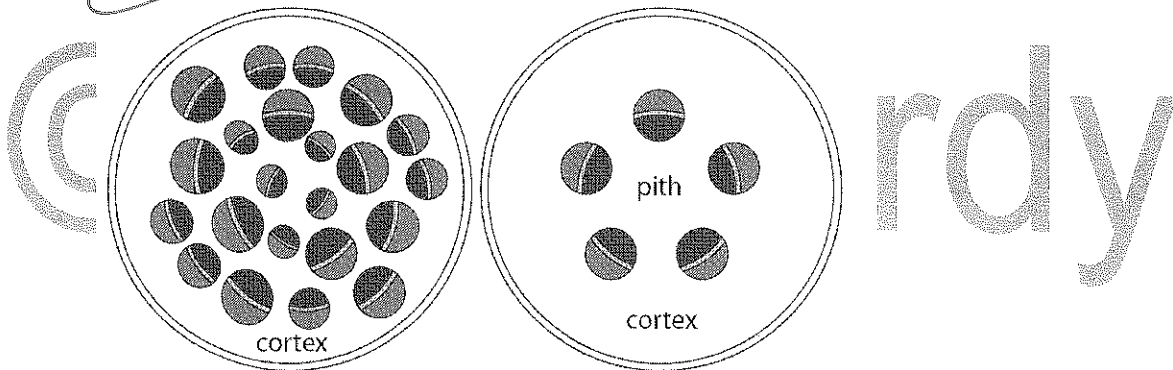
- a. simple    b. pinnate    c. 2-pinnate (bipinnate)    d. 3-pinnate (tripinnate)    e. palmate

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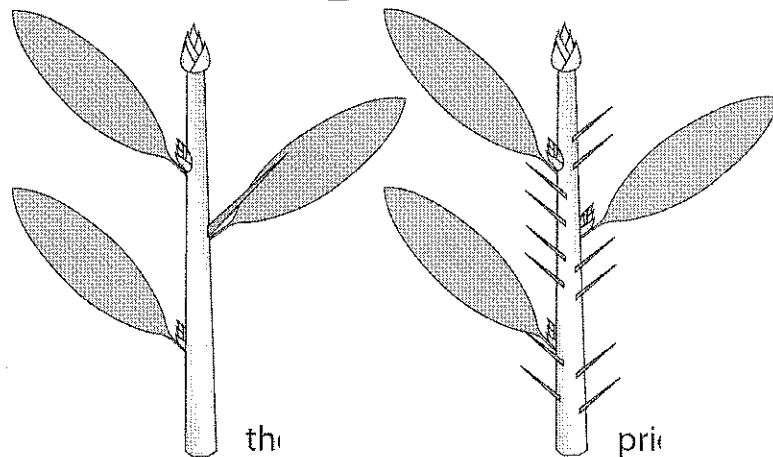
70. The pictures below depict....

- 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 leaf cross-section from a monocot (left) and a dicot (right).
- E. a stem cross-section from a monocot (left) and dicot (right).



71. Which of the following is not represented below?

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



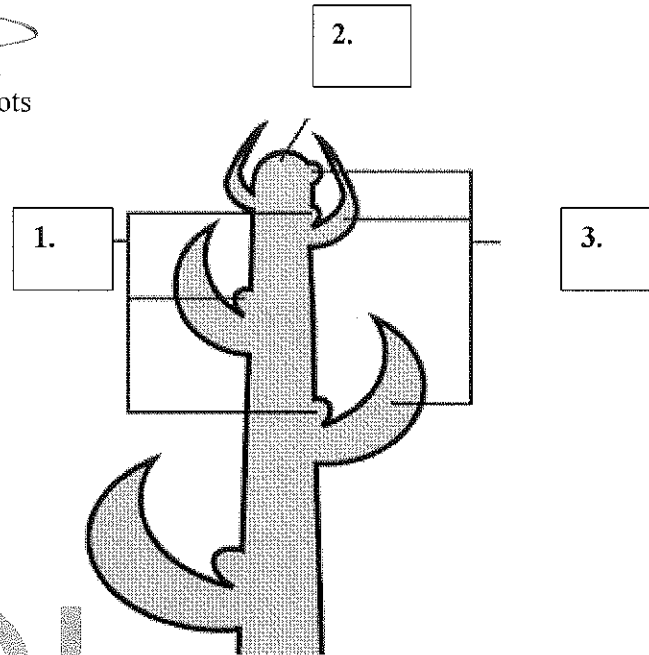
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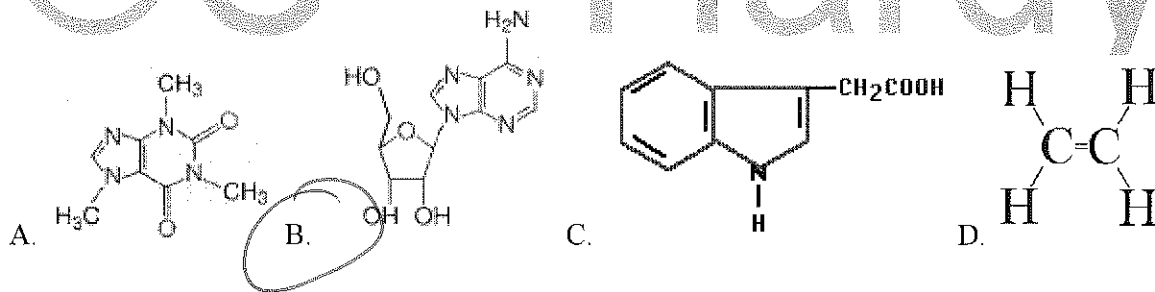
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72. What is(are) the structure(s) labeled by "3" below?

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



73. Which of the following chemicals is adenosine?



74. Which has more caffeine?

- A. a 1 oz cup of drip coffee.
- B. a 1 oz cup of espresso.
- C. a 1 oz cup of Coca-cola.

75. *Coffea arabica* is native to where?

- A. Australia
- B. Africa
- C. Arabia
- D. Asia
- E. South America

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