

BOT 125 - Plant Morphology

Winter 2002, Final

1. Read these directions before you begin.
2. Write your name on your Scantron sheet and make sure it is on the 8½×11 exam guide (tests without names will not be graded).
3. Write the number of your lab section on the Scantron sheet in the box marked Hour (sect. 1 = MW 12-3 [Katie], sect. 2 = MW 3-6 [Sean]). Scantrons without lab sections will have one point deducted from the total.
4. Check this test to make sure it has all pages, 1-3.
5. Mark all answers on the Scantron sheet. There is only one correct answer to each question.
6. When you are finished, turn in both the Scantron and the 8½×11 exam guide on the front table. Please keep this sheet.

For each of the next ten questions, tell whether the cell, structure, or organism is:

- a. Haploid
- b. Diploid
- c. Triploid
- d. Dikaryotic
- e. The ploidy level cannot be determined from the information given

1. Antheridiophore **a**
2. Endosperm **c**
3. Endotesta **b**
4. Female gametophyte **a**
5. Megaspore **a**
6. Nucellus **b**
7. Pollen grain **a**
8. Rhizoid **e**
9. Sporangiophore **b**
10. Sporophyll **b**

For each of the next ten questions, tell which phylum the cell or structure is associated with:

- a. Anthophyta
- b. Bryophyta
- c. Coniferophyta
- d. Hepatophyta
- e. Pterophyta

11. Archegoniophore **d**
12. Cone scale **c**
13. Endosperm **a**
14. Leptosporangium **e**
15. Ovary **a**
16. Peristome **b**
17. Petal **a**
18. Sclerotesta **c**
19. Siphonostele **e**
20. Sorus **e**

21. _____ are never flagellated.
 - a. Anthophyta sperm cells
 - b. Bryophyta sperm cells
 - c. Cycadophyta sperm cells
 - d. Ginkgophyta sperm cells
 - e. Pterophyta sperm cells
22. A group of meiosporangia fused together, such as we find in the Psilotophyta and Anthophyta, is called a(n)
 - a. nucellus
 - b. ovary
 - c. sorus
 - d. sporophyll
 - e. synangium
23. A pollen grain is
 - a. a microspore
 - b. a sperm cell of a seed plant
 - c. an endosporic male gametophyte
 - d. an exosporic female gametophyte
 - e. an integumented microsporangium
24. A seed plant lives in the mountains, forms a tall tree, has needle leaves with resin ducts, is dioecious, and has ovules on cone scales. It must be a member of the division
 - a. Anthophyta
 - b. Coniferophyta
 - c. Cycadophyta
 - d. Gnetophyta
 - e. Pterophyta
25. An important feature of the vascular plants is free-living sporophytes. Why is this feature important?
 - a. It allows the sporophytes to become large enough to branch and produce more meiosporangia
 - b. It eliminates the need for gametophytes
 - c. It increases the number of archegonia per gamete
 - d. It prevents self-fertilization
 - e. It transports water

26. An integument turns into a(n) _____, an ovule turns into a(n) _____, and an ovary turns into a(n) _____.
- nucellus . . . sclerotesta . . . sarcotesta
 - nucellus . . . seed coat . . . seed
 - seed . . . seed coat . . . fruit
 - seed coat . . . egg . . . gametangium
 - seed coat . . . seed . . . fruit
27. Anthoceroophyta gametophytes most likely have mucilage-filled intercellular spaces
- because they are diploid
 - because they are primitive and not much different from algae
 - to allow free gas exchange in the gametophyte
 - to help the meiospores disperse
 - to provide a home for symbiotic cyanobacteria
28. *Chara* of the Charophyceae (Chlorophyta) is similar to the land plants because they both have
- gametangia with sterile jackets
 - alternation of generations
 - stomata
 - free-living sporophytes
 - stems made of large, multinucleate cells
29. Exosporic female gametophytes provide food to the developing embryonic sporophytes. Where do they get it?
- by ingesting bacteria and other small organisms
 - from photosynthesis or by parasitizing fungi
 - from the Restaurant at Kellogg Ranch
 - stored food from the large megaspore
 - they steal it from the embryonic sporophyte
30. Fully internal fertilization (sperm cells do not require environmental water) is a feature of all
- eukaryotes
 - green plants
 - land plants
 - seed plants
 - vascular plants
31. In most seed plants, pollen tubes begin their growth _____, but in Anthophyta, they begin their growth _____.
- in the egg cell in the sperm cell
 - in the micropyle in the anther
 - in the pollen chamber on the stigma
 - on the stigma in the pollen chamber
 - on the style in the nucellus
32. In addition to the large generative cell, most seed plant pollen grains contain several additional small cells called
- antipodal cells
 - microsporocytes
 - prothallial cells
 - protonema
 - tube nuclei
33. In *all* seed plants, the pollen tube
- absorbs nutrients for the developing sperm
 - carries the sperm cells to the egg
 - grows from the stigma down the style to the ovule
 - grows through the micropyle
 - is diploid
34. In Anthophyta, ovules are located inside the
- anther
 - archegonium
 - cone scale
 - megasporangium
 - ovary
35. In Bryophyta and Hepatophyta, parts of the archegonium form a thin sheet of cells called the *calyptra* that covers the developing sporophyte. The calyptra must be
- diploid
 - haploid
 - it has no ploidy level, since the archegonium is not made of cells
 - its ploidy level cannot be determined
 - triploid
36. In endospermous seeds, food is stored
- in the cotyledons
 - in the endosperm
 - in the female gametophyte
 - in the nucellus
 - in the style and stigma
37. Indusia
- always cover the ovules
 - are associated with sori
 - are associated with sporangiophores
 - are compound pollen cones
 - are found on the upper surface of leaves in the Psilotophyta
38. Most of the fungi that take part in the lichen symbiosis are members of the division _____, and most of the algae are in the division _____.
- Ascomycota . . . Chlorophyta
 - Ascomycota . . . Cyanobacteria
 - Basidiomycota . . . Chlorophyta
 - Basidiomycota . . . Cyanobacteria
 - Rhodophyta . . . Zygomycota

39. One of the ways to recognize paraphyletic groups such as the Magnoliopsida is that they have no features unique to them. The Liliopsida are monophyletic, though; what is one feature that is found in all Liliopsida and no other flowering plants?
- flower parts in 4 or 5
 - one cotyledon
 - roots
 - siphonostele
 - wood
40. Seed plants reproduce by seeds. Most other land plants reproduce primarily or exclusively by
- carpospores
 - clonal spores
 - meiospores
 - pollen grains
 - zoospores
41. Some members of the Cycadophyta are pollinated by insects, but the modern Phylum with the greatest number of insect-pollinated species is the
- Anthophyta
 - Coniferophyta
 - Ginkgophyta
 - Gnetophyta
 - Pterophyta
42. The cell walls of the Kingdom Plantae are mainly cellulose, but there is another important cell wall material found only in the vascular plants:
- chitin
 - laminarin
 - lignin
 - starch
 - tannin
43. The center of the stems of Sphenophyta is ordinarily filled with _____, its function is _____.
- air . . . gas exchange to the rhizomes and roots
 - parenchyma cells of the pith . . . food storage
 - phloem . . . water transport
 - water . . . support
 - xylem . . . food transport
44. The common food transport product of the Anthophyta is
- flavonoid
 - glycogen
 - lipid
 - mannitol
 - sucrose
45. The opening in the integument of an ovule through which the pollen passes is called the
- antipodal cell
 - megapyle
 - microphyll
 - micropyle
 - microspore
46. The single living species of the Ginkgophyta is
- Ginkgo antisiphiliticum*
 - Ginkgo biloba*
 - Ginkgo cerevisiae*
 - Ginkgo flavus*
 - Ginkgoxylon infestans*
47. The vascular cambium is responsible for forming
- pith
 - primary phloem
 - secondary xylem
 - the eustele
 - the integument
48. We know that the seed plants are a monophyletic group (they all descend from a common ancestor) because they all have
- endosporic gametophytes
 - flowers
 - non-motile sperm
 - seeds
 - xylem
49. You are sampling algae in a pond much like the Cal Poly duck pond (except that it has coots instead of ducks). The majority of the algae have β -carotene and store starch. They are members of the division
- Anthophyta
 - Anthocerophyta
 - Bryophyta
 - Chlorophyta
 - Ginkgophyta
50. You are taking a lab exam. The next station is a sectioned Ginkgo seed. The card says "What is the name of the haploid structure at the pin? But the pin is missing. What is the right answer?"
- embryo
 - endosperm
 - female gametophyte
 - nucellus
 - sarcotesta