

**BOT 125 - Plant Morphology**  
**Fall 1991**  
**Final Exam**

Name \_\_\_\_\_ Lab Section \_\_\_\_\_

Answer all questions on the Scantron sheet. There is only one correct answer to each question. Please turn in this sheet as well as the Scantron, and indicate your **lab** section on each.

1. Peptidoglycan cell walls are found in the
  - a. Acrasiomycota
  - b. Monera
  - c. Oomycota
  - d. Psilophyta
  - e. Pyrrhophyta
2. Chitin cell walls are found in the
  - a. Chlorophyta
  - b. Euglenophyta
  - c. Oomycota
  - d. Pterophyta
  - e. Zygomycota
3. Cellulose cell walls are found in the
  - a. Ascomycota
  - b. Cyanobacteria
  - c. Euglenophyta
  - d. Lycophyta
  - e. Myxomycota
4. Cell walls are absent in the
  - a. Basidiomycota
  - b. Chlorophyta
  - c. Euglenophyta
  - d. Pyrrhophyta
  - e. Sphenophyta
5. The Rhodophyta have
  - a.  $\beta$ -carotene
  - b. chlorophyll c
  - c. mannitol
  - d. no motile cells
  - e. xylem and phloem

6. Chlorophyll b is found in the
  - a. Ascomycota
  - b. cyanobacteria
  - c. Oomycota
  - d. Pterophyta
  - e. Pyrrhophyta
7. Ordinarily only a single flagellum is present in the motile cells of the
  - a. Euglenophyta
  - b. flowering plants
  - c. Phaeophyta
  - d. Pyrrhophyta
  - e. Rhodophyta
8. The common food storage product of the Psilophyta is
  - a. floridean starch
  - b. glycogen
  - c. mannitol
  - d. paramylon
  - e. starch
9. Phloem is found in the
  - a. Acrasiomycota and Basidiomycota
  - b. Chlorophyta and Bryophyta
  - c. Phaeophyta and Lycophyta
  - d. Psilophyta and cyanobacteria
  - e. Pyrrhophyta and Phaeophyta
10. Which one of these does not have brown plastids?
  - a. Bacillariophyceae
  - b. Oomycota
  - c. Phaeophyta
  - d. Pyrrhophyta
  - e. Xanthophyceae
11. The \_\_\_\_ characteristically have a filamentous sporophyte.
  - a. Ascomycota
  - b. cyanobacteria
  - c. Euglenophyta
  - d. Oomycota
  - e. Xanthophyceae
12. Parenchyma tissue can be found in the sporophytes of the
  - a. Phaeophyta
  - b. Pyrrhophyta
  - c. Myxomycota
  - d. Basidiomycota
  - e. Chrysophyta
13. Parenchyma tissue can be found in the gametophytes of the
  - a. Bryophyta
  - b. Chrysophyta
  - c. Myxomycota
  - d. Phaeophyta
  - e. Pyrrhophyta
14. Gametes are formed by mitosis in haploid gametangia in the
  - a. cyanobacteria

- b. Euglenophyta
  - c. multicellular animals
  - d. Oomycota
  - e. Pterophyta
15. \_\_\_\_\_ are always diploid.
- a. Gametes
  - b. Gametophytes
  - c. Microspores
  - d. Zoospores
  - e. Zygotes
16. \_\_\_\_\_ are always haploid.
- a. Gametangia
  - b. Gametophytes
  - c. Meiosporangia
  - d. Zoospores
  - e. Zygotes
17. \_\_\_\_\_ are always flagellated.
- a. Egg cells
  - b. Protista
  - c. Sperm cells
  - d. Zoospores
  - e. Zygotes
18. Endosporic gametophytes are found in some members of the
- a. Bryophyta
  - b. Euglenophyta
  - c. Psilophyta
  - d. Pterophyta
  - e. Sphenophyta
19. In cyanobacteria, nitrogen fixation usually (but not always) takes place in
- a. the gametophyte
  - b. the heterocysts
  - c. the leaves
  - d. the roots
  - e. the sporophyte
20. We can always recognize the evolutionary kinship between specific organisms by
- a. how advanced or primitive they are
  - b. the homologies they share
  - c. their cell wall materials
  - d. their position in the classification in the book
  - e. their similar fossils
21. The Chlorophyceae are most closely related to
- a. the Charophyceae and embryophytes
  - b. the Euglenophyta
  - c. the Oomycota
  - d. the Phaeophyta
  - e. the Xanthophyceae
22. The bryophyte group most closely related to the vascular plants is the
- a. Anthocerotopsida
  - b. Hepaticopsida
  - c. Muscopsida

- d. Psilopsida
  - e. Sphenopsida
23. We know that the seed plants are a monophyletic group (they all descend from a common ancestor) because they all have
- a. archegonia
  - b. endosporic gametophytes
  - c. non-motile sperm
  - d. seeds
  - e. xylem
24. The sporangia of the Sphenophyta are borne on
- a. cone scales
  - b. dichotomizing stems
  - c. megaphylls
  - d. microphylls
  - e. sporangiophores
25. The elaters of *Equisetum* spores
- a. are attached to the columella of the sporangium
  - b. are found in the gametophyte only
  - c. are homologous with the elaters of the Bryophyta
  - d. are made of diploid cells
  - e. expand when dry to improve wind dispersal

26. The center of an *Equisetum* stem is ordinarily
  - a. a strand of phloem
  - b. a strand of xylem
  - c. composed of parenchyma cells
  - d. filled with water
  - e. hollow
27. A leptosporangium
  - a. contains many hundreds of meiospores
  - b. forms from a single epidermal cell
  - c. is always found in a strobilus
  - d. is ancestral to the eusporangium
  - e. is found only in the Lycopphyta
28. The vascular tissue of ferns is characteristically
  - a. arranged in a eustele
  - b. arranged in a protostele
  - c. arranged in a siphonostele
  - d. composed of xylem only
  - e. found only in the fronds
29. Gametophytes of homosporous ferns
  - a. are endosporic
  - b. are free-living and photosynthetic
  - c. are unisexual
  - d. are saprophytic
  - e. have archegonia only
30. Sori
  - a. always have indusia
  - b. are homologous to meiosporangia
  - c. are located on the upper surfaces of the leaves
  - d. are only found in heterosporous ferns
  - e. contain meiosporangia
31. The Ophioglossales
  - a. are always aquatic
  - b. are heterosporous
  - c. are leptosporangiate
  - d. are probably more closely related to seed plants than to other ferns
  - e. never have secondary growth
32. The progymnosperms (the group of extinct plants that gave rise to the seed plants)
  - a. included tall trees
  - b. never had secondary growth
  - c. produced leptosporangia
  - d. were always heterosporous
  - e. were non-photosynthetic
33. An ovule can be characterized as
  - a. a cone scale with a megaspore
  - b. a male gametophyte
  - c. a megasporangium on a stick
  - d. an egg cell inside a protective layer
  - e. an integumented megasporangium
34. Pollen constitutes
  - a. endosporic female gametophytes

- b. endosporic male gametophytes
  - c. integumented microsporangia
  - d. meiospores
  - e. seed plant sperm
35. A typical seed plant seed consists of \_\_\_ generations: \_\_\_\_\_
- a. 1 ... a gametophyte only
  - b. 2 ... an embryonic gametophyte and its gametophyte parent
  - c. 3 ... an embryonic sporophyte, its gametophyte parent, and its sporophyte grandparent
  - d. 4 ... an embryonic gametophyte, its sporophyte parent, its gametophyte grandparent, and its sporophyte great-grandparent.
  - e. 5 ... an embryonic sporophyte, its gametophyte parent, its gametophyte grandparent, its sporophyte great-grandparent, and its uncle from Arizona
36. The opening in the integument of an ovule through which the pollen passes is called the
- a. megaphyll
  - b. megapyle
  - c. microphyll
  - d. micropyle
  - e. microspore
37. The cells of a seed plant pollen grain that are not the generative cell are called
- a. procyonid cells
  - b. proembryonic cells
  - c. prosenchyma cells
  - d. prothallial cells
  - e. protonematic cells
38. The function of the pollen tube common to **all** seed plants is
- a. absorbing nutrients
  - b. breaking open the microsporangium
  - c. carrying sperm cells to the archegonium
  - d. growing from the stigma down to the ovule
  - e. meiosis

39. Sperm cells of *Ginkgo* have \_\_\_ flagella.
- 0
  - 1
  - 2
  - 4-8
  - more than 12
40. The pollination drop is produced by
- the megasporophyll
  - the microsporangium
  - the nucellus
  - the pollen grain
  - the sperm cells
41. The compound megasporangiate strobilus (seed cone) of a conifer is homologous to
- a cluster of microsporangiate strobili of a conifer
  - a flower
  - a single microsporangiate strobilus of a conifer
  - the megasporangiate strobilus of a cycad
  - the oogonium of *Chara*
42. You are trapped inside one of the cotyledons of a cycad embryonic sporophyte within a seed. You have been provided with a small, exceedingly sharp sword and must hack your way out. Name the layers you will cross in order to reach freedom (not including the cotyledon you are already in).
- archegonium, antheridium, meiosporangium, perithecium, ascus
  - endosperm, nucellus, inner integument, outer integument, pericarp
  - female gametophyte, megasporangium, megaspore cell wall, sarcotesta, sclerotesta
  - female gametophyte, megaspore cell wall, megasporangium, sclerotesta, sarcotesta
  - nucellus, endosperm, megaspore cell wall, integument, pericarp
43. Which tissue is haploid?
- endosperm
  - female gametophyte
  - integument
  - megasporangium
  - nucellus
44. In flowering plants, ovules are located inside the
- antheridium
  - archegonium
  - petal
  - pistil
  - stamen

45. In flowering plants, pollen germinates
- in the egg cell
  - in the micropyle
  - in the pollen chamber
  - on the stigma
  - on the style
46. The most widespread and ecologically important group of terrestrial plants is the
- conifers
  - cycads
  - ferns
  - flowering plants
  - mosses
47. Seeds and pollen together provide an important and novel adaptation:
- embryonic sporophytes
  - endosporic gametophytes
  - fully internal fertilization
  - megaphylls
  - vascular tissue
48. In bisexual free-living gametophytes (such as those of ferns), the archegonia and antheridia often develop at different times. The most important purpose of this is to
- allow the gametophyte to become larger
  - extend the breeding season
  - facilitate photosynthesis
  - force the sperm cells to wait for the next available archegonium
  - prevent self-fertilization
49. You are taking a lab exam. The card says "Identify the type of stele found in this root." Unfortunately, the illuminator on the microscope is burned out, and the slide's label is covered, so you don't know what kind of plant it is. You have to guess at the answer; only 15 seconds left, so hurry!
- It is almost certainly a eustele
  - It is almost certainly a phycostele
  - It is almost certainly a protostele
  - It is almost certainly a siphonostele
  - There is no way to know; it could be anything
50. The next station in the lab exam is a sectioned *Ginkgo* seed. The card says "What is the name of the haploid structure at the pointer?" But the pointer is missing. What is the right answer?
- embryo
  - female gametophyte
  - nucellus
  - sarcotesta
  - sclerotesta