

BOT 125 - Plant Morphology Fall 1995, Final

1. **Read these directions before you begin.**
2. Write your name on your Scantron sheet (**tests without names will not be graded**).
3. Write your **lab** section on the Scantron sheet (sect. 1 = TTh 1-4, sect. 2 = TTh 4-7). **Scantrons without lab sections will have one point deducted from the total.**
4. Check this test to make sure it has all pages, 1-9.
5. Mark all answers on the Scantron sheet. There is *only one* correct answer to each question.
6. When you are finished, turn in the Scantron on the front table. ***Please keep this sheet.***

1. _____ are never flagellated.
 - a. Anthophyta sperm cells
 - b. Cycadophyta sperm cells
 - c. Ginkgophyta sperm cells
 - d. Psilophyta sperm cells
 - e. Pterophyta sperm cells
2. _____ are always diploid.
 - a. antipodal cells
 - b. megaspores
 - c. megasporocytes
 - d. pollen grains
 - e. synergids
3. _____ are always haploid.
 - a. microsporocytes
 - b. nucellus cells
 - c. prothallial cells
 - d. sarcotesta cells
 - e. zygotes
4. A bract
 - a. is a cone scale
 - b. is a fascicle of needles
 - c. is a modified leaf
 - d. is a rhizoid
 - e. is a spur shoot
5. A pollen grain is
 - a. a microspore
 - b. a sperm cell of a seed plant
 - c. an endosporic male gametophyte
 - d. an exosporic male gametophyte
 - e. an integumented microsporangium

6. A seed plant has tiny, bract-like leaves and photosynthetic stems. It has fruits, so it must be a member of the division
 - a. Anthophyta
 - b. Coniferophyta
 - c. Gnetophyta
 - d. Psilophyta
 - e. Pterophyta
7. A single megasporangiate strobilus (seed cone) of a cycad is homologous (equivalent) to
 - a. a cluster of flowers
 - b. a cluster of microsporangiate strobili of a conifer
 - c. a single microsporangiate strobilus of a cycad
 - d. the compound megasporangiate strobilus of a conifer
 - e. the oogonium of *Chara*
8. A typical seed consists of ___ generation(s): _____.
 - 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 stepfather from Staten Island
9. An ovule can best be described as
 - a. a female gametophyte
 - b. a megaspore on a stick
 - c. an egg cell inside an archegonium
 - d. an immature fruit
 - e. an integumented megasporangium
10. Endosporic gametophytes are found in *all* members of the
 - a. Bryophyta
 - b. Coniferophyta
 - c. Lycophyta
 - d. Psilophyta
 - e. Pterophyta
11. Gametophytes of heterosporous Pterophyta
 - a. are bisexual
 - b. are endosporic
 - c. are free-living and photosynthetic
 - d. have phloem and xylem
 - e. never have archegonia
12. In Anthophyta, ovules are located inside the
 - a. anther
 - b. archegonium
 - c. cone scale
 - d. megasporangium
 - e. ovary

13. In bisexual free-living gametophytes (such as those of *Equisetum*), the antheridia and archegonia often develop at different times. The most important purpose of this is to
 - a. extend the breeding season
 - b. give the sperm cells the opportunity to turn into new gametophytes
 - c. prevent self-fertilization
 - d. prevent self-pollination
 - e. reduce generation time
14. In cycads, pollen tubes begin their growth
 - a. in the archegonium
 - b. in the micropyle
 - c. in the pollen chamber
 - d. on the stigma
 - e. on the style
15. In flowering plants, pollen tubes begin their growth
 - a. in the egg cell
 - b. in the micropyle
 - c. in the pollen chamber
 - d. on the stigma
 - e. on the style
16. In vascular plants, food-conducting cells are called
 - a. hydroids
 - b. leptoids
 - c. sieve cells
 - d. stomata
 - e. tracheids
17. Indusia
 - a. always cover the ovules
 - b. are associated with sori
 - c. are associated with sporangiophores
 - d. are compound microsporangiate strobili
 - e. occur in all ferns
18. Insect pollination
 - a. is common in conifers
 - b. is found in *all* flowering plants
 - c. is never found in flowering plants
 - d. promotes hybridization
 - e. reduces hybridization
19. Organisms of the division Chlorophyta
 - a. always have multicellular gametophytes
 - b. have chitin cell walls
 - c. have chlorophyll b and β -carotene
 - d. have non-flagellated sperm cells
 - e. store food as laminarin
20. Pollen and seeds together provide an important and novel adaptation:
 - a. embryonic sporophytes
 - b. endosporic gametophytes
 - c. fully internal fertilization
 - d. the ability to live on land
 - e. vascular tissue

21. Sori
 - a. are located on sporangiophores
 - b. are located on the upper surfaces of the leaves of eusporangiate ferns
 - c. are only found in heterosporous ferns
 - d. are produced inside meiosporangia
 - e. contain meiosporangia
22. Sperm cells of the Anthophyta have ___ flagella.
 - a. 0
 - b. 1
 - c. 2
 - d. 4-8
 - e. more than 12
23. Thallose liverworts
 - a. are heterosporous
 - b. are more common in the tropics, less common in temperate regions
 - c. have midribs on their leaves
 - d. produce sporophytes with long setae and peristomes
 - e. produce sporophytes with short setae and elaters
24. The Anthocerotopsida
 - a. are called "liverworts"
 - b. are called "mosses"
 - c. have air-filled intercellular spaces in their gametophytes
 - d. have elaters
 - e. have single-celled sporophytes
25. The best evidence for the amount of evolutionary kinship between any two organisms is
 - a. how primitive or advanced they are
 - b. the homologies they share
 - c. their food storage materials
 - d. their place in the classification in the book
 - e. their similar fossils
26. The calyptra of Muscopsida
 - a. consists of haploid cells
 - b. consists of short filaments of diploid cells
 - c. contains conductive cells
 - d. is an important adaptation for spore dispersal
 - e. is the remains of the antheridium
27. The cells found in most seed plant pollen grains, but absent in the Anthophyta, are called
 - a. antipodal cells
 - b. microsporocytes
 - c. prothallial cells
 - d. synergids
 - e. tube nuclei
28. The center of the stems of Sphenophyta is ordinarily filled with
 - a. a continuous column of parenchyma cells
 - b. air
 - c. cortex
 - d. dirt
 - e. vascular tissue

29. The common food storage product of the Psilophyta is
 - a. floridean starch
 - b. glycogen
 - c. mannitol
 - d. paramylon
 - e. starch
30. The common food transport product of the Ginkgophyta is
 - a. glycogen
 - b. lipid
 - c. mannitol
 - d. paramylon
 - e. sucrose
31. The dicots (Class Magnoliopsida) are paraphyletic because
 - a. their common ancestor is also the ancestor of the monocots
 - b. they are more closely related to birds than they are to lizards
 - c. they are more closely related to gymnosperms than they are to angiosperms
 - d. they have no common ancestor
 - e. they have two cotyledons
32. The *least* abundant and ecologically dominant division of seed plants is the
 - a. Anthophyta
 - b. Coniferophyta
 - c. Cycadophyta
 - d. Ginkgophyta
 - e. Gnetophyta
33. The *second most* abundant and ecologically dominant division of seed plants is the
 - a. Anthophyta
 - b. Coniferophyta
 - c. Cycadophyta
 - d. Ginkgophyta
 - e. Gnetophyta
34. The function of the pollen tube common to *all* seed plants is
 - a. growing from the stigma down the style to the ovule
 - b. growing through the micropyle
 - c. meiosis
 - d. nutrient absorption
 - e. transporting sperm cells to the egg
35. 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
36. The progymnosperms (the ancient group of plants that gave rise to the seed plants)
 - a. are represented today by the Ophioglossophyta
 - b. had no secondary growth
 - c. produced compound strobili
 - d. produced seeds
 - e. were always heterosporous

37. The roots of Psilophyta
- come from branching rhizomes
 - don't exist
 - form a taproot system
 - have protosteles
 - have rhizoids
38. The single living species of the Ginkgophyta is
- Ginkgo acaulis*
 - Ginkgo biloba*
 - Ginkgo infestans*
 - Ginkgodendron ornatum*
 - Gnetum antisiphiliticum*
39. The sporangia of the Pterophyta are borne on
- cone scales
 - dichotomizing photosynthetic stems
 - megaphylls
 - microphylls
 - sporangiophores
40. The sterile jacket of the oogonium of *Chara* is probably an adaptation
- to allow colonization of the land
 - to prevent fertilization
 - to produce vascular tissue
 - to protect the zygote
 - to provide nutrients to the developing sporophyte
41. The structure at the opening of a moss capsule that consists of teeth that flex with changes in humidity is called a
- calyptra
 - elater
 - operculum
 - peristome
 - seta
42. *Volvox* of the Chlorophyta is
- a hollow, spherical colony
 - a single large multinucleate cell with many flagella
 - a stage leading to multicellular animals
 - a stage leading to the multicellular Plantae
 - the closest relative of the Bryophyta
43. We know that the vascular plants are a monophyletic group (they all descend from a common ancestor) because they all have
- endosporic gametophytes
 - flowers
 - non-motile sperm
 - seeds
 - xylem

44. You are taking a lab exam. The card says “What division does this endosporic gametophyte belong to?” There is a microscope, but, strangely, the slide is missing. The correct answer is:
- Anthophyta
 - Coniferophyta
 - Lycophyta
 - Pterophyta
 - there is no way to know
45. You are taking a lab exam. The next station is a sectioned cycad 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
46. You are taking a lab exam. The slide is labeled “*Encephalartos*” and the question is “What is the ploidy level of the nucellus at the pointer. What should you answer?”
- diploid
 - haploid
 - no answer—we don’t have to know genera, and without the Division, there is no way to know the ploidy level.
 - seed
 - sterile jacket
47. You are trapped inside one of the cotyledons of a conifer embryonic sporophyte within a seed. You have been provided with a dull razor blade 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, integument
 - female gametophyte, megaspore cell wall, megasporangium, integument
 - nucellus, endosperm, megaspore cell wall, integument, pericarp
48. You are trapped inside the Climatron (a large greenhouse) at Missouri Botanical Garden (in St. Louis) over a long holiday weekend. While searching for food, you find the rare “double coconut” tree, and break open one of its seeds. You hungrily scoop out the sweet endosperm. The tissue you are eating is
- haploid
 - diploid
 - triploid
 - haploid and diploid
 - haploid and triploid
49. The “rain machine” turns on and you take shelter under the broad leaves of a tree fern. You sneeze as spores drift down from its leaves. The leaves are part of a _____ and the spores are formed by _____.
- gametophyte . . . meiosis
 - gametophyte . . . mitosis
 - seaweed . . . spontaneous generation
 - sporophyte . . . meiosis
 - sporophyte . . . mitosis

50. You finally manage to turn off the rain by poking at a valve with a long pole made of wood. The pole was probably made from a member of the
- a. Bryophyta
 - b. Psilophyta
 - c. Pterophyta
 - d. seed plants
 - e. Sphenophyta