

**BOT 125 - Plant Morphology
Winter 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 = MW 12-3, sect. 2 = MW 3-6).
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 **always** haploid.
 - a. Archegonium jacket cells
 - b. Cotyledons
 - c. Nucelli
 - d. Sepals
 - e. Sporophylls
2. _____ are **always** diploid.
 - a. Megaspores
 - b. Polar nuclei
 - c. Pollen grains
 - d. Radicles
 - e. Synergid cells
3. _____ are **always** flagellated.
 - a. Anthophyta sperm cells
 - b. Coniferophyta sperm cells
 - c. Egg cells
 - d. Gnetophyta sperm cells
 - e. Lycopphyta sperm cells
4. A pollen grain is
 - a. a microspore
 - b. a sperm cell of a seed plant
 - c. an endosporic female gametophyte
 - d. an endosporic male gametophyte
 - e. an exosporic male gametophyte
5. A seed plant has needle leaves. It has fruits, so it is most likely a member of the division
 - a. Anthophyta

- b. Coniferophyta
 - c. Cycadophyta
 - d. Psilophyta
 - e. Pterophyta
6. A similarity between the Rhodophyta and Phaeophyta is that virtually all members of both groups
- a. are unicellular
 - b. have brown plastids
 - c. have chitin cell walls
 - d. have free-living meiospore-producing sporophytes
 - e. have no flagella
7. A typical seed consists of ____ generation(s): _____
- a. 1 ... a gametophyte only
 - b. 2 ... an embryonic gametophyte and its sporophyte 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 nephew from Northridge.
8. Agar comes from _____ and is used for _____.
- a. Bryophyta . . . solubilizing paints
 - b. Phaeophyta . . . food products
 - c. Phaeophyta . . . preventing aflatoxin in peanuts
 - d. Rhodophyta . . . supporting growth media for culturing microorganisms
 - e. Rhodophyta . . . stabilizing the foam in cola beverages
9. An ovule can best be characterized as
- a. a female gametophyte
 - b. a megaspore on a stick
 - c. an egg cell inside a protective layer
 - d. an immature fruit
 - e. an integumented megasporangium
10. Endosporic gametophytes are found in *all* members of the
- a. Bryophyta
 - b. Gnetophyta
 - c. Lycophyta
 - d. Psilophyta
 - e. Pterophyta

11. Gametophytes of heterosporous Lycophyta
 - a. are bisexual
 - b. are endosporic
 - c. are free-living and photosynthetic
 - d. have phloem and xylem
 - e. never have antheridia
12. In a Cycadophyta pollen grain, the cells that are *not* the generative cell are called
 - a. prosenchymatous cells
 - b. prothallial cells
 - c. prothonian cells
 - d. protoembryonic cells
 - e. protonematic cells
13. In bisexual free-living gametophytes (such as those of Pterophyta), the archegonia and antheridia often develop at different times. The most important purpose of this is to
 - a. force the sperm cells to wait for the next available archegonium
 - 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 conifers, 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 *Ectocarpus*, unilocular sporangia produce
 - a. diploid asexual spores
 - b. diploid meiospores
 - c. gametes
 - d. haploid asexual spores
 - e. haploid meiospores
16. In flowering plants, ovules are located inside the
 - a. anther
 - b. archegonium
 - c. megasporangium
 - d. ovary
 - e. synangium

17. In kelps, zygotes
 - a. are haploid
 - b. are produced in meiosporangia
 - c. develop into filamentous multicellular gametophytes
 - d. develop into large multicellular sporophytes
 - e. divide once to become gametes
18. In the center of an *Equisetum* stem is ordinarily
 - a. a column of parenchyma cells
 - b. a hollow space
 - c. a strand of xylem
 - d. soil
 - e. vacuum
19. In the Muscopsida, the peristome
 - a. consists of diploid cells
 - b. contains conductive cells
 - c. is produced by the gametophyte
 - d. is the remains of the archegonium
 - e. falls off the capsule before the spores are released
20. In the Rhodophyta, carposporophytes
 - a. come from carpospores
 - b. come from tetraspores
 - c. come from zygotes
 - d. produce carpospores by meiosis
 - e. produce gametes by mitosis
21. Indusia
 - a. are associated with sori
 - b. are associated with sporangiophores
 - c. are clusters of microsporangia
 - d. are made of haploid tissue
 - e. occur in all ferns
22. Thallose liverworts
 - a. are less common in the tropics, more common in temperate regions
 - b. have gametophytes with meiosporangia
 - c. have midribs on their leaves
 - d. have true stomata
 - e. produce sporophytes with long setae and peristomes
23. Organisms of the division Chlorophyta
 - a. always have multicellular gametophytes
 - b. have chlorophyll b and β -carotene
 - c. have non-flagellated sperm cells
 - d. have chitin cell walls
 - e. store food as mannitol

24. Parenchyma tissue is not found in the gametophytes of the
- Bryophyta
 - Lycophyta
 - Phaeophyta
 - Anthophyta
 - Psilophyta
25. Pollen and seeds together provide an important and novel adaptation:
- embryonic sporophytes
 - endosporic gametophytes
 - fully internal fertilization
 - the ability to live on land
 - vascular tissue
26. Sori
- always have indusia
 - are located on the upper surfaces of the sporophylls
 - are only found in heterosporous ferns
 - are the same as meiosporangia
 - contain meiosporangia
27. Sperm cells of the Anthophyta have ___ flagella.
- 0
 - 1
 - 2
 - 4-8
 - more than 12
28. The Anthocerotopsida
- are called “liverworts”
 - are called “mosses”
 - have conductive cells in their gametophytes
 - have mucilage-filled intercellular spaces in their gametophytes
 - have single-celled sporophytes
29. The common food transport product of the Anthophyta is
- floridean starch
 - glycogen
 - laminarin
 - mannitol
 - sucrose
30. 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 strobilus of the Lycophyta

31. The dicots (Class Magnoliopsida) are paraphyletic because
- their common ancestor is also the ancestor of the monocots
 - they are more advanced than the gymnosperms
 - they are more closely related to gymnosperms than they are to angiosperms
 - they have no common ancestor
 - they have two cotyledons
32. The single living species of the Ginkgophyta is
- Ginkgo biloba*
 - Ginkgo cerevisiae*
 - Gnetum antisiphiliticum*
 - Ginkgophyton ornatum*
 - Ginkgo microsporangia*
33. The division Phaeophyta
- consists of organisms that play an important ecological role in the rocky intertidal zone.
 - contains more than 500,000 species
 - contains more unicellular than multicellular species
 - is the closest relative to the kingdom Plantae
 - is the source of all edible seaweed and seaweed products
34. The *least* abundant and ecologically dominant division of seed plants is the
- Coniferophyta
 - Cycadophyta
 - Ginkgophyta
 - Gnetophyta
 - Pterophyta
35. The function of the pollen tube common to *all* seed plants is
- growing from the stigma down the style to the ovule
 - growing through the micropyle
 - nutrient absorption
 - producing the pollination drop
 - transporting sperm cells to the egg
36. The haploid structure that covers a moss capsule is called a(n)
- calyptra
 - elater
 - operculum
 - peristome
 - seta
37. The opening in the integument of an ovule through which the pollen passes is called the
- megaphyll
 - megapyle
 - microphyll
 - micropyle
 - microspyll

38. The pollination drop is produced by
- the egg cell
 - the megasporangium (nucellus)
 - the megasporophyll
 - the microsporangium
 - the pollen grain
39. The progymnosperms (the group of extinct plants that gave rise to the seed plants)
- had secondary xylem
 - produced compound strobili
 - produced flowers
 - produced seeds
 - were always heterosporous
40. The sporangia of the Sphenophyta are borne on
- cone scales
 - dichotomizing photosynthetic stems
 - megaphylls
 - microphylls
 - sporangiophores
41. The sterile jacket of the oogonium of *Chara* most likely benefits the organism by
- allowing it to colonize of the land
 - preventing fertilization
 - producing vascular tissue
 - protecting the zygote
 - providing nutrients to the developing sporophyte
42. The structure at the opening of a moss capsule that consists of teeth that flex with changes in humidity is called a
- periblem
 - pericarp
 - perigynium
 - perispore
 - peristome
43. The structure in rockweeds such as *Fucus* that contains the gametangia is called the
- conceptacle
 - cystocarp
 - paraphysis
 - plurilocular sporangium
 - receptacle

44. *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
45. Food-conducting cells in Phaeophyta are called
- hydroids
 - leptoids
 - stomata
 - tracheids
 - trumpet cells
46. We can always recognize the evolutionary kinship between any two organisms by
- how primitive or advanced they are
 - the homologies they share
 - their photosynthetic pigments
 - their place in the classification in the book
 - their similar fossils
47. We know that the flowering plants are a monophyletic group (they all descend from a common ancestor) because they all have
- endosporic gametophytes
 - flowers
 - non-motile sperm
 - seeds
 - xylem
48. You are taking a lab exam. The card says “What is the name of the structure surrounding these ovules.” Unfortunately, the illuminator on the microscope is burned out, and the slide’s label only says “Dicot”. You have to guess at the answer; only 20 seconds left, so hurry!
- It is a cone scale
 - It is a microsporangium
 - It is a nucellus
 - It is an ovary
 - There is no way to know; it could be anything
49. 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 pointer?” But the pointer is missing. What is the right answer?
- embryo
 - female gametophyte
 - nucellus
 - sarcotesta
 - sclerotesta

50. 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).
- a. archegonium, antheridium, meiosporangium, perithecium, ascus
 - b. endosperm, nucellus, inner integument, outer integument, pericarp
 - c. female gametophyte, megasporangium, megaspore cell wall, integument
 - d. female gametophyte, megaspore cell wall, megasporangium, integument
 - e. nucellus, endosperm, megaspore cell wall, integument, pericarp

Follow these directions in order:

- A. Write your name on your scantron sheet.
- B. Write your lab section number on your scantron sheet (Section 1 = 1 pm-4 pm, Section 2 = 4 pm-7 pm, Section 3 = 7 pm-10 pm)
- C. Answer the questions below, marking the correct answers on your scantron sheet. There is *only one* correct answer to each question.
- D. When you are finished, turn in the scantron on the front table. ***Please keep this sheet.***