

BOT 125 - Plant Morphology

Summer 1998, 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 "cheat sheet" (tests without names will not be graded).
3. Write your *lab* section on the Scantron sheet in the box marked "hour" (sect. 1 = TTh 3-6, sect. 2 = MW 9-12). Scantrons without lab sections will have one point deducted from the total.
4. Check this test to make sure it has all pages, 1-4.
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 "cheat sheet" on the front table. *Please keep this sheet.*

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1. _____ are never flagellated.
 - a. Anthophyta sperm cells
 - b. Bryophyta sperm cells
 - c. Cycadophyta sperm cells
 - d. Ginkgophyta sperm cells
 - e. Pterophyta sperm cells
 2. _____ are always diploid.
 - a. gametangia
 - b. green photosynthetic cells
 - c. rhizoids
 - d. sporophylls
 - e. thalli
 3. _____ are always diploid.
 - a. antipodal cells
 - b. microspores
 - c. pollen grains
 - d. sarcotesta cells
 - e. triple fusion nuclei
 4. _____ are always haploid.
 - a. generative nuclei
 - b. meiocytes
 - c. nucellus cells
 - d. sarcotesta cells
 - e. zygotes
 5. _____ are always haploid.
 - a. antheridiophores
 - b. elaters
 - c. guard cells
 - d. setae (bryophyte stalks)
 - e. sporangiophores
 6. A pollen grain is
 - a. a microsporocyte
 - b. an endosporic male gametophyte
 - c. an exosporic female gametophyte
 - d. an integumented microsporangium
 - e. a seed plant sperm cell
 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 *abuela* from Acapulco.
 8. After fertilization in a typical flowering plant (Division Anthophyta), the female gametophyte
 - a. becomes diploid
 - b. consists of eight cells and seven nuclei
 - c. dies
 - d. nourishes the developing embryonic sporophyte
 - e. turns into the ovary
 9. 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 gametes
 - c. It increases the number of archegonia per gamete
 - d. It prevents self-fertilization
 - e. It transports rhizoids to the elaters
 10. An integument turns into a seed coat, and an ovary turns into a
 - a. fruit
 - b. megaspore cell wall
 - c. nucellus
 - d. sarcotesta
 - e. sterile jacket
 11. An ovule can best be described as
 - a. a female gametophyte
 - b. a megaspore in a pericarp
 - c. an egg cell inside an archegonium
 - d. an egg in an ovary
 - e. an integumented megasporangium

12. An unknown seed plant has fruits, so it must be a member of the division
- Anthophyta
 - Coniferophyta
 - Gnetophyta
 - Psilophyta
 - Pterophyta
13. 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
14. *Chara* of the Charophyceae is notable for its
- diploid-dominant life cycle
 - lack of chloroplasts
 - multicellular gametangia
 - stomata
 - true parenchyma
15. Each sperm cell of a plant in the Anthophyta has ____ flagella.
- 0
 - 1
 - 2
 - 4-8
 - more than 12
16. Endosporic female gametophytes provide food to the developing embryonic sporophytes. Where do they get it?
- by parasitizing fungi
 - from photosynthesis
 - Hughes . . . uh, no, it's Ralphs now
 - stored food from the large megaspore
 - they steal it from the embryonic sporophyte
17. Endosporic male gametophytes are found in *all* members of the
- Bryophyta
 - Cycadophyta
 - Hepatophyta
 - Lycophyta
 - Pterophyta
18. In Anthophyta, water-conducting cells are called
- hydroids
 - leptoids
 - sieve cells
 - stomata
 - tracheids
19. In Bryophyta, food-conducting cells are called
- hydroids
 - leptoids
 - sieve cells
 - stomata
 - tracheids
20. In Coniferophyta, 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
21. In endospermous seeds, food is stored
- in the cotyledons
 - in the endosperm
 - in the female gametophyte
 - in the nucellus
 - in the style and stigma
22. 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
23. In the Division Anthophyta, microsporangia are clustered together in structures called
- anthers
 - ovaries
 - sepals
 - sori
 - stamens
24. In the Rhodophyta, carposporophytes
- come from carpospores
 - come from tetraspores
 - produce carpospores by mitosis
 - produce gametes by meiosis
 - produce tetraspores by mitosis
25. Insect pollination
- always requires nectar
 - is common in conifers
 - is found in many flowering plants
 - is harmful to plants
 - is never found in flowering plants
26. Kelps have phloem
- to provide strength to the stipes
 - to store food for harsh times
 - to transport air to the holdfasts
 - to transport food to the holdfast and growing stipes
 - to transport water to the leaves
27. Most land plants are protected from ultraviolet radiation by chemical compounds called
- flavonoids
 - lignins
 - mannitols
 - cuticles
 - stomata

28. Not counting the seed plants, most land plants reproduce by
- asexual spores
 - carpospores
 - meiospores
 - pollen grains
 - seeds
29. Organisms that are K-selected
- always exceed the carrying capacity of the environment
 - are usually weeds
 - produce few offspring and care for them well
 - produce large numbers of low-cost offspring
 - usually live in highly disturbed habitats
30. Seeds and pollen together provide an important and novel adaptation:
- completely internal fertilization
 - embryonic sporophytes
 - endosporic gametophytes
 - the ability to live on land
 - vascular tissue
31. The single living species of the Ginkgophyta is
- Ginkgo antisiphiliticum*
 - Ginkgo biloba*
 - Ginkgo cerevisiae*
 - Ginkgo flavus*
 - Ginkgo infestans*
32. Tetraspores come from _____ and give rise to _____.
- carposporophytes . . . gametophytes
 - carposporophytes . . . tetrasporophytes
 - gametes . . . carposporophytes
 - tetrasporophytes . . . carposporophytes
 - tetrasporophytes . . . gametophytes
33. The Anthocerophyta
- are called “hornworts”
 - are called “mosses”
 - are called “stoneworts”
 - have air-filled intercellular spaces in their gametophytes
 - have no gametophytes
34. 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
 - lignin
 - peptidoglycan
 - silica
 - sucrose
35. The cells found in Coniferophyta pollen grains and absent in Anthophyta pollen grains are called
- antipodal cells
 - microsporocytes
 - prothallial cells
 - synergids
 - tube nuclei
36. The common food storage product of the Bryophyta is
- floridean starch
 - glycogen
 - laminarin
 - paramylon
 - starch
37. The common food transport product of the Anthophyta is
- glycogen
 - lipid
 - mannitol
 - paramylon
 - sucrose
38. The dominant photosynthetic organisms in the Sargasso Sea are species of *Sargassum*, members of the
- Anthophyta
 - Chlorophyta
 - Chrysophyta
 - Phaeophyta
 - Rhodophyta
39. The gametophyte of a brown alga with isomorphic alternation of generations is parenchymatous. The sporophyte will always be
- diploid-dominant
 - filamentous
 - haploid
 - larger
 - parenchymatous
40. The Magnoliopsida
- all have parallel leaf venation
 - are also called the Monocotyledonae
 - are monophyletic because they all have two cotyledons
 - are more closely related to ferns than they are to flowering plants
 - have a common ancestor that is also an ancestor of the Liliopsida
41. The opening in the integument of an ovule through which the pollen passes is called the
- megapyle
 - meiophyll
 - microphyll
 - micropyle
 - microspore
42. 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

43. The vascular cambium is responsible for forming
- pith
 - primary xylem
 - secondary phloem
 - the eustele
 - the integument
44. Unlike the rest of the Phaeophyta, the rockweeds such as *Fucus*
- are always floating free in the ocean
 - are diploid-dominant
 - are found in fresh water only
 - are haploid-dominant
 - are non-photosynthetic
45. 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
46. You are eating Frooty Kustard Krems partially-thawed nutrition-free artificially red-flavored milk-like dessert (“It’s the Seaweed™”). You would not be surprised to find that it owes its creamy texture to _____ obtained from _____.
- agar . . . Phaeophyta
 - alginic acid . . . Chlorophyta
 - carrageenan . . . Rhodophyta
 - floridean starch . . . Rhodophyta
 - mannitol . . . Phaeophyta
47. You are reading an article in *American Journal of Botany* about a newly discovered Division of seed plants. They have many unique features, but you are *not* surprised to find that they
- are homosporous
 - have a haploid integument
 - have diploid gametophytes
 - have endosporic gametophytes
 - have no vascular tissue in their sporophytes
48. You are sampling algae in a pond much like the Cal Poly duck pond (except that it has geese instead of ducks). The majority of the algae have cellulose cell walls and store starch. They are members of the division
- Bryophyta
 - Chlorophyta
 - Chrysophyta
 - Euglenophyta
 - Phaeophyta
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 pin?” But the pin is missing. What is the right answer?
- embryo
 - female gametophyte
 - nucellus
 - sarcotesta
 - sclerotesta
50. You are trapped inside one of the cotyledons of a *Ginkgo* 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, megaspore cell wall, papery layer, nucellus, sarcotesta, sclerotesta
 - endosperm, nucellus, inner integument, outer integument, pericarp
 - female gametophyte, megaspore cell wall, nucellus, papery layer, sclerotesta, sarcotesta
 - female gametophyte, papery layer, nucellus, megaspore cell wall, sclerotesta, sarcotesta