

BOT 125 - Plant Morphology

Fall 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 = MW 3-6, sect. 2 = TTh 1-4). **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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| <ol style="list-style-type: none">1. ____ are never flagellated.<ol style="list-style-type: none">a. Anthophyta sperm cellsb. Bryophyta sperm cellsc. Cycadophyta sperm cellsd. Ginkgophyta sperm cellse. Pterophyta sperm cells2. ____ ordinarily have two flagella located in grooves on the cell wall<ol style="list-style-type: none">a. Acrasiomycotab. Cyanobacteriac. Euglenophytad. Pyrrhophytae. Zygomycota3. ____ are always diploid.<ol style="list-style-type: none">a. antipodal cellsb. microsporesc. pollen grainsd. sarcotesta cellse. triple fusion nuclei4. ____ are always haploid.<ol style="list-style-type: none">a. meiocytesb. tube nucleic. zygotesd. elaterse. sporangiophores5. A pollen grain is<ol style="list-style-type: none">a. a microsporeb. an endosporic male gametophytec. an exosporic female gametophyted. an integumented microsporangiume. a seed plant sperm cell | <ol style="list-style-type: none">6. A typical seed consists of ____ generation(s): ____.<ol style="list-style-type: none">a. 1 ... a gametophyte onlyb. 2 ... an embryonic gametophyte and its sporophyte parentc. 3 ... an embryonic sporophyte, its gametophyte parent, and its sporophyte grandparentd. 4 ... an embryonic gametophyte, its sporophyte parent, its gametophyte grandparent, and its sporophyte great-grandparente. 5 ... an embryonic sporophyte, its gametophyte parent, its gametophyte grandparent, its sporophyte great-grandparent, and its <i>babushka</i> from Belarus.7. After fertilization in a typical flowering plant (Division Anthophyta), the female gametophyte<ol style="list-style-type: none">a. becomes diploidb. consists of eight cells and seven nucleic. diesd. nourishes the developing embryonic sporophytee. turns into the ovary8. Among the divisions with brown plastids, the ____ have members with the most complex multicellular sporophytes.<ol style="list-style-type: none">a. Chrysophytab. Oomycotac. Phaeophytad. Pyrrhophytae. Rhodophyta9. An <i>Ectocarpus</i> (Phaeophyta: isomorphic group) sporophyte<ol style="list-style-type: none">a. may have unilocular sporangiab. will always have unilocular sporangiac. will never be diploidd. will never have plurilocular sporangiae. will never have unilocular sporangia |
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10. An important feature of the vascular plants is free-living sporophytes. Why is this feature important?
- It allows the sporophytes to become large enough to branch and produce more meiosporangia
 - It eliminates the need for gametes
 - It increases the number of archegonia per gamete
 - It prevents self-fertilization
 - It transports rhizoids to the elaters
11. An integument turns into a seed coat, and an ovary turns into a
- fruit
 - megaspore cell wall
 - nucellus
 - sarcotesta
 - sterile jacket
12. An organism has silica in its cell walls and brown plastids. It is most likely a member of the division
- Chrysophyta
 - Euglenophyta
 - Oomycota
 - Phaeophyta
 - Rhodophyta
13. An ovule can best be described as
- a female gametophyte
 - a megaspore in a fruit
 - an egg cell inside an archegonium
 - an egg in an ovary
 - an integumented megasporangium
14. An unknown seed plant has fruits, so it must be a member of the division
- Anthophyta
 - Coniferophyta
 - Gnetophyta
 - Psilophyta
 - Pterophyta
15. 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
16. Because their eyespots are _____, euglenas are insensitive to _____ light.
- - blue . . . red
 - colorless . . . white
 - red . . . blue
 - red . . . red
17. Carpospores come from _____ and give rise to _____.
- carposporophytes . . . gametophytes
 - carposporophytes . . . tetrasporophytes
 - gametes . . . carposporophytes
 - tetrasporophytes . . . carposporophytes
 - tetrasporophytes . . . gametophytes
18. Cyanobacteria that are symbiotic in plants provide _____ and get _____ in return
- fixed nitrogen . . . light, protection, and nutrients
 - fixed nitrogen . . . nothing
 - food . . . light
 - food . . . nothing
 - nothing . . . light, protection, and nutrients
19. Endosporic male gametophytes are found in **no** members of the
- Coniferophyta
 - Cycadophyta
 - Hepatophyta
 - Lycophyta
 - Pterophyta
20. In Anthophyta, ovules are located inside the
- anther
 - archegonium
 - cone scale
 - megasporangium
 - ovary
21. In Coniferophyta, water-conducting cells are called
- hydroids
 - leptoids
 - sieve cells
 - stomata
 - tracheids
22. 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
23. In heterosporous ferns such as *Marsilea*, gametophytes
- always have meiosporangia
 - are bisexual
 - are endosporic
 - are free-living and photosynthetic
 - have phloem and xylem
24. 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

25. In rockweeds such as *Fucus*, the _____ (swollen branch tips) often contain chambers called _____.
- antheridia . . . receptacles
 - gametophytes . . . gametangia
 - meristems . . . meiosporangia
 - oogonia . . . paraphyses
 - receptacles . . . conceptacles
26. In the Division Anthophyta, microsporangia are clustered together in structures called
- anthers
 - ovaries
 - pedicels
 - sepals
 - sori
27. In the land plants (Kingdom Plantae), _____ have sterile jackets.
- meiosporangia, antheridia, and archegonia
 - only antheridia
 - only archegonia
 - only gametangia
 - only meiosporangia
28. In the vascular plants, zygotes
- are diploid
 - are the product of meiosis
 - undergo meiosis to form meiospores
 - turn into gametophytes
 - are replaced by ovules
29. 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
30. Leafy liverworts
- are heterosporous
 - are more common in the tropics, less common in temperate regions
 - are thalloid
 - produce gametophytes with long setae and peristomes
 - produce sporophytes with long meiosporangia and elaters
31. Most land plants are protected from ultraviolet radiation by chemical compounds called
- flavonoids
 - lignins
 - mannitols
 - cuticles
 - stomata
32. 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 . . . Cyanophyta
 - Basidiomycota . . . Chlorophyta
 - Basidiomycota . . . Cyanophyta
 - Rhodophyta . . . Zygomycota
33. Not counting the seed plants, most land plants reproduce by
- asexual spores
 - carospores
 - meiospores
 - pollen grains
 - seeds
34. One piece of evidence that the lichen association is parasitic is that
- a lichen-forming fungus can attack different species of algae.
 - air pollution kills the fungi, but the algae survive.
 - lichens can be grouped as crustose, foliose, squamulose, and fruticose.
 - lichens can live anywhere.
 - the fungi can live on their own, but the algae can't.
35. 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
36. 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
37. Sori are
- clusters of meiosporangia
 - commonly located on the upper surfaces of the leaves of eusporangiate ferns
 - located on sporangiophores
 - produced inside meiosporangia
 - types of indusia
38. The single living species of the Ginkgophyta is
- Ginkgo antisiphiliticum*
 - Ginkgo biloba*
 - Ginkgo cerevisiae*
 - Ginkgo flavus*
 - Ginkgo infestans*

39. Tetraspores come from _____ and give rise to _____.
- carposporophytes . . . gametophytes
 - carposporophytes . . . tetrasporophytes
 - gametes . . . carposporophytes
 - tetrasporophytes . . . carposporophytes
 - tetrasporophytes . . . gametophytes
40. The Anthocrophyta
- are called "hornworts"
 - are called "mosses"
 - are called "stoneworts"
 - have air-filled intercellular spaces in their gametophytes
 - have no sporophytes
41. 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
42. The cells found in most seed plant pollen grains, but absent in the Anthophyta, are called
- antipodal cells
 - microsporocytes
 - prothallial cells
 - synergids
 - tube nuclei
43. The common food transport product of the Anthophyta is
- glycogen
 - lipid
 - mannitol
 - paramylon
 - sucrose
44. The gametophyte of a brown alga with isomorphic alternation of generations is parenchymatous. The sporophyte will always be
- diploid-dominant
 - filamentous
 - haploid
 - larger
 - parenchymatous
45. The opening in the integument of an ovule through which the pollen passes is called the
- megaphyll
 - meiopyle
 - microphyll
 - micropyle
 - microspore
46. The vascular cambium is responsible for forming
- pith
 - primary phloem
 - secondary xylem
 - the eustele
 - the integument
47. Which statement about the Pyrrhophyta is false?
- Some cause the red tide
 - Some eat other dinoflagellates
 - Some have brown plastids
 - Some have chitin cell walls
 - Some poison and eat fish
48. 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
 - they have a haploid nucellus
 - they have diploid gametophytes
 - they have exosporic gametophytes
 - they have no vascular tissue in their gametophytes
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, perithecius, ascus
 - endosperm, nucellus, inner integument, outer integument, pericarp
 - female gametophyte, megasporangium sterile jacket, megaspore cell wall, integument
 - female gametophyte, megaspore cell wall, megasporangium sterile jacket, integument
 - nucellus, endosperm, megaspore cell wall, integument, pericarp