

BIOLOGY 1450

Sample Final Exam (lacking diagrams to label and a genetics problem)

I. Matching (20 points).

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|---------------------------|---|
| _____ <i>Selaginella</i> | A. member of the Class Teliomycetes |
| _____ <i>Volvox</i> | B. a motile, colonial green alga |
| _____ <i>Puccinia</i> | C. a protozoan protoctist (protist) |
| _____ <i>Marchantia</i> | D. organism that produces tetrasporophytes |
| _____ <i>Lilium</i> | E. member of the Division Magnoliophyta |
| _____ <i>Polysiphonia</i> | F. a fungus producing zygosporangia |
| _____ <i>Paramecium</i> | G. a heterosporous lycopod |
| _____ <i>Ginkgo</i> | H. a member of the Chlorophyta with conjugation |
| _____ <i>Spirogyra</i> | I. a thallose liverwort |
| _____ <i>Rhizopus</i> | J. a gymnosperm with bilobed, fan-like leaves |

K. proper answer not given

II. Fill in the blanks with the correct term or terms (45 points).

1. An example of a multiple fruit is the _____.
2. The collective term for all the petals of a flower.
_____.
3. The Plant Kingdom probably arose from ancient members of the Division
_____.
4. Name a common lawn weed with only ray flowers. _____.
5. Seeds may be dormant because there may be _____
present which inhibit germination which must be leached from the
seeds by rain.

6. The tissue which nourishes the developing embryo in angiosperms is the _____.
7. The term used for the entire fruit wall is _____.
8. "Grits" are actually what part of seeds? _____.
9. What term is used to describe the single, massive cotyledon of the grass embryo?

10. The three "embryonic tissue layers" in flowering plants which give rise to the mature structure of roots and stems are the _____, the _____, and the _____.
11. What type of water-conducting cell has closed end walls and is commonly found in the gymnosperms? _____
12. Which cells of the leaf epidermis have chloroplasts?
_____.
13. The integuments of the ovule mature to become the _____ (2 words).
14. The _____ is the layer in the root which gives rise to branch (lateral) roots.
15. The arrangement of the xylem and phloem in roots is said to be "radial" while in stems it is termed _____.
16. The tunica and the corpus are terms which refer to the _____ (2 words) of angiosperms.
17. _____ (2 words) give rise to branches in stems.
18. In many dicot stems, the vascular bundle has a "cap" made of

_____ (type of cell).

19. Monocots have scattered vascular bundles. This type of stele is called a(n) _____.
20. The _____ attaches the leaf blade to the stem.
21. The mesophyll of a typical dicot leaf is composed of the loosely arranged cells of the spongy layer and the columnar, tightly packed layer called the _____ layer.
22. A _____ is flattened stem material modified for photosynthesis.
23. The _____ is a structure in woody stems which allows for gas exchange through the bark.
24. Secondary tissues of a plant are produced by _____.
25. IAA or indole-acetic acid are other names for the hormone called _____.
26. Which hormone stimulates the divisions of the vascular cambium to initiate growth in the spring in woody plants?
_____.
27. Which group of hormones was first discovered in coconut milk?
_____.
28. The _____ hormones were first discovered in a fungus which attacks rice plants.

29. A growth response in a plant to a unidirectional stimulus is called a _____.
30. The pigment which is involved in photoperiodism is called _____.
31. A _____ soil is a type of soil with intermediate concentrations of sand, silt and clay.
32. In the phloem, the carbohydrate _____ is the most commonly transported sugar molecule.
33. The pathway by which minerals move through the root to the stele is the _____ pathway.
34. Guttation is caused by _____ (2 words).
35. The spindle apparatus is composed of _____.
36. An enzyme is an organic _____ which means that it decreases the energy required for a reaction without being used up.
37. Biological cell membranes are composed primarily of proteins and molecules called _____.
38. The oxygen released by plants during the daytime comes from the breakdown of _____.
39. Changes in the sequences of bases in a DNA molecule or abnormalities in chromosomal structures are called _____.
40. The making of a protein molecule from the mRNA template is the process called _____.

41. Cells which lack organized nuclei are called _____ cells.
42. Truffles belong to the Division _____.
43. The term used to describe two different organisms living together (as in the lichens) is _____.

III. True or False (70 points).

- _____ 1. Monocots have flower parts in groups of 4's and 5's.
- _____ 2. To be a perfect flower, the flower must have both male and female reproductive organs.
- _____ 3. Primitive flowers probably had many separate carpels, stamens, petals, and sepals.
- _____ 4. If a flower has an inferior ovary, it is said to be epigynous.
- _____ 5. A carpel can be composed of three fused pistils.
- _____ 6. A mature angiosperm pollen grain is actually the male gametophyte generation.
- _____ 7. Double fertilization occurs in the Division Anthophyta.
- _____ 8. Collenchyma cells are only found in the root.
- _____ 9. Vessels and tracheids are dead when they are mature.
- _____ 10. Companion cells lack nuclei.
- _____ 11. Root hairs are multicellular.
- _____ 12. The Casparian strip is a suberized layer on cells of the pericycle.
- _____ 13. Monocots are more likely to have "fibrous" root systems than dicots.
- _____ 14. A sweet potato is a storage root.
- _____ 15. Metaxylem elements mature later than protoxylem cells.
- _____ 16. Leaflets have axillary buds associated with them.

- ___ 17. Sun leaves are usually thinner and larger than shade leaves.
- ___ 18. Tendrils can be modified leaves or branches.
- ___ 19. Sclerenchyma cells have secondary cell walls made of lignin.
- ___ 20. The “bark” of a woody plant includes the secondary phloem.
- ___ 21. The actively water-conducting “wood” of dicots is termed the heartwood.
- ___ 22. The phelloderm is derived from divisions of the vascular cambium.
- ___ 23. Ethylene is the hormone most frequently associated with fruit ripening.
- ___ 24. Cytokinins can keep cut leaves of certain plants from aging (turning yellow).
- ___ 25. IAA is produced by grass embryos and moves to the aleurone layer where it stimulates amylase enzyme formation.
- ___ 26. Gibberellic acid can overcome genetic dwarfing in certain plants.
- ___ 27. ABA can cause guard cells to close.
- ___ 28. 2,4-D and 2,4,5-T are synthetic auxins found in Agent Orange.
- ___ 29. Development of the fruit without fertilization is called carpogenesis.
- ___ 30. It is the root cap in roots which detects gravity.
- ___ 31. Phototropic responses in plants can be caused by red light.
- ___ 32. All angiosperms are either short-day plants or long-day plants.
- ___ 33. Etiolation is a red/far-red response in plants.
- ___ 34. Magnesium is needed for chlorophyll synthesis.
- ___ 35. Copper and zinc function as structural components of proteins in many plants.
- ___ 36. P_{660} and P_{730} refer to the wavelengths of light used by carotenoids in photosynthesis.
- ___ 37. Plants bend toward the light from a window because the auxin molecules migrate to the illuminated side.

- _____ 38. The hygroscopic water in soils is unavailable to plants.
- _____ 39. Loss of liquid water from a plant through hydathodes is called guttation.
- _____ 40. If potassium ions are pumped into the guard cells, they will open.
- _____ 41. The Calvin Cycle of photosynthesis take place in the grana of the chloroplast.
- _____ 42. Flagella and cilia have the same basic (9+2) ultrastructure.
- _____ 43. The DNA of the nucleus is duplicated during the G₂ phase of the cell cycle.
- _____ 44. The tertiary structure of a protein is the actual sequence of the amino acids held together by the peptide bonds.
- _____ 45. The Krebs's cycle takes place in the mitochondrion.
- _____ 46. Alcoholic fermentation is less energy efficient than aerobic respiration.
- _____ 47. Cytochrome molecules contain iron.
- _____ 48. C₄ plants are generally more efficient photosynthesizers than C₃ organisms.
- _____ 49. Synapsis and crossing over occur in mitosis and meiosis.
- _____ 50. Mycorrhizae are important to many plants because they assist in mineral uptake.
- _____ 51. Mushrooms are basidiomycete fungi.
- _____ 52. Red algae cause red tides.
- _____ 53. Diatoms have cell walls called frustules or valves.
- _____ 54. Kelps have a heteromorphic alternation of generations type of life cycle.
- _____ 55. Oomycetes are diploid protists with gametic meiosis (diploid life cycles).
- _____ 56. Yeasts belong to the Division Ascomycota.
- _____ 58. Plasmodial slime molds such as *Stemonitis* are members of the Kingdom Fungi.
- _____ 59. Agar and alginic acid are both products of the brown algae.
- _____ 60. *Acetabularia* and *Micrasterias* are algal genera in the Chlorophyta.

- _____ 61. Gemmae cups function in asexual reproduction of the liverwort sporophyte.
- _____ 62. Chlorophyllose and hyaline cells are found in the leaves of *Sphagnum*.
- _____ 63. Members of the Division Lycophyta have microphyllous leaves.
- _____ 64. The indusium is a structure found protecting the sporophyte of mosses and liverworts.
- _____ 65. All ferns are homosporous.
- _____ 66. In a pine, the embryo is nourished by the cells of the female gametophyte.
- _____ 67. Mormon Tea (*Ephedra*) is a member of the Gnetophyta.
- _____ 68. The heterocyst cells of cyanobacteria can fix atmospheric nitrogen.
- _____ 69. All conifers are evergreens.
- _____ 70. Darwin explained “why” genetic traits were passed from generation to generation, while Mendel tried to explain “how” these traits were inherited.

IV. Matching (20 points).

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| _____ gynoecium | A. loss of water vapor from a plant |
| _____ potassium | B. fossil member of the Lycopphyta |
| _____ stone cells | C. outer wall layer of the pollen grain |
| _____ exine | D. an insect used in phloem research |
| _____ transpiration | E. assists in spore dispersal in mosses |
| _____ aphid | F. a plant macronutrient |
| _____ heterothallic | G. food reserve of <i>Euglena</i> |
| _____ buliform cells | H. all female parts of the flower |
| _____ paramylon | I. assist with spore dispersal in liverworts |
| _____ elaters | J. sclerenchyma cells used for support in angiosperms |
| _____ fibers | K. discovered the structure of DNA |
| _____ Fritz Went | L. explanation of phloem transport |
| _____ sorus | M. specialized cells found in the upper epidermis of grasses. |
| _____ sporangiophore | N. a horizontal, underground stem |
| _____ rhizome | O. a type of sclereid found in pears |
| _____ <i>Lepidodendron</i> | P. a cluster of sporangia in ferns |
| _____ Garner & Allard | Q. unit of construction of an <i>Equisetum</i> strobilus |
| _____ pressure flow | R. Dutch physiologist who named the hormone auxin from coleoptiles. |
| _____ <i>Rhynia</i> | S. earliest known vascular plant |
| _____ peristome | T. requires two compatible mating types |
| | U. correct answer not given |

V. Diagrams to label (15 points).

VI. Matching (20 points).

_____ codons

_____ ribose

_____ amino acids

_____ suberin

_____ cutin

_____ chitin

_____ cellulose

_____ nucleotides

_____ fatty acids

_____ anticodons

A. waxy lipid on leaf surfaces

B. found on cells of the bark

C. cell wall component of fungi

D. a polymer of glucose

E. saturated or unsaturated types

F. building blocks of DNA and RNA

G. 3 base codes on mRNA molecules

H. a simple 5 carbon sugar

I. building blocks of proteins

J. 3 base codes on tRNA molecules

VII. Genetics Problem (10 points).

