

Name: \_\_\_\_\_

**Organismal Biology Exam 1**  
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1. When stomata open during the day, on a per mole basis, ....
  - A. more CO<sub>2</sub> moves into the plant than the amount of H<sub>2</sub>O that moves out of the plant.
  - B. the amount of CO<sub>2</sub> entering and H<sub>2</sub>O leaving through the stomata are the same.
  - C. more H<sub>2</sub>O moves out of the leaf than the amount of CO<sub>2</sub> entering the leaf.
  - D. more water moves into the plant than the amount of CO<sub>2</sub> that leaves the plant.
  
2. At the point when the two guard cells will fill with water and cause the pore to open, which of the following molecules or ions should not be present at a high concentration in the guard cells?
  - A. malate
  - B. K<sup>+</sup>
  - C. Cl<sup>-</sup>
  - D. malic acid
  
3. It is thought that stomata close because the guard cells exhibit a decline in \_\_\_\_\_ at the end of the day.
  - A. Cl<sup>-</sup>
  - B. sucrose
  - C. starch
  - D. H<sup>+</sup>
  
4. Which of the following cells will not be respiring?
  - A. leaf phloem cells
  - B. leaf xylem parenchyma cells
  - C. leaf mature xylem vessels
  - D. leaf epidermal cells
  
5. The release of liquid water by leaves when the soil moisture is high is known as:
  - A. vaporization.
  - B. photosynthesis.
  - C. guttation.
  - D. transpiration.
  - E. abscission.

6. The expected relationship between leaf stomatal density and soil moisture in any given area on earth is best depicted by one of the following figures. Which figure is it?

A.

B.

C.

D.

7. How would you describe the morphology of the following leaf arrangement, venation and shape?

- A. alternate, pinnately netted, pinnately compound
- B. alternate, palmately netted, simple
- C. opposite, pinnately netted, simple
- D. opposite, pinnately netted, palmately compound

8. Modified leaves that enable a stem to climb are called \_\_\_\_\_ whereas modified leaves that cover the winter buds of a dormant woody plant are called \_\_\_\_\_ .

- A. spines; bud scales
- B. bud scales; tendrils
- C. tendrils; bud scales
- D. tendrils, spines

9. The area where the petiole detaches from the stem is referred to as the:

- A. abscission zone.
- B. middle lamella.
- C. bundle sheath extension.
- D. terminal bud.

10. In the accompanying figure, the palisade mesophyll is labeled:

- A. 1
- B. 2
- C. 3
- D. 6

11. The structure labeled \_\_\_\_\_ is responsible for the transport of dissolved sugars.

- A. 4
- B. 5
- C. 7
- D. 9

Use this accompanying figure to answer questions 10 and 11.

12. A plant that requires two years to complete its life cycle is referred to as:

- A. a biennial.
- B. an annual.
- C. a perennial.
- D. a dicot.

13. The most abundant polymer in the world is:

- A. cellulose
- B. glucose
- C. hemicellulose
- D. lignin

14. The cell type in the accompanying figure is:

- A. a sclereid.
- B. a companion cell.
- C. A collenchyma cell.
- D. A parenchyma cell.

15. One function of the cell type in the accompanying figure is:

- A. reducing water loss.
- B. support.
- C. conduction of water.
- D. photosynthesis.

Use this accompanying figure to answer questions 14 and 15.

16. What two tissues transport materials throughout the entire plant body?

- A. phloem and xylem
- B. sclerenchyma and xylem
- C. parenchyma and xylem
- D. sclerenchyma and collenchyma

17. Xylem is composed of all the following cell types except:

- A. tracheids.
- B. vessel elements.
- C. fibers.
- D. sieve tube elements.

18. The extremely flexible tissue that provides support in soft, nonwoody plants, allowing them to grow upward is:

- A. parenchyma tissue
- B. collenchyma tissue
- C. dermal tissue
- D. meristematic tissue

19. Primary growth describes the increase in the length of a plant and occurs at the:

- A. cork cambium.
- B. apical meristem.
- C. vascular cambium.
- D. periderm.

20. Parenchyma, collenchyma and sclerenchyma are classified as:

- A. dermal tissues
- B. ground tissues
- C. vascular tissues
- D. secondary tissues

21. The structures labeled by 4 in the figure:

- A. are the cotyledons.
- B. Indicate that this plants is a dicot.
- C. are part of the embryo.
- D. All of the above

Use this figure to answer question 21.

22. Fruits that develop from a flower with many separate ovaries are referred to as:

- A. accessory fruits
- B. aggregate fruits
- C. dry fruits
- D. multiple fruits

23. Flowers that are strong-smelling and are blue or UV purple in color would most likely be pollinated by:

- A. insects.
- B. birds.
- C. bats.
- D. wind.

24. The fusion of the a sperm cell with two polar nuclei in the ovule forms the:

- A. cotyledon.
- B. endosperm.
- C. fertilized egg.
- D. zygote.

25. The female plant structure on which a pollen grain will and is the:

- A. style
- B. pistil
- C. stigma
- D. anther

26,27 Use the accompanying figure to answer the following questions.

26. On the accompanying figure, the structure in which the formation of eggs would occur is labeled \_\_\_\_\_

- A. 1
- B. 5
- C. 6
- D. 9

27. The structure in which you would find microsporocytes is labeled \_\_\_\_\_ in the accompanying figure.

- A. 1
- B. 2
- C. 6
- D. 9

28. Which statement about the megasporocyte is true?

- A. It undergoes meiosis to produce three haploid cells.
- B. It is a diploid cell located within an ovule.
- C. It divides mitotically to form a male gametophyte.
- D. It plays an important role in cross-pollination.

29. Following double fertilization, the ovule develops into \_\_\_\_\_, and the ovary develops into \_\_\_\_\_.

- A. a cotyledon; an embryo
- B. an embryo; a seed
- C. a seed; a fruit
- D. a fruit; a seed

28. Which is the correct sequence of embryonic development in dicots?

- A. globular embryo → suspensor embryo → proembryo → heart stage embryo
- B. proembryo → globular embryo → heart stage embryo → torpedo stage embryo
- C. proembryo → torpedo stage embryo → heart stage embryo → globular embryo
- D. heart stage embryo → globular embryo → proembryo → torpedo stage

29. Rhizomes, tubers, corms and stolons are examples of modified:

- A. leaves.
- B. Flowers.
- C. Roots.
- D. Stems.

31. The largest cones produced on a pine tree, the ones we typically most familiar with, are the female cones that contain:

- A. megasporangia
- B. microsporangia
- C. pollen
- D. microspores

32. Pine pollen is primarily disseminated by:

- A. Birds.
- B. wind.
- C. water.
- D. Beetles.

33. After pollination, it takes approximately \_\_\_\_\_ months for fertilization to occur in pines.

- A. 10
- B. 2
- C. 15
- D. 24

34. The most diverse, successful, and familiar group of plants today are the:

- A. gymnosperms.
- B. bryophytes.
- C. ferns.
- D. angiosperms.

35. Seeds are reproductively superior to spores because:

- A. seeds contain a multicellular young plant.
- B. Only seeds can survive for an extended period of time.
- C. Seeds are protected by a multicellular seed coat.
- D. A and C.

36. Both gymnosperms and angiosperms:

- A. are heterosporous.
- B. lack a free-living gametophyte stage.
- C. possess vascular tissues.
- D. All of the above.

37. Motile sperm cells are found as vestiges in these two gymnosperm groups:

- A. monocots, dicots
- B. gnetophytes, conifers
- C. cycads, ginkgophytes
- D. cycads, conifers

38. In gymnosperms, the tissue that nourishes the embryo is:

- A. diploid
- B. haploid
- C. triploid
- D. nopoloid

39. In gymnosperms and flowering plants, the multicellular male gametophyte is called:

- A. the nucellus
- B. embryo sac
- C. pollen grain
- D. generative cell

40. In flowering plants, the multicellular female gametophyte is called:

- A. the pollen grain
- B. embryo sac
- C. endosperm
- D. generative cell

41. The \_\_\_\_\_ is the male sexual structure that produces sperm in mosses and ferns.

- A. antheridium
- B. archegonium
- C. stoma
- D. sporangium

42. Plants are thought to have evolved from a group of algae known as:

- A. red algae
- B. charophytes
- C. dinoflagellates
- D. cyanobacteria

Use the figure to answer questions 43, 44

43. The life cycle in the accompanying figure could be representative of all the following except:

- A. ferns.
- B. club mosses.
- C. Horsetails.
- D. None of the above, the life cycle should apply to all.

44. The transition from the gametophyte into the sporophyte generation occurs at the point in the figure labeled:

- A. 1.
- B. 4.
- C. 6.
- D. 8.

45. Which of the following is a vascular plant?

- A. moss
- B. fern
- C. liverwort
- D. hornwort

46. Alternation of generations in plants refers to the alternation of:

- A. diploid and haploid stages.
- B. male and female stages.
- C. spore and seed stages.
- D. thallus and leaf stages.

47. Primary cell walls of plants contain:

- A. cellulose, hemicellulose, lignin
- B. cellulose, hemicellulose, starch
- C. cellulose, hemicellulose, pectin
- D. lignin, cellulose

48. The \_\_\_\_\_ generation is dominant in mosses, as it can live independently.

- A. haploid sporophyte
- B. haploid gametophyte
- C. diploid sporophyte
- D. diploid gametophyte

49. The gametophyte generation of the fern is called the:

- A. prothallus
- B. protonema
- C. thallus
- D. fiddlehead.

50. Most seedless plants produce spores of one morphological type, which is referred to as:

- A. heterospory.
- B. sporogeny.
- C. homosporous.
- D. microspory.