

AP Biology--Chapters 34-39 Review

1. You are studying tropical plants in a Costa Rican cloud forest. You have identified a plant that has not been studied before. It has compound leaves with netted veins, vascular bundles arranged in a cylinder, and five petals on its very large and showy flower. This plant is most likely a
 - A) monocot.
 - B) eudicot.
 - C) gymnosperm.
 - D) None of the above
2. The plant described in Question 1 grows to approximately 40 m at maturity and is in a forest ecosystem. This plant most likely has which of the following root types?
 - A) Fibrous
 - B) Taproot
 - C) Adventitious
 - D) Rhizoids
3. You planted sweet peas along your back garden fence. You note that they are very effective at climbing the fence. Upon closer inspection, you notice that the plants are attached to the fence by tendrils. These tendrils are modifications of
 - A) stems.
 - B) roots.
 - C) branches.
 - D) leaves.
4. Plant cells are easily distinguished from animal cells because they have
 - A) rigid cell walls.
 - B) plastids.
 - C) large vacuoles.
 - D) All of the above
5. Plant cells that are photosynthetically active are found in the _____ layer of the leaf and are _____ cells.
 - A) mesophyll; parenchyma
 - B) epidermis; parenchyma
 - C) mesophyll; sclerenchyma
 - D) epidermis; sclerenchyma

6. Water is conducted in _____ tissue, and carbohydrates and nutrients are transported in _____ tissue.
- A) xylem; phloem
 - B) phloem; xylem
 - C) parenchyma; phloem
 - D) parenchyma; xylem
7. Plants are capable of indeterminate growth because of
- A) meristem tissues.
 - B) regions of continually dividing cells.
 - C) their modular nature.
 - D) All of the above
8. Which of the following best describes the origin of wood?
- A) Xylem cells enlarge and deposit large amounts of lignin.
 - B) Primary meristems increase the amount of xylem deposited.
 - C) Lateral meristems contribute to continuous increases in vascular tissue.
 - D) None of the above
9. Which of the following statements concerning wood is true?
- A) All woody plants show annual growth rings.
 - B) Patterns of both cylindrical secondary growth and lateral vascular rays are visible in wood.
 - C) Sapwood and hardwood result from patterns in primary xylem.
 - D) All of the above
10. Which of the following best describes the function of the cork cambium?
- A) It lays down a protective cork covering over exposed phloem tissue.
 - B) It inhibits the sloughing of epidermal tissue.
 - C) It allows for diameter shrinking in stems and roots.
 - D) All of the above
11. Sieve tube members have sieve plates where they join other sieve tube members. Which of the following best describes the sieve plates?
- A) Sieve plate pores are enlargements of meristems.
 - B) Sieve plates are necessary to allow conduction between sieve tube cells.
 - C) Sieve plates allow joining of cytoplasm between adjacent stomata.
 - D) All of the above

12. Plants regulate gas exchange and water loss via
- A) the cuticle.
 - B) guarded stomata.
 - C) coated pits.
 - D) sieve plates.
13. The protoderm becomes what type of tissue system?
- A) Dermal tissue system
 - B) Ground tissue system
 - C) Vascular tissue system
 - D) All of the above
14. Primary growth occurs at the
- A) lateral meristems.
 - B) fruit.
 - C) quiescent center.
 - D) apical meristems.
15. Vascular bundles are composed of _____ and _____.
- A) root hairs; xylem
 - B) cork; phloem
 - C) xylem; phloem
 - D) wood; cork
16. The function of the Casparian strips is to
- A) divert water and minerals through the membranes of endodermal cells.
 - B) prevent water and minerals from entering the stele through the apoplast.
 - C) provide regulation for water and mineral movement in the plant.
 - D) All of the above
17. The primary difference between the apoplast and the symplast is that the
- A) apoplast consists of nonliving spaces and cell walls.
 - B) apoplast relies on active transport.
 - C) symplast consists of nonliving spaces and cell walls.
 - D) apoplast prevents passive diffusion.
- Answer : a

18. Which of the following regarding water transport is true?
- A) Root pressure is sufficient to drive xylem sap movement.
 - B) Bulk flow is not a mechanism by which water and minerals are transported.
 - C) The cohesive nature of water is central to water movement in a plant.
 - D) None of the above
19. Tension is a result of which of the following?
- A) Transpiration at the leaf surface
 - B) The cohesive nature of water
 - C) The narrowness of the xylem tube
 - D) All of the above
20. The fact that water transport continues as long as leaves are alive and active indicates that
- A) leaves pump water.
 - B) leaves are necessary for transport of water.
 - C) roots are active.
 - D) water is not needed for leaves to remain alive.
21. Which of the following is true regarding transport in phloem?
- A) Transport in phloem is always in the direction of leaves to roots.
 - B) Transport in phloem is from source tissue to sink tissue.
 - C) Transport in phloem cells requires no energy inputs from the plant.
 - D) None of the above
22. If the pressure potential is 0.16 megapascals (MPa) and the solute potential is -0.24 MPa, then the water potential would be
- A) 0.04 MPa.
 - B) 0.08 MPa.
 - C) -0.08 MPa.
 - D) -0.24 MPa.
23. If you were to order the water potential of the following root cells or regions from least to most negative, which cell or region would be third?
- A) Xylem
 - B) Soil next to root
 - C) Cortex apoplast
 - D) Stele apoplast

24. The movement of water up the stems of tall plants is least dependent on which of the following factors?
- A) Guttation
 - B) Transpiration
 - C) Cohesion of water molecules
 - D) Tension within water columns
25. Which of the following is true of both xylem transport and phloem transport?
- A) Both are passive processes that do not require energy from the plant.
 - B) Both involve only living cells.
 - C) Both rely on a water potential gradient.
 - D) The direction of flow can reverse in both.
26. Which of the following regulates stomatal opening and closing?
- A) Abscisic acid levels
 - B) Light levels
 - C) Carbon dioxide concentrations
 - D) All of the above
27. The opening and closing of the stomata are accomplished by the
- A) sieve tube.
 - B) guard cells
 - C) translocation.
 - D) aquaporins.
28. Regulators of stomatal opening and closing work by activating the
- A) proton pump in guard cells.
 - B) proton pump in stomata.
 - C) sodium–potassium pump.
 - D) All of the above
29. Mineral ions enter the cell due to the force of an electrochemical gradient set up by pumping _____ out of the cells.
- A) K^+
 - B) Ca^{2+}
 - C) Na^+
 - D) H^+

30. In the pressure flow model describing translocation, the movement of water by osmosis occurs from the
- A) xylem to the phloem at the sink.
 - B) phloem to the xylem at the source.
 - C) xylem to the phloem at the source.
 - D) All of the above
31. Which of the following nutrients is *not* considered essential for plant growth?
- A) Cadmium
 - B) Nitrogen
 - C) Manganese
 - D) Potassium
32. Macronutrients are _____ than micronutrients.
- A) larger molecules
 - B) needed in greater quantities
 - C) more essential
 - D) more important for growth
33. Nitrogen and potassium are acquired from
- A) soil solution.
 - B) heterotrophs.
 - C) air.
 - D) All of the above
34. You notice that the young leaves of your tomato plants are very yellow, whereas the older leaves are still green. What type of deficiency does this suggest?
- A) Nitrogen
 - B) Carbon
 - C) Water
 - D) Iron
35. Years of cotton farming in the South has stripped away much of the A horizon of the soils. Subsequent agriculture has been difficult for farmers because the
- A) A horizon contains the most available nutrients.
 - B) B horizon contains significantly more available nutrients.
 - C) C horizon is most conducive to root growth.
 - D) All of the above

36. Clay particles in soils are important for
- A) holding soil together.
 - B) ion exchange.
 - C) holding water.
 - D) All of the above
37. Most clays form from the _____ of rock.
- A) mechanical weathering
 - B) chemical weathering
 - C) heaving
 - D) All of the above
38. You purchase a commercial fertilizer at your local garden center. The label says that it is 10-20-10. This label refers to the
- A) percentages of nitrogen, phosphate, and potassium.
 - B) percentages of nitrogen, carbon, and oxygen.
 - C) rate at which nitrogen is released from the fertilizer.
 - D) ratio of organic to inorganic matter in the fertilizer.
39. The relationship between *Rhizobium* and the roots of legumes can best be described by which of the following terms?
- A) Parasitic
 - B) One-sided
 - C) Mutualistic
 - D) Carnivorous
40. Nitrogen gas is reduced to ammonia by which of the following enzymes?
- A) *Rhizobium*
 - B) Nitrogenase
 - C) Nitrification
 - D) Denitrification
41. Plants are able to take up and use nitrogen in the form of _____ and _____.
- A) ammonia; nitrate
 - B) ammonia; nitrogen gas
 - C) nitrogen gas; nitrate
 - D) All of the above

42. Carnivorous plants are often found in acidic and nutrient-poor environments. The main selective pressure for carnivory is
- A) lack of nitrogen and phosphorous sources.
 - B) lack of iron and calcium sources.
 - C) incomplete ion exchange.
 - D) All of the above
43. Why do nitrate and sulfate leach from the soil?
- A) Because they bind with ions such as K^+ and Mg^{2+} .
 - B) The H^+ ions released by the roots push them out.
 - C) Because they are unable to bind with the negatively charged clay particles.
 - D) All of the above
44. What process is used to lower the pH of soil?
- A) Ion exchange.
 - B) Leaching.
 - C) 5-10-10 fertilizing.
 - D) Liming.
45. Plant growth is ultimately regulated by which of the following?
- A) Environmental cues
 - B) Hormones
 - C) Signal transduction pathways
 - D) A plant's genome
46. Which of the following schemes best represents how environmental cues are transduced to changes in a plant?
- A) Receptors receive environmental cues, a signal transduction pathway is initiated, there is an alteration in the particular genes that are transcribed and translated, and a cellular response is generated.
 - B) Receptors are triggered, hormones are released, signal transduction pathways are initiated, there is an alteration in expression of genes, and a cellular response is generated.
 - C) None of the above
 - D) Both a and b
47. Which of the following triggers germination of a seed?
- A) It imbibes water.
 - B) It is released from fruit.
 - C) It undergoes chemical changes.
 - D) All of the above

48. Which of the following may function to break dormancy in seeds?
- A) Penetration of the seed coat
 - B) Leaching of inhibitory compounds by water
 - C) Exposure to fire
 - D) All of the above
49. Which of the following hormones is responsible for bud break in the spring in deciduous trees?
- A) Auxins
 - B) Cytokinins
 - C) Gibberellins
 - D) Ethylene
50. Auxin regulates cell growth by which of the following mechanisms?
- A) Altering the elasticity of cell walls
 - B) Altering the plasticity of cell walls
 - C) Synthesizing new cell walls
 - D) Breaking down cell walls in growing cells
51. Which of the following hormones is responsible for maintaining bud dormancy in deciduous trees?
- A) Auxins
 - B) Cytokinins
 - C) Gibberellins
 - D) Abscisic acid
52. You have installed an outdoor gas-burning grill on your back patio next to your favorite camellia bush. After the first few chilly nights of using your grill, you notice that your camellia, which does not normally lose its leaves, is beginning to do so. Which of the following is the best explanation for what is happening?
- A) The bush is getting too warm next to your grill.
 - B) Ethylene is a by-product of the gas you are burning and is causing senescence in your plant.
 - C) Abscisic acid is a by-product of the gas you are burning and is causing senescence in your plant.
 - D) The plant is a biennial and is bolting.

53. You are slicing a green pepper for a pizza you are making at home. As you slice into it, you notice lots of tiny pepper plants emerging from the seeds of the pepper. This pepper is exhibiting _____ and may be lacking in _____.
- A) parthenocarpy; gibberellins
 - B) parthenocarpy; abscisic acid
 - C) vivipary; gibberellins
 - D) vivipary; abscisic acid
54. Which of the following light receptors is responsible for absorbing blue and ultraviolet light?
- A) Phytochrome P_r
 - B) Phytochrome P_{fr}
 - C) Cryptochrome
 - D) Phototropin
55. Etiolated seedlings are produced by germinating seeds and kept in total darkness. Under which of the following conditions will plants kept in the dark begin to synthesize chlorophyll?
- A) After being given a pulse of blue light
 - B) After being given a pulse of red light
 - C) After being given a pulse of red light followed by a pulse of far-red light
 - D) After being given a pulse of far-red light followed by a pulse of red light
56. Ethylene is produced by what part of a plant?
- A) The seedling
 - B) The leaves
 - C) The fruit
 - D) All of the above
57. Auxin transport within a plant is said to be _____ and dependent on the action of _____ pumps.
- A) polar; proton
 - B) nonpolar; potassium
 - C) polar; potassium
 - D) bidirectional; proton
58. Auxin initiates all the following *except*
- A) stimulation of root initiation.
 - B) inhibition of leaf abscission.
 - C) stimulation of leaf abscission.
 - D) maintenance of apical dominance.

59. Red light activates the phytochrome into the P_{fr} state, which leads to which of the following events?
- A) Inhibition of chlorophyll
 - B) Leaf expansion
 - C) Hook folding
 - D) None of the above
60. You manage a greenhouse that produces roses for Valentine's Day. Roses normally bloom in June. Which of the following will most likely be the best lighting schedule for your roses?
- A) 16 hours of light, 8 hours of interrupted dark
 - B) 16 hours of light, 8 hours of uninterrupted dark
 - C) 10 hours of light, 14 hours of dark
 - D) None of the above
61. After setting the correct photoperiod, you still don't have roses. Which of the following has most likely contributed to the problem?
- A) The heating system is allowing fluctuations in temperature between 20°C and 25°C.
 - B) The furnace mechanic accidentally turned off the lights for an hour two days in a row.
 - C) The cleaning crew turned the lights on for an hour three nights in a row.
 - D) None of the above
62. You have moved into a new house. During the first summer you notice lots of plants that do not bloom. During the second summer your yard is a sea of blooms. It is now spring of the third year, and there are no plants. This can best be explained by which of the following?
- A) Your plants are annuals.
 - B) Your plants are biennials.
 - C) Your plants are perennials.
 - D) Your plants are being affected by drought.
63. Your mother gives you a houseplant. You notice it sending out long stems with what look like "little plants" attached. You allow one of these to rest in a cup of water and note that roots form. This is an example of
- A) asexual reproduction.
 - B) apomixis.
 - C) heterospory.
 - D) parthenogenesis.

64. If plants produce pollen and mature eggs at the same time, how are self-pollination and fertilization prevented?
- A) Some plants have self-incompatibility genes.
 - B) Some plants rely on physical barriers.
 - C) Both a and b
 - D) None of the above
65. Most wine grape vines are grafted onto rootstock of another species. How does this help grape yields?
- A) A hardy rootstock can replace a weak rootstock.
 - B) A high-producing vine stock can replace a low-producing vine stock.
 - C) It allows vintners to select for pest resistance without losing grape quality.
 - D) All of the above
66. The induction of flowering by means of exposure to low temperature is called
- A) vernalization.
 - B) frigidation.
 - C) apomixis.
 - D) None of the above
67. The cyclic variation in an organism that corresponds to a set light–dark cycle is referred to as an organism's
- A) biorhythm.
 - B) circadian rhythm.
 - C) period.
 - D) photoperiod.
68. The production of seeds without fertilization is called
- A) apomixis.
 - B) parthenogenesis.
 - C) conception.
 - D) circadian rhythm.
69. In the transition from vegetative growth to floral growth the _____ must be transformed to the _____. This involves a shift from _____ growth to _____ growth.
- A) apical meristem; floral meristem; indeterminate; determinate
 - B) lateral meristem; floral meristem; indeterminate; determinate
 - C) apical meristem; floral meristem; determinate; indeterminate
 - D) apical cambium; floral cambium; determinate; indeterminate

70. Which of the following best describes the fate of the generative cell of the pollen grain?
- A) It coordinates growth of the pollen tube.
 - B) It divides by meiosis to produce two sperm nuclei.
 - C) It divides by mitosis to produce two sperm nuclei.
 - D) None of the above
71. Which of the following is *not* part of a megagametophyte?
- A) pollen grain
 - B) synergids
 - C) antipodal cells
 - D) All of the above
72. Double fertilization involves all of the following *except* a sperm cell fusing with
- A) an egg cell.
 - B) the two polar nuclei.
 - C) a pollen grain.
 - D) All of the above
73. The shoot apex and the root apex are found during what stage of embryo development?
- A) The heart stage embryo
 - B) The egg stage embryo
 - C) The inflorescence meristem stage embryo
 - D) The torpedo stage embryo

Answer Key

1. B
2. B
3. D
4. D
5. A
6. A
7. D
8. C
9. B
10. A
11. B
12. B
13. A
14. D
15. C
16. D
17. A
18. C
19. A
20. B
21. B
22. C
23. C
24. A
25. C
26. D
27. B
28. A
29. D
30. C
31. A
32. B
33. A
34. D
35. A
36. D
37. B
38. A
39. C
40. B
41. A
42. A
43. C

- 44. D
- 45. D
- 46. D
- 47. A
- 48. D
- 49. C
- 50. B
- 51. D
- 52. B
- 53. D
- 54. C
- 55. C
- 56. D
- 57. A
- 58. C
- 59. B
- 60. B
- 61. C
- 62. B
- 63. A
- 64. C
- 65. D
- 66. A
- 67. B
- 68. A
- 69. A
- 70. B
- 71. A
- 72. B
- 73. D