

MY SO PRACTICE TEST

DIVISION B - MIDDLE SCHOOL, GRADES 6-9

PRACTICE TEST

Instructions

- You have 20 minutes to complete this test.
- You may write your answers directly in the test.
- You may use any notes or resources you have created or collected.
- You may use a calculator and scratch paper if necessary.
- Good Luck!

Test Questions

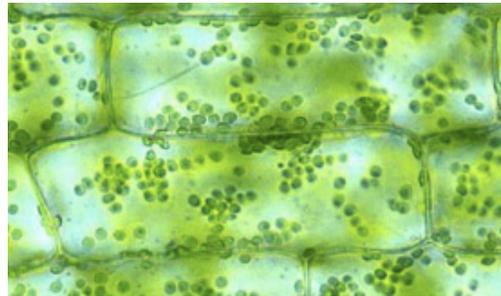
1. What is the innermost layer of the root cortex called?
 - a. Pith
 - b. Endodermis
 - c. Ectoderm
 - d. Core
2. Why does photosynthesis stop when leaves wilt?
 - a. Photolysis cannot occur when water is absent
 - b. Accumulation of oxygen in the leaves causes damage to the thylakoids
 - c. Chlorophyll is destroyed when there is a lack of water
 - d. CO₂ cannot enter the leaves when the stomata are closed
3. Which of the following is NOT an aggregate fruit?
 - a. Strawberry
 - b. Blackberry
 - c. Pineapple
 - d. Raspberry
4. A moth is most likely to pollinate a...
 - a. White flower with sweet fragrance
 - b. Small green flower with sweet fragrance
 - c. Red flower with fleshy odor
 - d. Bright red flower with little odor

5. Vascular plant tissue does NOT include which of the following cell types?
- Cambium cells
 - Sieve cells
 - Companion cells
 - Tracheids
6. Why is red algae often found deeper than other algae?
- The phycoerythrin pigment found in red algae allows it to photosynthesize using red light, which penetrates water deeper than short-wavelength light
 - The phycoerythrin pigment found in red algae allows it to photosynthesize using blue light, which penetrates water deeper than long-wavelength light
 - The chlorophyll b pigment found in red algae allows it to photosynthesize using red light, which penetrates water deeper than short-wavelength light
 - The chlorophyll b pigment found in red algae allows it to photosynthesize using blue light, which penetrates water deeper than long-wavelength light
7. Which of the following correctly describes the tendencies of plant roots and stems when responding to gravity?
- Roots: positively gravitropic; stems: negatively gravitropic
 - Roots: negatively gravitropic; stems: positively gravitropic
 - Both roots and stems are positively gravitropic
 - Both roots and stems are negatively gravitropic
8. Which of the following correctly describes the tendencies of plant roots and stems when responding to light?
- Roots: positively phototropic; stems: negatively phototropic
 - Roots: negatively phototropic; stems: positively phototropic
 - Both roots and stems are positively phototropic
 - Both roots and stems are negatively phototropic
9. Fill in the blanks: the xylem carries (1) _____ from the (2) _____ to (3) _____, while the phloem carries (4) _____ from the (5) _____ to (6) _____.
- (1) nutrients (2) leaves (3) roots (4) water (5) roots (6) leaves
 - (1) nutrients (2) roots (3) leaves (4) water (5) leaves (6) roots
 - (1) water (2) leaves (3) roots (4) nutrients (5) roots (6) leaves
 - (1) water (2) roots (3) leaves (4) nutrients (5) leaves (6) roots
10. Theodor Engelmann was a botanist who performed an experiment using a crystal prism to determine whether photosynthesis is dependent on the wavelength of light. He found that *Spirogyra* algae produced the most oxygen using the red and blue light. This led to the discovery that:
- Carotene is the key photosynthetic pigment because it reflects green light and accepts red and blue light
 - Carotene is the key photosynthetic pigment because it accepts green light and reflects red and blue light
 - Chlorophyll a is the key photosynthetic pigment because it reflects green light and accepts red and blue light
 - Chlorophyll a is the key photosynthetic pigment because it accepts green light and reflects red and blue light
11. Balance the following equation for photosynthesis:
- $$\text{___ CO}_2 + \text{___ H}_2\text{O} + \text{sunlight} \rightarrow \text{___ C}_6\text{H}_{12}\text{O}_6 + \text{___ O}_2$$
- 1, 6, 6, 1
 - 6, 6, 1, 6
 - 6, 12, 2, 12
 - 3, 1, 2, 6

12. Which of the following is not part of the land plant group?
- Mosses
 - Liverworts
 - Hornworts
 - Green algae
13. The once popular multiplayer game Agar.io is named after a substance named agar that is produced from...
- Red algae
 - Green algae
 - Blue algae
 - Brown algae
14. What does the presence of peptidoglycan in the chloroplast membranes of glaucophytes indicate?
- It supports the hypothesis that ancestral plant cells engulfed cyanobacteria, resulting in the formation of chloroplasts
 - It supports the hypothesis that chloroplasts evolved from mitochondria
 - It supports the hypothesis that chloroplasts originated from another structure in the plant cell through a step-by-step process
 - It supports the hypothesis that ancestral plant cells evolved from cyanobacteria, which already had chloroplasts
15. Which of the following is a correct relationship between chloroplasts and other members of the plastid family?
- All plastids except for chloroplasts have thylakoid membranes
 - Chloroplasts contain chlorophyll while chromoplasts lack chlorophyll but contain carotenoids
 - Chloroplasts only contain one green pigment while leucoplasts contain yellow, orange, and red pigments
 - Amyloplasts and elaioplasts are types of chloroplasts that store different types of chlorophyll
16. What is a synapomorphy that is shared by the clade containing lycophytes, ferns, and spermatophytes?
- They all use a vascular system to transport water against gravity
 - They all have megaphyll leaves
 - They all produce seeds
 - They all have a gametophyte-dominant life cycle
17. What is a key difference between gymnosperms and angiosperms?
- Gymnosperms are extremely diverse while there are only a few types of angiosperms
 - Gymnosperms have exposed seeds while angiosperms have enclosed seeds
 - Gymnosperms have flowers while angiosperms do not
 - Gymnosperm seeds are spread mostly by animals while angiosperms rely on wind
18. Which of the following is one of the male reproductive parts of a plant?
- Sepal
 - Stigma
 - Stamen
 - Style
 - All of the above

19. Which of the following is one of the female reproductive parts of a plant?
- Ovule
 - Ovary
 - Stigma
 - Style
 - All of the above
20. This biome has about 300-400 cm of precipitation annually, has high average annual temperatures from about 20-30 °C, and is dominated by phanerophytes. It includes many layers of plants including an emergent layer, an overstory, a sub-canopy, and a ground layer. What biome is this?
- Savanna
 - Temperate deciduous forest
 - Tropical forest
 - Grassland
21. Which process takes place in the chloroplast thylakoid?
- The light-dependent reactions of photosynthesis
 - The Calvin cycle stage of photosynthesis
 - The glycolysis stage of cellular respiration
 - The Krebs cycle stage of photosynthesis
22. Why are two sperm cells used in double fertilization in angiosperms?
- The second sperm cell helps guarantee that the egg cell is fertilized even if the first sperm cell fails
 - One sperm cell helps form the zygote, while the other forms the endosperm to provide nutrients to the embryo
 - The second sperm cell fertilizes the two polar nuclei to clear out space for the embryo to grow
 - Both sperm cells are needed to fertilize the egg cell to form a triploid zygote
23. Which of the following is true about ferns?
- Ferns are primarily found in tundra biomes
 - Ferns primarily have microphyll leaves
 - The spores of ferns are dispersed by water and the gametes are dispersed by air
 - The spores of ferns are located on the bottom of the leaves
24. Which of the following is FALSE about liverworts?
- Their life cycle is gametophyte-dominant
 - They contain stomata, which open and close
 - They are a non-vascular plant along with hornworts and mosses
 - They primarily grow in low, moist areas
25. What is the purpose of the Calvin cycle in photosynthesis?
- To use carbon dioxide and water to create 3-carbon sugars
 - To use the energy from sunlight to create ATP
 - To remove electrons from water and create oxygen
 - To send electrons in a cycle to repeatedly create ATP

26. Which of the following are examples of traits that GMO crops might have?
- Tolerance to herbicides
 - Resistance to diseases and viruses
 - Resistance to insects
 - All of the above
27. The peach plant (*Prunus perisa*) is an example of a(n)...
- Angiosperm
 - Seed plant
 - Vascular plant
 - All of the above
28. Carrots flower and produce seeds in the second year of their life cycle. How are they classified?
- Annual, herbaceous
 - Biennial, herbaceous
 - Perennial, herbaceous
 - Woody
29. What are the small green dots shown in this image?
- Mitochondria inside animal cells
 - Nuclei inside animal cells
 - Chloroplasts inside plant cells
 - Central vacuoles inside plant cells
30. Which historical botanist is best known for his study of genetics using pea plants?
- Gregor Mendel
 - Carolus Linnaeus
 - Charles Darwin
 - Jean-Baptiste Lamarck



ANSWER KEY

- | | | | | | |
|-----|----------|-----|----------|-----|----------|
| 1. | B | 15. | B | 29. | C |
| 2. | D | 16. | A | 30. | A |
| 3. | C | 17. | B | | |
| 4. | A | 18. | C | | |
| 5. | A | 19. | E | | |
| 6. | B | 20. | C | | |
| 7. | A | 21. | A | | |
| 8. | B | 22. | B | | |
| 9. | D | 23. | D | | |
| 10. | C | 24. | B | | |
| 11. | B | 25. | A | | |
| 12. | D | 26. | D | | |
| 13. | A | 27. | D | | |
| 14. | A | 28. | B | | |



Practice Test Developed with Science Olympiad at Cornell



Science Olympiad, Inc. (c) 2021