CHAPTER 10.1—10.3: Photosynthesis Reactions

1. What role do autotrophs fill in the biosphere?

_____

_____

2. Indicate the role of each structure within the leaf:

a. stomates _____

b. thylakoid membranes _____

c. stroma _____

3. What is the source of oxygen released from photosynthesis?

_____

_____

4. In the overview of photosynthesis, indicate the most significant function of:

a. Light reaction _____

b. Calvin cycle _____

5. Light is a form of energy known as _____ and visible light has a wavelength range of _____ .

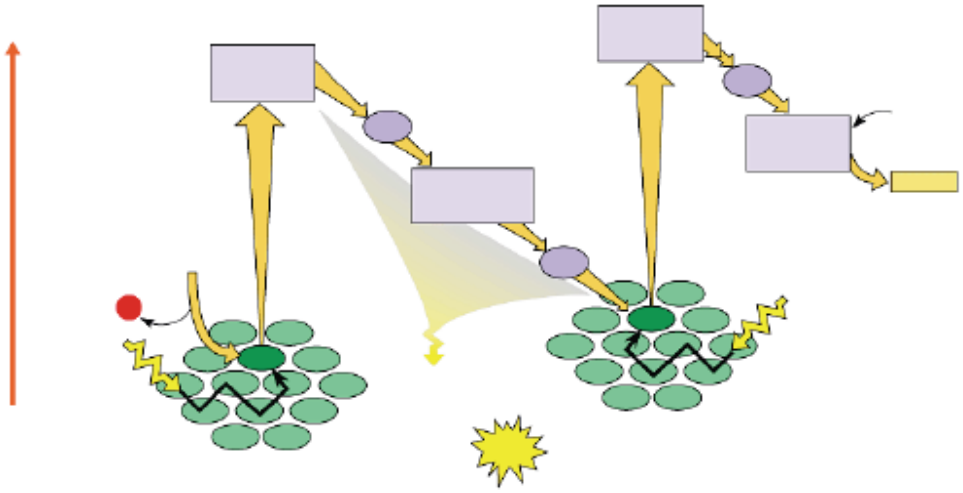
6. The porphyrin ring of chlorophyll contains the "metal" element _____

7. What does chlorophyll do when excited by photons? _____

_____

_____

8. Label the diagram and explain the difference between Photosystem I and Photosystem II. **(see Figure 10.8)**

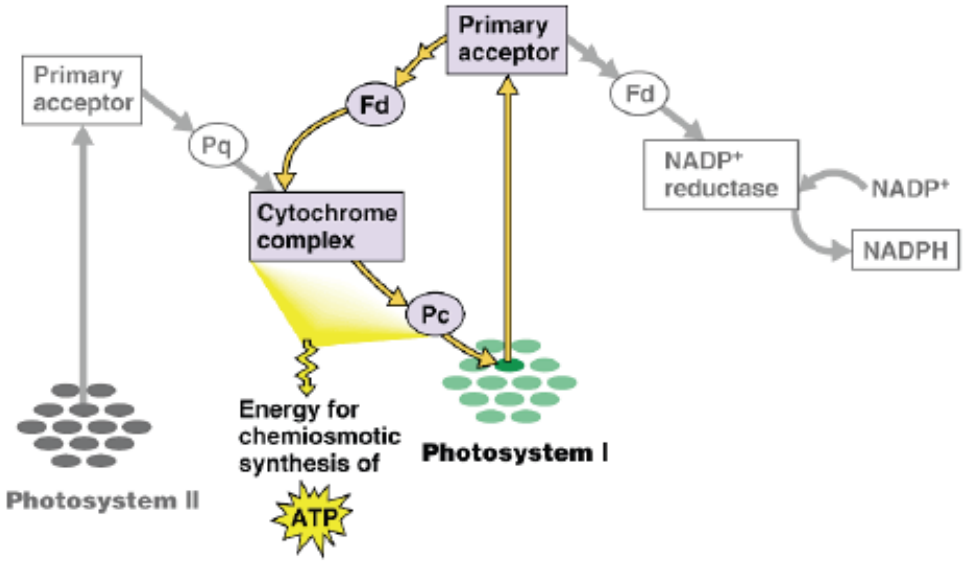


_____

_____

_____

9. With 2 different colored pencils, label the energy paths of both noncyclic and cyclic electron flow in the diagram.



10. How does cyclic differ from noncyclic photophosphorylation?

_____

_____

11. To generate ATP, chloroplasts rely on the ETC to _____

and ATP is synthesized when: _____

_____

12. Within the thylakoid membrane and stroma, indicate what happens to each of the following:

a. water _____

b. high energy electrons _____

c. H+ _____

d. oxygen _____

e. NADP+ _____

f. ADP _____

13. Where in the chloroplast is the H+ concentration highest? _____

_____

_____

14. What happens during carbon fixation?

_____

_____

15. List the materials the plant uses during the Calvin cycle and the source of the materials.

_____

_____

16. The products of the Calvin cycle are:

_____

_____

17. How did they determine the roles of oxygen gas and carbon dioxide in the Calvin Cycle?

_____

_____

_____

_____

18. What environmental and internal challenges have forced both C4 and CAM plants to evolve alternatives to the photosynthesis system used by other plants?

_____

_____

19. Why do high oxygen levels inhibit photosynthesis?

_____

_____

20. What happens during photorespiration and why is it considered bad for plants?

_____

_____