Chapter 35 Transport in Plants

1. Statement: Water and minerals are transported in a plant from the roots and up through the plant to the leaves in vessels called xylem.
2. Why doesn’t osmotic root pressure alone account for xylem transport?
3. Explain the transport of water up the xylem by explaining the transpiration-cohesion-tension mechanism.
4. What are stomata?
5. How does a plant balance its need to retain water with its need to obtain CO2 for photosynthesis?
6. Identify the function of guard cells. Describe the role of K+ in guard cells.
7. Explain why a plant might close its stomata during the daytime.
8. Discuss some factors that regulate the opening and closing of stomata.
9. Plants are able to move sugars through the phloem sap. Explain the pressure flow model and how this movement of sugary sap occurs.

Chapter 10 Photosynthesis

1. What is the literal translation of photosynthesis?
2. What is the chemical equation for photosynthesis?
3. Distinguish between the light (ATP/NADPH producing) reactions and the light-independent (Calvin cycle/carbon fixation) reactions.
4. What are the dual properties of light?
5. What three things can happen to light/photons when they meet a molecule?
6. What are pigments?
7. What is the difference between an absorption spectrum and an action spectrum?
8. Why are chlorophyll molecules so important for photosynthesis? (Be sure to include the terms light absorption, photosystem, reaction center, and electron donor in your answer.)
9. Statement: Do not worry about differentiating between noncyclic vs. cyclic electron transport. Just understand the electron transport chain depicted in Figure 10.12.
10. What is chemiosmosis? How is a proton (H+) gradient used by ATP synthase enzyme to create ATP?
11. Statement: Do not get lost in the details of the Calvin cycle. *(Memorization of the steps in the Calvin cycle, the structure of the molecules and the names of the enzymes involved are beyond the scope of the course and the AP exam.)*
12. Using Figure 10.15 as your guide, describe the role of ATP and NADPH in producing carbohydrates in the Calvin cycle.