Comprehension Questions - Module 7: Photosynthesis

Overview of Photosynthesis

1. Explain the overall equation for photosynthesis and identify the inputs and outputs.
2. Compare and contrast the light-dependent and light-independent reactions of photosynthesis.
3. How does photosynthesis convert light energy into chemical energy?

Chloroplast Structure

1. Describe the structure of chloroplasts and explain how their organization supports photosynthesis.
2. Explain the role of chlorophyll and other pigments in capturing light energy.
3. How does the structure of thylakoids maximize light capture and energy conversion?

Light-Dependent Reactions

1. Explain how photosystems capture and transfer light energy.
2. Describe the electron transport chain in photosynthesis and compare it to cellular respiration.
3. Explain how ATP and NADPH are produced during the light-dependent reactions.
4. What is photolysis, and why is it essential for photosynthesis?

Light-Independent Reactions (Calvin Cycle)

1. Describe the steps of the Calvin cycle and explain how carbon dioxide is fixed.

2. Explain how ATP and NADPH from the light-dependent reactions are used in the Calvin cycle.

3. How do plants regenerate the carbon dioxide acceptor molecule in the Calvin cycle?

Factors Affecting Photosynthesis

1. Explain how light intensity, carbon dioxide concentration, and temperature affect the rate of photosynthesis.

2. Compare and contrast C3, C4, and CAM photosynthesis pathways and their adaptations.