

1. Describe the major similarities between mitochondrial oxidative phosphorylation and photophosphorylation in the chloroplast? (10 points)

2. After very small viruses infect a plant cells by crossing its membrane, the viruses often spread rapidly throughout the entire plant without crossing additional membranes. Explain how this occurs. (10 points)

3. Gibberellins (GAs) could evoke a rapid initial cell growth response in a plant tissue. Provide a list of the sequence of events that proceed from the arrival of the hormone signal to the growth of the cell. (15 points)

4. How to isolate plant cell cycle-regulated genes? (15 points)

5. What are the advantages and disadvantages of using Arabidopsis T-DNA knock-out mutant for assaying genes and/or protein function? (15 points)

6. In a fertilizer analysis, what are the three critical nutrients (in order)? What are the roles of these three nutrients in plant growth and development? (15 points)

7. Fill-in the blanks (20 points)
 - A. The carboxylation reaction in a C3 plant is catalyzed by the enzyme ___(a)____. The carboxylation reaction in a bundle sheath cell of a C4 plant is catalyzed by the enzyme ___(b)_____.

 - B. Phytochrome exists in two form; the ___(c)____ form has an absorption maximum at 660 nm, while the ___(d) __ form has peak absorbance at 730 nm.