

1. What are the difference between xylem and phloem in structure and function? (15 points)
2. There are many ways to describe the water status of a plant, please name five of them. (10 points)
3. There are many ways to measure the degree of oxidative stress of a plant, please name five of them (10 points)
4. If you would like to identify the functions of an unknown protein, what you should do? (5 points)
5. How do plant uptake and transport iron from soil? (10 points)
6. Describe the difference between a macronutrient and a micronutrient? What was the reason for the inability of plant physiologists to identify micronutrients in early nutritional studies? Why is it difficult to supply iron in nutrient solutions and soils? What is the best way to overcome this difficulty? (10 points)
7. How can the operation of the plasma membrane  $H^+$ -ATPase affect (1) the uptake of  $K^+$  through membrane channels, and (2) the accumulation of sugars from the apoplast into the cell? (10 points)
8. Justify the following statement: The upland crops are severely damaged or died by 24 hours of flooding which resulted in water deficiency. (10 points)
9. If you saw a field of pear (梨), dark green in leaf color, serious flower drop (落花) or fruit drop (落果), and bursting of new shoots, you might suspect that what happen in these plants? Provide the reason(s). (10 points)
10. Explain the following terms: (10 points)
  - (1) glycophyte
  - (2) rhizosphere
  - (3) lodging of cereals
  - (4) ion channels
  - (5) *micorrhizae*