

1. Plant nutrients can be classified according to biochemical functions. Please give the nutrient elements that can be classified as a) esterification with native alcohol groups in plants; b) present predominantly in chelated form incorporated in prosthetic groups; c) assimilation by oxidation-reduction reactions. (12 points).
2. How does potassium play a driving force to solute flow in both xylem and phloem? (8 points)
3. In the process of plant development light plays not only a role in providing energy but also the trigger of some process of plant development, please name four of it. Which phytohormone is involved in this action? (15 points)
4. Total soil iron is always greatly in excess of crop requirements. Why does it come from the problems of iron shortage to crops? What strategies that could be have in plant to overcome this problem? (15 points)
5. Define the growth and development of plants. (5 points)
6. Define the determinate and indeterminate plants. (5 points)
7. Define the Halophytes and glycophytes. (5 points)
8. How to calculate the amount of nutrient absorbed through mass flow. (5 points)
9. There are three types of membrane transporters enhance the movement of solutes across membrane: channel, carriers, and pump. Define each transporter briefly. (5 points)
10. What is the meaning of electrogenic in plant nutrient uptake? Why are H^+ pumps electrogenic? (10 points)
11. List all the mineral nutrients that participate the photosynthetic reaction and the roles they play. (10 points)
12. What are the calcicoles and calcifuges? What are the probable reasons for the higher demand of calcium of dicotyledons than monocotyledons? (5 points)

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