

Part A (50 points)

1. Explanation of following terms in relation to plant nutrition (50 points)

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| (1) acid growth theory; | (14) iron efficiency ; |
| (2) apical dominance; | (15) leaf area index (LAI) |
| (3) apoplasm; | (16) long-distance transport; |
| (4) apparent free space; | (17) oxalate plants and potassium plants; |
| (5) brassinosteroids; | (18) proteoid roots; |
| (6) biological yield; | (19) phloem mobility; |
| (7) chlorosis; | (20) photooxidation |
| (8) calcicole and calcifuges; | (21) phytosiderophore |
| (9) critical deficiency concentration; | (22) remobilization |
| (10) cotransport; | (23) rhizosphere |
| (11) endomycorrhiza ; | (24) V-type ATPase |
| (12) facilitated diffusion in ion transport; | (25) water use efficiency |
| (13) foliar spray; | |

Part B (50 points)

1. Short answer questions

- (1) Describe the forms, the biochemical function to plants, and the types of fertilizers of nitrogen (N) nutrient. (10 points)
- (2) Describe mechanisms of iron utilization in monocot and non-monocot plants. (10 points)
- (3) Describe the biochemical function of sulfur(S) nutrient to plants, and explain why S is important for stress tolerance? (10 points)
- (4) (a) Describe the roles of calcium in plants; (b) Describe symptoms of calcium deficiency in plant leaves and fruits. (10 points)
- (5) Describe major differences between C3 and C4 plants. (10 points)

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