CHAPTER 12: MINERAL NUTRITION

ONE MARK QUESTIONS:

- 1. What is hydroponics?(K)
- 2. Who demonstrated the technique of hydroponics?(K)
- 3. What is a Micronutrient?(K)
- 4. What is a Macronutrient?(K)
- 5. What is critical concentration?(K)
- 6. What is meant by mineral deficiency symptom?(K)
- 7. What is Chlorosis?(K)
- 8. What is Necrosis?(K)
- 9. When do we consider mineral ion concentration as toxic? (K)
- 10. When do we call an element as deficient?(K)
- 11. Define-flux. (K)
- 12. Which is the path of mineral salts from root to aerial parts of the plants?(K)
- 13. Which is the reservoir of essential elements?(K)
- 14. How does soil get enriched with dissolved ions and inorganic salts?(K)
- 15. The role of minerals in plant nutrition is referred to as mineral nutrition. Why?(K)
- 16. What is meant by nitrogen fixation? (K)
- 17. What is ammonification?(K)
- 18. What is nitrification?(K)
- 19. Name two nitrifying bacteria.(K)
- 20. What is denitrification?(K)
- 21. Mention the name of a denitrifying bacteria. (K)
- 22. What is biological nitrogen fixation? (K)
- 23. Name the enzyme involved in the reduction of nitrogen in to ammonia.(K)
- 24. Give an example for leguminous symbiotic nitrogen fixing bacteria.(K)
- 25. Give an example for non leguminous symbiotic nitrogen fixing bacteria.(K)
- 26. Why the central part of a root nodule appears pink in colour?(K)
- 27. What is leg haemoglobin?(K)
- 28. What is an infection thread?(K)
- 29. Mention the enzyme involved in reductive amination.(K)
- 30. Mention the enzyme involved in trans amination.(K)
- 31. Name the amino acid that transfers its amino group to other keto acids during transamination. (K)
- 32. How many ATP molecules are required for the production of each ammonia molecule during ammonification?(K)
- 33. Which is the source of ATP for reduction of nitrogen in to ammonia? (K)
- 34. Name the element which helps in opening and closing of stomata. (K)
- 35. Name the element which activates enzyme Nitrogenase in symbiotic nitrogen fixation. (K)
- 36. Give an example of non leguminous plant with root nodules. (K)

TWO MARKS QUESTIONS:

- 1. All the elements found in the plants are not essential elements. Justify the statement. (A)
- 2. Draw a labelled diagram to show a typical set-up for nutrient solution culture. (S)
- 3. Mention the physiological role and deficiency symptoms of phosphorus.(K)

- 4. Mention the physiological role and deficiency symptoms of nitrogen.(K)
- 5. Mention the physiological role and deficiency symptoms of potassium.(K)
- 6. Mention the physiological role and deficiency symptoms of calcium.(K)
- 7. Mention the physiological role and deficiency symptoms of magnesium.(K)
- 8. Mention the physiological role and deficiency symptoms of sulphur.(K)
- 9. Mention the physiological role and deficiency symptoms of Iron.(K)
- 10. Mention the physiological role and deficiency symptoms of manganese.(K)
- 11. Mention the physiological role and deficiency symptoms of copper.(K)
- 12. The presence of any element in excess may induce the deficiency of some other element. How?(A)
- 13. Mention any four organic substances found in plants in which nitrogen is one of the constituents.(U)
- 14. Mention any four sources of nitrogen oxides in nature. (K)
- 15. What is nitrification? Mention the names of any two nitrifying bacteria. (K)
- 16. What are chemoautotrophs? Give two examples. (K)
- 17. Explain the process of nitrification. (U)
- 18. Explain the fate of nitrate in the plants. (U)
- 19. What are nitrogen fixers? Give two examples. (K)
- 20. Differentiate between free living and symbiotic nitrogen fixers. (U)
- 21. Name two free living nitrogen fixing bacteria. (K)
- 22. Name two cyanobacteria which are free living nitrogen fixers. (K)
- 23. Give two examples of symbiotic nitrogen fixers. (K)
- 24. What are root nodules? Mention two plants in which root nodules are found. (K)
- 25. Leg-haemoglobin acts as oxygen scavenger. Justify the statement.(A)
- 26. The symbiotic nitrogen fixers like Rhizobium can live as both aerobes and anaerobes. Explain.(A)
- 27. Explain reductive amination. (U)
- 28. Explain transamination. (U)
- 29. Name the two amides which are the structural parts of proteins in plants. (K)
- 30. Name the compounds which have more nitrogen content than amino acids in plants. (K)
- 31. Differentiate between macronutrients & micronutrients. Give two examples for each. (U)
- 32. Name any two denitrifying bacteria. (K)

THREE MARKS QUESTIONS:

- 1. Explain the criteria for considering an element as essential.(U)
- 2. While conducting hydroponics experiment purification of water and nutrient salts is essential. Why?(A)
- 3. 'All elements which are present in a plant need not be essential to its survival'. Comment. (A)

4. In some plants, deficiency symptoms appear first in younger parts while in some plants they appear in older parts . Why?(U)

5. What is leg – haemoglobin? Explain its role in symbiotic nitrogen fixation.(U)

6. The activity of the enzyme nitrogenase requires anaerobic condition. How this condition is met in the root nodules? (A)

- 7. What are beneficial elements? Give any four examples. (K)
- 8. Deficiency symptoms appear both on older & younger tissues. Substantiate with reasons. Give examples. (A)

9. Mobility of elements within plants is of great significance and importance to agriculture and horticulture. Explain. (U)

10. What is flux? Differentiate between influx and efflux. What are the major metabolic functions of essential elements? (K)

- 12. List three elements which act as activators of enzymes. Give three examples to substantiate it.(K)
- 13. Which are the three different means by which atmospheric nitrogen is fixed into soil? (K)

FIVE MARKS QUESTIONS:

- 1. With a neat labelled diagram explain hydroponics method to study essentiality of an element. (S)
- 2. Explain the different categories of essential elements based on their diverse functions. (U)
- 3. Explain the physiological role of the following elements. (U)
- a) Nitrogen b) Phosphorous c) Potassium d) Calcium e) Magnesium 4. Explain the physiological role of the following elements.(U) e) Copper
- a) Sulphur b) Iron c) Manganese d) Zinc
- 5. Explain the physiological role and deficiency symptoms of (U) a) Nitrogen b) Phosphorous
- 6. Explain the physiological role and deficiency symptoms of (U) b) Potassium a) Sulphur
- 7. Explain the mechanism of mineral absorption by plants.(U)
- 8. Schematically represent nitrogen cycle. (S)
- 9. Explain nitrogen cycle occurring in nature. (U)
- 10. Explain the steps involved in the conversion of nitrogen in to nitrates.(U)
- 11. Explain the process of nodule formation in leguminous plants.(U)
- 12. Draw labelled diagrams of formation of root nodules in leguminous plants.(S)
- 13. With suitable reactions explain how nitrogen is reduced to ammonia by the enzyme Nitrogenase. (U)
- 14. Explain how ammonia is used up in the production of amino acids in plants.(U)
- 15. Explain amino acid biosynthesis in plants.(U)