

CBSE TEST PAPER-02
CLASS - XI BIOLOGY
(Mineral Nutrition)

General Instruction:

- All questions are compulsory.
 - Question No. 1 to 4 carry one marks each. Question No. 5 to 8 carry two marks each. Question No. 9 and 10 carry three marks each. Question No. 11 carry five marks.
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1. Name any two elements having toxic effect on protoplasm?

2. What is hydroponics?

3. Define Transamination.

4. Give the function of enzyme nitrate reductase.

5. What is balanced nutrient solution?

6. What are macronutrients and micronutrients?

7. What is nitrification? Name any two nitrifying bacteria in soil?

8. In what form is magnesium absorbed by plants from the soil. Given two functions of magnesium in plants & its deficiency symptoms.

9. Differentiate between active & passive absorption.

10. List the criteria for essentiality of elements as nutrient in plants.

11. Write role of different elements in a plant?

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[ANSWERS]

Ans 01. Lead, mercury and arsenic.

Ans 02. Plant growth in nutrient rich liquid culture medium.

Ans 03. It involves the transfer of amino group from one amino acid to the keto group of a keto acid. catalyzed by enzyme transaminase.

Ans 04. It reduces nitrate ions to ammonia.

Ans 05. Balanced nutrient solution or balanced salt solution is prepared by dissolving definite proportions of salts in distilled water needed for normal plant growth. The plants growing in these solutions survive much longer as they get all essential as well as the trace elements from medium.

Ans 06. **MACRONUTRIENTS:** Nutrients required in large amounts by plant tissues (in excess of 10mmoleKg^{-1}) eg. C,H,N,O,P,K,N,S,Ca and Mg.

MICRONUTRIENTS: Nutrients required in very small amounts (less than 10mmoleKg^{-1}) eg. Fe, Mn, Cu, Mo, Zn, B,Cl and Ni.

Ans 07. Nitrification is the process of conversion of ammonia into nitrites. It involves two steps:-

(i) Ammonium ions are oxidized into nitrates by the bacteria like Nitrosomonas and Nitrosococcus.

(ii) Nitrites are converted into nitrates by the bacteria like Nitrobacter.

Ans 08. Magnesium is absorbed by the plants from the soil in the form of divalent Mg^{2+} .

Functions –

1) Synthesis of DNA and RNA.

2) It activates enzymes in respiration and photosynthesis.

Deficiency symptoms –

1) Chlorosis between the leaf veins.

2) Premature leaf abscission.

Ans 09.

	Active Absorption	Passive Absorption
1.	Absorption of minerals is against the concentration gradient.	Absorption of minerals is along the concentration gradient by simple diffusion.
2.	Energy is utilized for absorption.	Energy is not utilized for absorption
3.	It is fast.	It is slow.
4.	It is unidirectional.	It may be bidirectional.
5.	It is a biochemical process.	It is a physical process.

Ans 010. Criteria for essentiality of element are following-

- 1) The element must be absolutely essential for supporting normal growth and reproduction.
- 2) The requirement are need of the element must be specific and not replaceable by another element.
- 3) An element should be directly involved in the metabolism of the plant.

Ans 11. Some important functions of mineral elements are –

- (1) Maintenance of the osmotic pressure in the plant cells – The mineral salts and organic compounds of the cell sap produce necessary osmotic pressure.
- (2) Constituents of the plant body – Elements form constitution of the plant body. For ex – Carbon, Hydrogen and oxygen are essential constituents of carbohydrates. Hence, called framework elements. Nitrogen, sulphur and phosphorous are required for synthesis of proteins. Magnesium is important constituent of chlorophyll.
- (3) Influence on the PH of the cell sap – They also influence the PH of the cell sap.
- (4) They influence the permeability of cytoplasmic membrane – They increase or decrease the permeability of the plasma membrane.
- (5) They take part in enzymatic reactions – some elements work as activators while the others works as inhibitors in various enzymatic reactions.
- (6) They have balancing functions reactions – some of the minerals balance the effects of the other.