

EXERCISE-I

Methods to Study the Mineral Requirements of Plants

- If a dried leaf is taken in a crucible and heated to 600 °C a gray colored powder is left behind. It is referred to as
(A) Wilting percentage
(B) Protein content of the plant
(C) Plant ash
(D) Dry weight
- Which one of the following scientists used the nutrient culture solution in hydroponic cultures
(A) Sachs (B) Webster
(C) Wallace (D) Knop
- Which group of element is not essential for a normal plant
(A) Potassium, calcium, magnesium
(B) Iron, zinc, manganese, boron
(C) Lead, nickel, iodine, sodium
(D) Magnesium, iron, molybdenum
- The charcoal culture experiment is better than water culture experiment because
(A) Plants get support
(B) Problem of aeration is removed
(C) Charcoal is an inert substance
(D) All the above
- Technique of growing plants without soil in nutrient solutions is called
(A) Parthenogenesis (B) Hydroponics
(C) Aquaculture (D) Tissue culture
- Which of the following element is not essential for plants
(A) Iron (B) Zinc
(C) Potassium (D) Iodine
- Which of the following is not caused by deficiency of mineral nutrition
(A) Necrosis
(B) Chlorosis
(C) Etiolation
(D) Shortening internode
- Hydroponics is a
(A) Soilless culture (B) Water less Culture
(C) Airless culture (D) None of these
- Cultivation by sand culture is also called
(A) Soilless cultivation (B) Green house effect
(C) Photorespiration (D) None of these
- Who gave the criteria of essentiality
(A) R. Hill (B) F.F. Blackman
(C) M.P. Kaushik (D) D.L. Arnon
- Inorganic nutrients are present in the soil in the form of
(A) Molecules
(B) Atoms
(C) Electrically charged ions
(D) Parasite
- Phytotron is a device
(A) To grow plants in controlled conditions
(B) For fish culture
(C) For bee culture
(D) To grow silkworm
- Tracer elements are
(A) Micro elements (B) Macro-elements
(C) Radio isotopes (D) Vitamins
- Which of the following is used as green manure
(A) Azolla (B) Azadiracta indica
(C) Crotalaria juncea (D) Hevea brasiliensis
- The number of essential elements required for normal growth of plant is
(A) 10 (B) 16
(C) 20 (D) 25

Essential Mineral Elements

- Carbon become available to crop plants in the form of
(A) Amino acids (B) Carbonates
(C) Carbon dioxide (D) Element carbon
- Which element forms part of structure of chlorophyll molecule
(A) Fe (B) Mg
(C) K (D) Mn

18. Death of stem and root tips occur due to deficiency of
(A) Phosphorus (B) Calcium
(C) Nitrogen (D) Carbon
19. Sinigrin pungent principle of mustard is due to
(A) Alkyls containing cyanide radicle
(B) Glycoside containing sulphur
(C) Glycoside containing amino group
(D) Tannins containing nitrogen
20. Plants requiring two metallic compounds (minerals) for chlorophyll synthesis, are
(A) *Fe* and *Ca* (B) *Fe* and *Mg*
(C) *Cu* and *Ca* (D) *Ca* and *K*
21. Which of the following is essential mineral element and is not a constituent of any enzyme but stimulate the activity of many enzymes
(A) *Zn* (B) *Mg*
(C) *Mn* (D) *K*
22. In plants a common symptom caused by deficiency of *P*, *K*, *Ca* and *Mg* is the
(A) Bending of leaf tip
(B) Formation of anthocyanin
(C) Poor development of vasculature
(D) Appearance of dead necrotic areas
23. Chlorosis occurs when plants are grown in
(A) Dark
(B) Shade
(C) Strong light
(D) *Fe* free medium or (due to lack of iron or magnesium)
24. Which of the following amino acids contain sulphur
(A) Asparagin (B) Serine
(C) Proline (D) Methionine
25. The possible resource of phosphorus ions and nitrogen ions in soil generally get depleted because they are usually found as
(A) Positively charged ions
(B) Negatively charged ions
(C) A disproportionate mixture of negatively charged ions
(D) Particles carrying no charge
26. Which of the following does NPK denote
(A) Nitrogen, potassium, kinetin
(B) Nitrogen, protein, kinetin
(C) Nitrogen, protein, potassium
(D) Nitrogen, phosphorus, potassium
27. In nature, organic compounds invariably contain
(A) carbon (B) Phosphorus
(C) Sulphur (D) Magnesium
28. With reference to soil critical element means
(A) Nitrogen and phosphorus
(B) Nitrogen and potassium
(C) Potassium and chlorine
(D) Nitrogen, phosphorus and potassium
29. Which of the element is not essential for plant growth
(A) Nitrogen (B) Sulphur
(C) Sodium (D) Potassium
30. In guard cells, presence of potassium is essential for
(A) Maintaining osmotic pressure
(B) In controlling cell division
(C) In enzymatic reactions
(D) All the above
31. Green plants use the sulphur in the form of
(A) Pure form (B) As sulphates
(C) As sulphite (D) All the above
32. By the use of sulphur
(A) Development of root is normal
(B) Root development is reduced
(C) Root development is increased
(D) Root dry
33. In darkness the stomata close because
(A) Potassium deposits in the guard cells
(B) Guard cells loose potassium
(C) Starch is converted into sugar
(D) None of these
34. Which of the following is a component of middle lamella
(A) Zinc (B) Boron
(C) Calcium (D) Phosphorus

35. Calcium can effect
 - (A) Permeability of plasma membrane
 - (B) Hydration of colloids
 - (C) Translocation of carbohydrates and amino acids
 - (D) Development of root
36. Which of the following is not absorbed through soil
 - (A) Carbon
 - (B) Nitrogen
 - (C) Potassium
 - (D) All the above
37. In maize grains the percentage of sulphur is
 - (A) 93
 - (B) 68
 - (C) 59
 - (D) 26
38. In plants sulphur is found as
 - (A) Fast moving
 - (B) Moving
 - (C) About non-moving
 - (D) None of the above
39. Cabbage plant absorbs phosphorus from
 - (A) Dry soil
 - (B) Water irrigated soil
 - (C) From phosphate rocks
 - (D) None of these
40. Plants absorb phosphates as
 - (A) Soluble phosphate
 - (B) All phosphates
 - (C) Phosphoric acid
 - (D) As element
41. Which of the following is required for binding protein with nucleic acid
 - (A) Nickel
 - (B) Iron
 - (C) Cobalt
 - (D) Calcium
42. Deficiency of which of the following element cause weakening of pedicel and petiole
 - (A) Magnesium
 - (B) Zinc
 - (C) Nitrogen
 - (D) Calcium
43. Magnesium is mainly present in the form of
 - (A) Citrate
 - (B) Bicarbonate
 - (C) Carbonate
 - (D) Phosphate
44. Phosphorus works as carrier of
 - (A) Cobalt
 - (B) Zinc
 - (C) Magnesium
 - (D) Copper
45. Yellowing of tea leaf takes place by the deficiency of
 - (A) Chlorine
 - (B) Potassium
 - (C) Oxygen
 - (D) Sulphur
46. Which of the following is considered to be the elements between macro-nutrients and micro-nutrients
 - (A) Iron
 - (B) Nitrogen
 - (C) Phosphorus
 - (D) Manganese
47. The cause of special flavour in onion and garlic is due to the presence of
 - (A) Sulphur
 - (B) Phosphorus
 - (C) Potassium
 - (D) Nitrogen
48. Potassium is useful in development of
 - (A) Fibre
 - (B) Pith
 - (C) Parenchyma
 - (D) None of these
49. Which one is inorganic nutrient
 - (A) Protein
 - (B) Calcium
 - (C) Cellulose
 - (D) Vitamin
50. Frame work elements in plants are
 - (A) Magnesium, copper and iron
 - (B) Copper, carbon and oxygen
 - (C) Manganese, calcium and nitrogen
 - (D) Carbon, hydrogen and oxygen
51. Absence of Mg^{++} ions from plants tissue results in
 - (A) Plasmolysis
 - (B) Hydrolysis
 - (C) Chlorosis
 - (D) Necrosis
52. Which of the following is not a macro-nutrient
 - (A) *Mn*
 - (B) *Ca*
 - (C) *Mg*
 - (D) Phosphorus
53. Presence of phosphorus in a plant
 - (A) Brings about healthy root growth
 - (B) Promotes fruit ripening
 - (C) Retards protein formation
 - (D) None of the above
54. Essential macroelements are
 - (A) Absorbed from soil
 - (B) Manufactured during photosynthesis
 - (C) Produced by enzymes
 - (D) Produced by growth hormones
55. The major role of phosphorus in plant metabolism is
 - (A) To generate metabolic energy
 - (B) To evolve oxygen during photosynthesis
 - (C) To evolve carbon dioxide during respiration
 - (D) To create anaerobic conditions

56. A trace element is an element which
 - (A) Is a radioactive and can be traced by Geiger counter
 - (B) Is required in very minute amounts
 - (C) Draws other element out of protoplasm
 - (D) Was one of the first to be discovered in protoplasm
57. Micro-nutrients are
 - (A) Less important in nutrition than macro-nutrients
 - (B) As important in nutrition as macro-nutrients
 - (C) May be omitted from culture media without any detrimental effect on the plant
 - (D) Called micro because they play only minor role in nutrition
58. Deficiency of molybdenum cause
 - (A) Poor development of vasculature
 - (B) Bending of leaf tip
 - (C) Yellowing of leaves
 - (D) Mottling and necrosis of leaves
59. Which of the following is a micro-nutrient or a trace element

(A) <i>Mg</i>	(B) <i>Zn</i>
(C) <i>Ca</i>	(D) <i>P</i>
60. Photosynthetic photolysis of water takes place in presence of

(A) <i>Mn</i>	(B) <i>Cl</i>
(C) Both (A) and (B)	(D) None of the above
61. Copper is the component of

(A) Cytochrome oxidase	(B) Plastocyanin
(C) Both (A) and (B)	(D) None of the above
62. Which of the following is widely used metal cofactor

(A) Ca_2	(B) Al_3
(C) Ni_{2+}	(D) Mg_{3+}
63. The cauliflower become brown due to deficiency of

(A) Sodium	(B) Calcium
(C) Boron	(D) Nitrogen
64. Apple fruit develop internal cork due to deficiency of

(A) Magnesium	(B) Iron
(C) Manganese	(D) Boron
65. Top rot of tobacco is due to deficiency of

(A) Iron	(B) Manganese
(C) Molybdenum	(D) Boron
66. Fall of immature leaf is due to the deficiency of

(A) Sulphur	(B) Phosphorus
(C) Sodium	(D) Zinc
67. Which of the following is the importance of molybdenum in plants metabolism
 - (A) Carbon assimilation
 - (B) Nitrate reduction
 - (C) Plant breeding
 - (D) Chromosome contraction
68. Which of the following element is a component of ferredoxin

(A) <i>Cu</i>	(B) <i>Mn</i>
(C) <i>Zn</i>	(D) <i>Fe</i>
69. Deficiency of iron causes
 - (A) Bending of leaf tip
 - (B) Interveinal chlorosis first on young leaves
 - (C) Decrease of protein synthesis
 - (D) Reduced leaves and stunted growth
70. Iron is mainly absorbed in the

(A) Ferrous form	(B) Ferric form
(C) Both (A) and (B)	(D) None of these
71. Heart rot of marigold is caused by the deficiency of

(A) Chlorine	(B) Copper
(C) Boron	(D) Zinc
72. Important contribution of molybdenum is
 - (A) Flower growth
 - (B) Nitrogen fixation
 - (C) Chromosome condensation
 - (D) Carbon fixation
73. Function of zinc is
 - (A) Synthesis of chlorophyll
 - (B) Biosynthesis of 3 IAA
 - (C) Closing of stomata
 - (D) Oxidation of carbohydrate

74. Cytochrome oxidase has
(A) *Mo* (B) *Fe*
(C) *Zn* (D) *B*
75. In a *Citrus* plantation, all the plants were found to be suffering from the die-back disease, spraying of fungicides was of no help. This problem was due to the deficiency of
(A) Copper (B) Gibberellic acid
(C) Zinc (D) Auxins
76. Plastocyanin is a protein containing
(A) *Mo* (B) *Zn*
(C) *Fe* (D) *Cu*
77. Which of the following are trace elements
(A) Boron and manganese
(B) Copper and zinc
(C) Chlorine and molybdenum
(D) All the above
78. The plants accept *Zn* as
(A) *Zn* (B) Zn^{2+}
(C) *ZnO* (D) ZnSO_4
79. Gray speck disease in oats takes place by the deficiency of
(A) Zinc (B) Copper
(C) Potassium (D) Manganese
80. Boron in green plants assists in
(A) Sugar transport
(B) Activation of enzymes
(C) Acting as enzyme cofactor
(D) Photosynthesis
81. Conduction of inorganic materials in plants occur mainly through
(A) Xylem (B) Phloem
(C) Sieve tube (D) None
82. Active transport from outside to inside of molecules across a membrane requires
(A) Cyclic AMP
(B) Acetyl chlorine
(C) ATP
(D) Phloroglucinol
83. Ion uptake is called active because
(A) Ions are active
(B) Energy is expended
(C) Ions move freely
(D) Ions move passively
84. Plants absorb mineral salts from the soil solution through
(A) A semipermeable membrane into the cytoplasm
(B) Perforation at the apex of root hair cells
(C) The cell wall which is semipermeable
(D) None of these
85. The theory which suggest that the CO_2 produced in respiration plays an important role in mineral absorption
(A) Contact exchange theory
(B) Carbonic acid exchange theory
(C) Active absorption theory
(D) None the above
86. All mineral salts are absorbed in cells as
(A) Ions (B) Atoms
(C) Molecules (D) All the above
87. The process by which minerals are absorbed is
(A) Active absorption (B) Passive absorption
(C) Both (A) and (B) (D) None of the above
88. Diffusion is a type of
(A) Active absorption
(B) Passive absorption
(C) Irregular absorption
(D) Indefinite absorption
89. Entry of mineral ions in plant root cells by diffusion is
(A) Passive absorption (B) Active absorption
(C) Osmosis (D) Endocytosis
90. Active uptake of minerals by roots mainly depends on the
(A) Availability of oxygen
(B) Light
(C) Temperature
(D) Availability of carbon dioxide

Mechanism of Absorption of Elements

91. Roots absorb minerals from soil by
(A) Diffusion
(B) Donnan equilibrium
(C) Transfusion
(D) Active absorption
92. Which of the following does not require carrier molecule during transport through cell membranes
(A) Diffusion
(B) Na^+ and K^+ transport
(C) Active transport of sugars and amino acids
(D) None of the above
93. By which method ions are absorbed by plants
(A) By difference in DPD
(B) By difference in water potential
(C) By carriers and pumps
(D) By molecular diffusion
94. Nobel prize of 1991 for discovering the single ion channels in cell was awarded to
(A) Waston and Hargobind Khorana
(B) Erwin Neher and Bert Stakmann
(C) Nirenberg and Kornberg
(D) Holley and Matthaei
95. In the light of carrier concept, the transport of ion across the membrane is
(A) Passive process
(B) Non-osmotic process
(C) Osmotic process
(D) Active process
96. Most of the plants obtain or absorb nitrogen from soil in the form of
(A) Free nitrogen gas (B) Nitric acid
(C) Nitrite (D) Nitrates
97. Which of the following deficiency may cause the reduction in the growth of leaves
(A) Nitrogen (B) Sodium
(C) Manganese (D) Iron
98. The possibility of increase of infectious disease become more due to more supply of
(A) Potassium (B) Magnesium
(C) Copper (D) Nitrogen
99. Cell elongation is adversely affected by
(A) Sodium (B) Cobalt
(C) Manganese (D) Nitrogen
100. Nitrogen is a component of
(A) Protein (B) Chlorophyll
(C) Nucleic acid (D) All the above
101. An important essential element is necessary in plants for protein synthesis
(A) Calcium (B) Phosphorus
(C) Magnesium (D) Nitrogen
102. Element required by plant in large quantity is
(A) Nitrogen (B) Calcium
(C) Sulphur (D) Phosphorus
103. Nitrogen is an important constituent of
(A) Proteins (B) Lipids
(C) Carbohydrates (D) Polyphosphates
104. One of the ways in which the nitrogen of atmosphere is converted into nitrate for plants is by the action of
(A) Temperature (B) Lightning
(C) Denitrifying bacteria (D) Decay
105. Which one of the following plant cannot fix atmospheric nitrogen directly
(A) Bean (B) Castor
(C) Gram (D) Pea
106. Ammonium sulphate is
(A) Enzyme (B) Fertilizer
(C) Weed killer (D) Pesticide
107. Which one of the following can fix atmospheric nitrogen directly
(A) Pea (B) *Brassica*
(C) Castor (D) *Petunia*
108. Members of bean family are particularly important for rotation of crop, because
(A) They add green manure
(B) They add nitrates to soil
(C) They make soil porous
(D) They add calcium to soil
109. Nodules with nitrogen fixing bacteria are present in
(A) Cotton (B) Gram
(C) Wheat (D) Mustard

Metabolism of Nitrogen

110. Legume plants are important because they

- (A) Help in NO_2 fixation
- (B) Not help in NO_2 fixation
- (C) Increased soil fertility
- (D) All of these

Special modes of nutrition

111. A plant that manufactures its own food is

- (A) Autotroph
- (B) Parasite
- (C) Epiphyte
- (D) Saprophyte

112. Plants which are unable to manufacture their food wholly or partially are

- (A) Autophytes
- (B) Heterophytes
- (C) Halophytes
- (D) Holophytes

113. Plants that grow over the branches of trees without contact with soil are

- (A) Epiphytes
- (B) Symbionts
- (C) Saprophytes
- (D) Parasites

114. Epiphytes are the plants which are dependent on other plants

- (A) Only for water
- (B) For water and food
- (C) Only for food
- (D) Only for shelter (support)

115. Partial parasite is dependent upon the host for

- (A) Support
- (B) Food at times
- (C) Water
- (D) Water and minerals

116. *Cuscuta* is

- (A) Total root parasite
- (B) Total stem parasite
- (C) Partial stem parasite
- (D) Epiphyte

117. Lianas occur more commonly in

- (A) Temperate forests
- (B) Deserts
- (C) Alpine vegetation
- (D) Tropical forests

118. Myrmecophily is a beneficial association between a flowering plant and

- (A) Ants
- (B) Mycoplasma
- (C) Bacteria
- (D) Viruses

119. Insectivorous plants usually grow in soils which are deficient in

- (A) Nitrogen
- (B) Water
- (C) Organic matter
- (D) Ca/Mg

120. *Viscum* is

- (A) Partial root parasite
- (B) Partial stem parasite
- (C) Total root parasite
- (D) Total stem parasite

121. *Drosera* catches insects by means of

- (A) Bladder
- (B) Pitcher
- (C) Tentacles secreting shining liquid
- (D) Adhesive disc

122. *Balanophora/Orobancha* is a

- (A) Total root parasite
- (B) Partial root parasite
- (C) Partial stem parasite
- (D) Total stem parasite

123. *Santalum album* is

- (A) Partial root parasite
- (B) Partial stem parasite
- (C) Total stem parasite
- (D) Total root parasite

124. Biggest flower belongs to a plant which is

- (A) Partial stem parasite
- (B) Partial root parasite
- (C) Total stem parasite
- (D) Total root parasite

125. *Loranthus* is a

- (A) Total stem parasite
- (B) Partial stem parasite
- (C) Total root parasite
- (D) Partial root parasite

126. Majority of the orchids are

- (A) Epizoics
- (B) Epiphytes
- (C) Saprophytes
- (D) Parasites

127. Botanical name of Venus Fly Trap is

- (A) *Aldrovanda*
- (B) *Dionaea*
- (C) *Utricularia*
- (D) *Nepenthes*

- 128.** One of the following in an insectivorous plant
 (A) *Balanophora* (B) *Orobancha*
 (C) *Rafflesia* (D) *Drosera*
- 129.** *Drosera* and *Sarracenia* are
 (A) Symbiotic (B) Carnivorous
 (C) Parasitic (D) Chemoautotrophic
- 130.** A plant growing on another plant without drawing any nourishment is
 (A) Ectoparasite (B) Epiphyte
 (C) Symbiont (D) Saprophyte
- 131.** Heterotrophic nutrition is present in
 (A) *Vallisneria* (B) *Pistia*
 (C) *Drosera* (D) *Opuntia*
- 132.** Plants obtaining food from other plants by means of haustoria are
 (A) Symbionts (B) Parasites
 (C) Hydrophytes (D) Saprophytes
- 133.** Insects captured by carnivorous plants partially meet their requirement of
 (A) Organic matter (B) Enzymes
 (C) Water (D) Nitrogen
- 134.** *Nepenthes* is
 (A) Both producer and primary carnivore
 (B) Producer
 (C) Consumer
 (D) None of these
- 135.** *Rhizophora* is an example of
 (A) Lithophyte
 (B) Fresh water aquatic
 (C) Mesophyte
 (D) Halophyte
- 136.** A plant living symbiotically inside another plant is
 (A) Saprophyte (B) Endophyte
 (C) Semiparasite (D) Parasite
- 137.** Which is not an insectivorous plant
 (A) *Dionaea* (B) *Dischidia*
 (C) *Drosera* (D) *Pinguicula*
- 138.** A pair of insectivorous plants is
 (A) *Drosera* and *Rafflesia*
 (B) *Nepenthes* and Bladderwort
 (C) *Dionaea* and *Viscum*
 (D) Venus fly trap and *Rafflesia*
- 139.** One of the following is saprophytic angiosperm
 (A) *Rafflesia* (B) *Cuscuta*
 (C) *Loranthus* (D) *Monotropa*
- 140.** Which one of the following is a parasitic plant
 (A) *Drosera* (B) *Cuscuta*
 (C) *Nepenthes* (D) *Utricularia*
- 141.** An insectivorous plant is
 (A) *Opuntia* (B) *Crotalaria*
 (C) *Eichhomia* (D) *Utricularia*
- 142.** *Dionaea muscipula* is
 (A) Venus fly trap (B) Butterwort
 (C) Water fly trap (D) Bladderwort
- 143.** Select the one, which is pitcher plant
 (A) *Drosera* (B) *Utricularia*
 (C) *Sarracenia* (D) *Aldrovanda*
- 144.** Which one is the largest root parasite
 (A) *Rafflesia* (B) *Monotropa*
 (C) *Arceuthobium* (D) All of these
- 145.** Pitcher plant is
 (A) Herbivorous (B) Carnivorous
 (C) Saprotroph (D) All of these
- 146.** *Nepenthes khasiana* is a/an
 (A) Fungicidal and wet land plant
 (B) Insectivorous and endangered plant
 (C) Fungicidal and endangered plant
 (D) Insectivorous and wet land plant
- 147.** A rootless aquatic in which a portion of leaf is modified to form a bladder for catching small aquatic animals is
 (A) *Dionaea* (B) *Drosera*
 (C) *Utricularia* (D) *Nepenthes*
- 148.** Insectivorous plants catch and digest insects for
 (A) Obtaining nitrogen
 (B) Protecting their leaves
 (C) Protecting their fruits
 (D) Being heterotrophs of consumer level
- 149.** Insectivorous plant with rosette of spiny margined bilobed hinged and winged leaves for catching the prey is
 (A) *Nepenthes* (B) *Drosera*
 (C) *Dionaea* (D) *Utricularia*
- 150.** Bird of Paradise flower is
 (A) *Ravenea madagascariensis*
 (B) *Sterilitzia reginae*
 (C) *Heliconia schlideana*
 (D) *Musa chinensis*