GPLUS EDUCATION

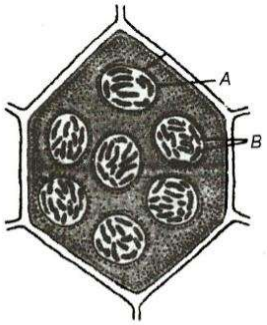
Date :
Time : **BIOLOGY**
Marks :

MINERAL NUTRITION

Single Correct Answer Type

1. Enzyme nitrogenase is responsible for
   a) Nitrification b) Nitrogen fixation c) Nitrite reduction d) Nitrate reduction
2. Nitrifying bacteria
   a) Liberate ammonia b) Change ammonia into ionic form
   c) Oxidise ammonia to nitrate d) Oxidise ammonia to nitrite
3. Plants growing near the nuclear test sites take up and accumulate which of the following elements?
   a) Gold b) Selenium c) Strontium d) All of these
4. Name the minerals responsible for maintaining cation-anion balance in the plant cells
   a) K^+ and Fe^{+3} b) Cl^- and K^+ c) Ca^{+2} and Mg^{+2} d) Cl^- and Mg^{+2}
5. What is the major function of air stone?
   a) Remove CO_2 content from the nutrient solution b) Dissolves O_2 in the nutrient solution
   c) Increases the level of N_2 in the nutrient solutions d) Removes O_2 from the nutrient solution
6. In hydroponic vegetables, the pH preferred by most vegetable is slightly
   a) Alkaline b) Neutral c) Acidic d) Basic
7. Which of the following are considered as the roles of iron (Fe) in plants?
   I. Important constituent of cytochrome
   II. Activator of catalase
   III. Essential for chlorophyll synthesis
   Choose the correct option
   a) Only I b) Only III c) Only II d) All of these
8. By applying which of the following practices, contamination of hydroponics plants can be reduced?
   a) Change the medium every week b) Do not use tools from the outdoor garden
   c) Complete aeration in hydroponic tank d) All of the above
9. An essential element is that which
   a) Improves health of the plant b) Is irreplaceable and indispensable for growth of plants
   c) Is found in plant ash d) Is available in the soil
10. Essential elements perform many functions which includes
    I. Permeability of the cell membrane
    II. Maintenance of osmotic concentration of the cell sap
    III. Major constituents of macromolecules and coenzymes
    IV. Buffering action
    Choose the correct option
    a) Only III b) I and III c) Only I d) I, II and III
11. Which of the following metals causes harmful effects?
    a) Lead b) Cobalt c) Uranium d) All of these
12. Nitrogen is mainly absorbed in the form of
    a) Nitrate b) Nitrite c) Ammonium d) All of these
13. In the initial phase of minerals absorption ions are taken up
    a) Slowly b) Rapidly c) Fluently d) Simultaneously

14. Which of the following is true regarding manganese toxicity in plants?
    a) Induction deficiencies of iron, magnesium and calcium
    b) Appearance of brown spots surrounded by chlorotic veins
    c) Inhibition of Ca^{2+} ions translocation in the shoot apex
    d) All of the above
15. Sulphur is found as a constituent in which of the following amino acids?
    a) Cysteine b) Methionine c) Both (a) and (b) d) None of above
16. What is the key principle of the EBB and flow system in hydroponics?
    a) It floods and drains periodically
    b) It makes a tide flowing over the roots
    c) It sprays a mist of nutrients on the roots
    d) None of the above
17. Hydroponics has been successfully employed as a technique for which of the following vegetables?
    a) Seedless cucumber b) Tomato c) Lettuce d) All of these
18. For the uptake of ions in the second phase of absorption of minerals, the pathway followed is called
    a) Passive uptake b) Active uptake c) Neutral d) None of these
19. How many essential mineral elements have been discovered yet?
    a) 17 b) 107 c) 110 d) 150
20. Which of the following is a rootless aquatic plant in which a portion of the leaf forms a tiny sac for trapping insects?
    a) Nepenthes b) Drosera c) Utricularia d) Dionaea
21. Which of the given options are correct for hydroponics? Select the correct pair
    I. Hydroponics technique is useful in areas having infertile and dry soils
    II. Hydroponics can regulate pH optimum for a particular crop
    III. It increases the labour cost
    IV. It increases the problem of weeding
    a) I and IV b) I and II c) I and III d) Only I
22. Phosphorus is absorbed by the plants as
    I. $H_2PO_4^-$ II. HPO_4
    III. HPO_4^{2-} IV. H_2PO^-
    a) Only I b) Only III c) I and III d) Only II
23. Insectivorous plants eats the insect for
    a) Na-K b) Nitrogen c) Chlorine d) Phosphorus
24. Aeroponics are
    a) Aerial plants b) Aerated plants
    c) Soilers cultivated plants d) None of these
25. Given diagram belongs to bacteroids in nodule. Identify A and B and choose the correct option accordingly



    a) A-Bacteria; B-Bacteroids b) A-Leghaemoglobin; B-Bacteroides
    c) A-Bacteroids; B-Bacteria d) A-Bacteroids; B-Leghaemoglobin
26. Insectivorous plants eats insects for their requirement of
    a) Sodium-potassium b) Nitrogen c) Chlorine d) Phosphorus

27. Molybdenum is the essential constituent of
    a) Nitrogenase b) Respiratory chain c) Growth regulators d) Chlorophyll
28. Select the correct statement.
    a) Legumes are incapable of fixing nitrogen
    b) Legumes fix nitrogen through bacteria living in fruits
    c) Legumes fix nitrogen only by bacteria present in root nodules
    d) None of the above
29. Which among the following are used as media for hydroponics?
    a) Coco air b) Rock cool c) Gravel d) All of these
30. The core metal of chlorophyll is
    a) Fe b) Mg c) Ni d) Cu
31. Identify the elements which functions as the components of biomolecules
    I. Hydrogen II. Magnesium
    III. Oxygen IV. Nitrogen
    a) Only IV b) Only II c) I, II, III and IV d) All except II
32. Potassium is required by which of the following regions of plants
    I. Meristematic tissues II. Buds
    III. Leaves IV. Root tips
    a) Only I b) I and IV c) II and IV d) All of these
33. In root nodules of legumes, leghaemoglobin is important because it
    a) Transports oxygen to the root nodule
    b) Acts as an oxygen scavenger
    c) Provides energy to the nitrogen fixing bacterium
    d) Acts as a catalyst in transamination
34. The number of essential elements known for the growth and reproduction of plants is
    a) 27 b) 15 c) 17 d) 9
35. Which of the following minerals activate the enzymes involved in respiration?
    a) Nitrogen and phosphorus b) Magnesium and manganese
    c) Potassium and calcium d) Suluur and iron
36. Which of the following is not caused by deficiency of mineral?
    a) Chlorosis b) Etiolation
    c) Shortening of intermodes d) Necrosis
37. Crop rotation is used by farmers to increase
    a) Soil fertility b) Community area
    c) Organic content of soil d) Nitrogenous content in the soil
38. The enzyme responsible for the reduction of molecular nitrogen to the level of ammonia in leguminous root nodule is
    a) Nitrogenase b) Nitrate reductase c) Nitrite reductase d) hydrogenase
39. Soil is able to maintain a regular supply of minerals by the help of which of the following?
    I. Slow vegetation
    II. Activity of decomposers
    III. Soil erosion
    IV. Weathering of rocks
    a) Only IV b) Only I c) IV and II d) All of the above
40. Select the match ones.
    I Nitrosomonas – Nitrite to nitrate
    II Thiobacillus - Denitrification

III Nostoc - Free-living nitrogen-fixer
IV Azotobacter - Anaerobic nitrogen-fixer

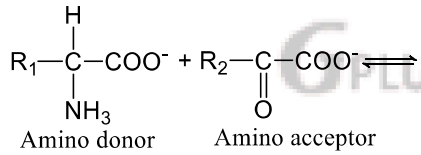
a) I and II b) III and IV c) II and III d) II and IV

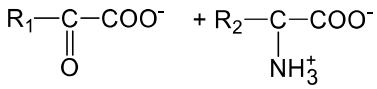
41. Which of the following option shows correct co-relation between column I, II and III?

Column I	Column II	Column III
A. Calcium	I. Required for ionic balance	(i)Grey blot on leaves
B. Boron	II. Essential for constitution of nucleic acid	(ii)Fruit-yield decreases
C. Phosphorus	III. Required for absorption of calcium	(iii)Red blot on leaves
D. Chlorine	IV. Required to active respiratory enzyme	(iv)Fruit-size diminishes
E. Manganese	V. Required for synthesis of mitotic spindle	(v)Young root tip begin to die

a) A-V-v, B-IV-iv, C-III-I, D-II-iii, E-I-ii
b) A-V-v, B-III-iii, C-II-iii, D-I-ii, E-IV-i
c) A-I-iv, B-II-v, C-III-iii, D-IV-I, E-V-ii
d) A-IV-iii, B-I-iv, C-V-v, D-III-ii, E-II-i

42. What does the given reaction shows?





Choose the correct option

a) Oxidative deamination
b) Reductive amination
c) Transamination
d) Deamination

43. In hydroponics, chelating agent is used to

a) Chelate metals
b) Provide nutrition
c) Provide non-stream conditions
d) All of the above

44. The term 'outer space' represents ...A..., while 'inner space' represents ...B... with reference to absorption of minerals

Identify A and B to complete the given statement

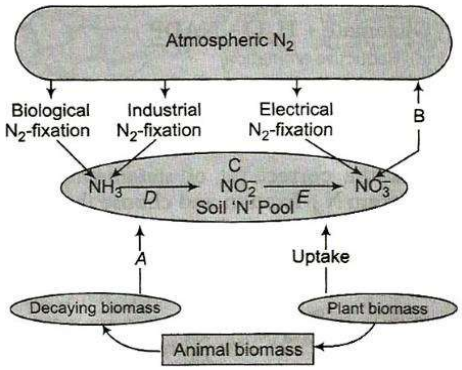
a) A-cytoplasm and vacuole, B-intercellular space and cell
b) A- intercellular space and cell wall, B- cytoplasm and vacuole
c) A-cytoplasm, B-vacuole
d) A-intercellular space, B-vacuole

45. Hydroponic tomatoes may not taste so fresh. Why?

a) The tomatoes are really potatoes in disguise
b) The tomatoes are supposed to be green and sour, it makes them healthier for humans
c) They are picked too soon
d) They are not picked soon enough

46. Which of the following is used as a chelating agent in hydroponics?
a) EDTA b) Iron c) Nitrogen d) Copper

47. Identify the labels in the given flow diagram which links the major nitrogen pools
Choose the correct combination from the options given below



a) A-Nitrification, B-Ammonification, C-*Nitrobacter*; D-*Nitrosomonas*
b) A-Ammonification, B-Denitrification, C-Nitrification, D-*Nitrosomonas*, E-*Nitrobacter*
c) A-Denitrification, B-*Nitrobacter,* C-Nitrification, D-*Nitrosomonas,* E-Ammonification
d) A-*Nitrobacter,* B-Denitrification, C-*Nitrosomonas,* D-Ammonification

48. Sulphur is an important nutrient for optimum growth and productivity in
a) Pulse crops b) Cereals c) Fibre crops d) Oilseed crops

49. Which of the following are reservoirs for phosphorus and nitrogen cycle respectively?
a) Atmosphere and bedrocks b) Bedrocks and atmosphere
c) Consumers d) Atmosphere and producers

50. The organ in *Viscum* that absorb nutrients is known
a) Haustoria b) Rhizophore c) Roots d) None of these

51. Insectivorous plants live in a soil that is usually deficient in
a) Nitrate b) Chloride c) Potassium d) Magnesium

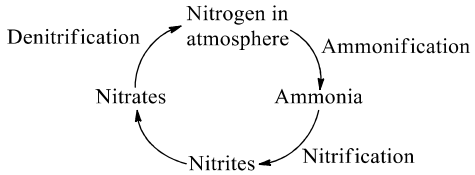
52. Humans is essential for plant growth because
a) It is rich in nutrients and increases the water holding capacity of soil
b) It increases aeration of soil
c) It increases porocity of soil
d) All of the above

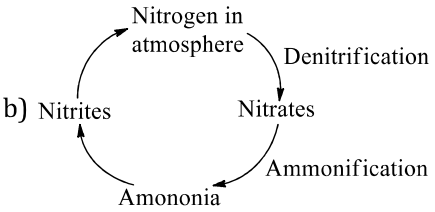
53. Read the functions given below and identify the concerned nutrient
I. Activator of catalase
II. Important constituent of cytochrome
III. Important constituent of proteins involved in ETS
IV. Essential for chlorophyll synthesis
a) Mo b) Fe c) Cu d) Ca

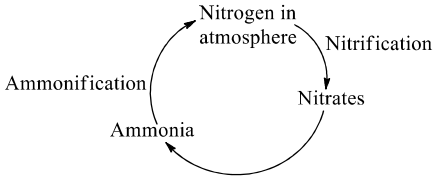
54. Nitrogen is present in the soil in the form of
I. Nitrates II. Ammonical salts
II. Nitrite IV. None of these
a) Only I b) Only III c) I and II d) Only IV

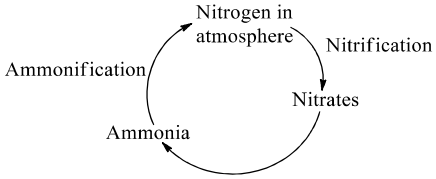
55. Which of the following diagram correctly depicts N_2-cycle?

a)



b)


c)


d)


56. The deficiencies of micronutrients not only affects growth of plants but also vital functions, such as photosynthetic and mitochondrial electron flow. Among the list given below, which group of three elements shall affect most, both photosynthetic and mitochondrial electron transport?
a) Cu, Mn and Fe b) Co, Ni and Mo c) Mn, Co and Ca d) Ca, K and Na
57. Which of the following is a bacterium involved in denitrification?
a) Nitrococcus b) Nitosomonas c) Pseudomonas d) Nitrobacter
58. The major role of minor elements inside living organisms is to act as
a) Constituents b) Binder of cell structure
c) Cofactors of enzymes d) Building blocks of important amino acids
59. Which of the following is one of the component of ATP?
a) Potassium b) Phosphorus c) Magnesium d) Manganese
60. Hydroponics is a technique of growing plants in a
a) Soil solution b) Nutrient solution c) Both (a) and (b) d) None of the above
61. Which of the following is an example of nutrient in its reduced form?
a) Hydrogen in H_2O b) Carbon in CO_2 c) Nitrogen in NH_3 d) Sulphur in SO_2
62. The source of energy for non-biological nitrogen fixation is
a) By ionizing events such as lightning and effect of cosmic rays
b) Ferredoxin enzyme and nitrogenase
c) By reduction of proteins to ammonia
d) By oxidation of ammonia to protein
63. What effect can be seen on the plant growth and reproduction in the absence of essential mineral element?
a) Plants will complete their life cycle normally
b) Plants will complete their life cycle
c) There will be no effect on the normal growth but reproduction in plants will suffer
d) Only growth will get effected not the reproduction
64. 'mottled chlorosis' on the leaves occurs due to the deficiency of
a) Nitrogen b) Phosphorus c) Potassium d) Sulphur
65. Maximum percentage of which element occurs in plant ash?
a) Magnesium b) Zinc c) Potassium d) Calcium
66. Which one of the following is an amide involved in nitrogen assimilitaion by plants?
a) Glutamate b) Alanine c) Asparagine d) Serine
67. Which of the following is considered as partial mineral elements in plants?

a) Potassium b) Phosphorus c) Nitrogen d) Iron

68. Hydroponics is the growth of plants in
a) Pure water b) Air
c) Water containing essential nutrients d) Soil

69. The major characteristics of colloids is/are
a) Charged surface b) Large surface area c) Brittle d) Both (a) and (c)

70. The enzyme responsible for the reduction of molecular nitrogen to the level of ammonia in the leguminous root nodules is
a) Amminase b) Nitrogenase c) Nitrate reductase d) Nitrite reductase

71. Mark the statements as true/ false by choosing the correct option from the set (I-IV) given below
I. Magnesium is a constituent of chlorophyll and helps to maintain the ribosome structure
II. Calcium is needed during the formation of mitotic spindle
III. Magnesium is essential for the photolysis of water
IV. Zinc helps in sugar translocation
a) I-True, II-True, III-False, IV-False b) I-False, II-True, III-False, IV-True
c) I-True, II-False, III-True, IV-False d) I-False, II-False, III-True, IV-True

72. Free living nitrogen fixing bacteria are
a) *Bacillus polymixa* b) *Rhodoseudomonas* c) *E. coli* d) *Anabaena*

73. In case of *Nitella*, H_2O, O_2, CO_2 and Na follows
a) Passive diffusion b) Facilitated diffusion
c) Mass flow d) Ionic exchange

74. Name the essential element that is considered as the component of energy related to chemical compound like chlorophyll
a) Magnesium b) Phosphorus c) Manganese d) Potassium

75. What is the correct unit for measuring nutrients in hydroponics nutrient solution?
a) Parts per million b) Parts per thousand c) Parts per trillion d) Parts per gazillion

76. Which of the following reaction shows nitrogen fixation?
a) $2NH_4 + 2O_2 + 8e^- \rightarrow N_2 + 4H_2O$ b) $2NH_3 \rightarrow N_2 + 3H_2$
c) $N_2 + 4H_2 \rightarrow 2NH_3$ d) $2N_2 +$ Glucose $\rightarrow$ 2 Amino acids

77. For the limited nitrogen that is present in the soil, microbes compete with
a) Animals b) Plants c) Both (a) and (b) d) None of these

78. Julius Von Sachs, who demonstrated hydroponics for the first time, was a German
a) Zoologist b) Mathematician c) Botanist d) Physicist

79. Farmers in a particular region were concentrated that pre-mature yellowing of leaves of a pulse crop might cause decrease in the yield. Which treatment could be most beneficial to obtain maximum seed yield?
a) Frequent irrigation of the crop
b) Treatment of the plants with cytokinins along with a small dose of nitrogenous fertilizer
c) Removal of all yellow leaves and spraying the remaining green leaves with 2, 4,5-trichlorophenoxy acetic acid
d) Application of iron and magnesium to promote synthesis of chlorophyll

80. In the hydroponics plant production technique, in order to obtain the optimum growth, nutrient solutions must be
a) Poorly aerated b) Adequately aerated
c) Diluted d) None of these

81. Based on the quantitative requirement of elements by the plants, these elements are called
a) Macronutrients b) Micronutrients c) Both (a) and (b) d) None of these

82. The number of essential nutrients needed in plants is
a) 16 b) 5 c) 4 d) 8

83. One of the following is called pitcher plant
a) *Nepenthes* b) *Aristolochia* c) *Drosera* d) *Uticularia*

84. Minerals involved in redox reactions in plant cells are
a) N, Cu b) Fe, Cu c) Ca, Fe d) Na, Cu

85. The conversion of nitrate to nitrogen is called
a) Nitrification b) Denitrification c) Ammonification d) Nitrogen fixation

86. Enzyme required for nitrogen fixation is
a) Nitrogenase b) Nitroreductase c) transaminase d) Transferase

87. For the proper management of diseased conditions in hydroponics, it is important to
a) Change and replace the nutrient solution daily
b) Change and replace the media daily
c) Remove dead leaves from the media daily
d) Both (a) and (b)

88. Which of the following statements are not correct in reference to hydroponics?
I. It determines the mineral nutrients essential for the plants
II. The hydroponics involves the culture of plants in a soil with, defined mineral solution
III. Hydroponics requires purified water with non-defined mineral nutrient salts
IV. In the hydroponics technique, plants are grown in sandy soil with nutrient solution
V. By this method, essential elements required for the growth of plants can be identified and their deficiency symptoms can also be discovered
Choose the correct options
a) Only IV b) Only V c) Only III d) None of these

89. Quantity of macronutrients that is generally found in plant is
a) Very small b) Large c) Varying d) None of these

90. Who proved for the first time that the plants contain a large number of minerals and microelements?
a) De Saussure (1804) b) Leibeg (1840)
c) Glauber and Mayhon (1650) d) Arnon and Stout (1939)

91. $N_2 + 8e^- + 8H^+ + 16ATP \rightarrow 2NH_3 + 2H^+ + 16ADP + 16Pi$
The above equation refers to
a) Ammonification b) Nitrification
c) Nitrogen fixation d) Denitrification

92. The optimum temperature preferred for the plant growth is
a) Less than 15°C b) Between 15°C and 30°C
c) Less than 10°C d) More than 30°C

93. Which of the following elements is not an essential micronutrient for plant growth?
a) Mn b) Zn c) Ni d) Ca

94. Which of the following gene is responsible for biological nitrogen fixation?
a) Nitrogenase b) *Nif* gene
c) Yeast alanine tRNA synthetase d) RNA synthetase

95. Hydroponics are of three types ...A..., a film system and ...B...
Choose the correct pair from the option given below
a) A-*in vitro*; B-tube system b) A-tube system; B-tank system
c) A-tank system; B-aeroponics d) A-plant tissue culture; B-tube system

96. Deficiency of which to the following can cause yellowing of intravenous regions of leaves?
a) Calcium b) Potassium c) Copper d) Phosphorus

97. The technique of growing plants in a nutrient solution in the complete absence of soil is called
a) Plant tissue culture b) Hydroponics c) Both (a) and (b) d) None of these

98. Who demonstrated the concept of hydroponics for the first time?
a) Hewitt b) Julius von Sachs c) Dalton d) None of these

99. Appearance of yellowish edges in the leaves is due to deficiency of
a) Calcium b) Magnesium c) Phosphorus d) Potassium

100. VAM is
a) Ectomycorrhizae b) Endomycorrhizae
c) Both (a) and (b) d) Ectoendomycorrhizae

101. Nitrogen is required mainly by which of the following parts of the plants?
I. Meristematic tissues
II. Differentiating tissues
III. Apical tissues
IV. Metabolically active cell
Choose the correct option
a) Only II b) Only I c) I and II d) I and IV

102. Choose the correct options
a) Amides are the transported forms of nitrogen as they have more nitrogen
b) Legumes of tropical origin (*e.g.*, soyabean) transport ureides
c) The host produces globin part and bacterial symbiont produces heam part of leghaemoglobin (N_2-fixing pigment)
d) All of the above

103. Macronutrients like carbon, hydrogen and oxygen are obtained mainly from
a) CO_2 b) H_2O c) Both (a) and (b) d) Soil

104. For a seed to germinate, the most important thing needed is
a) Phosphate fertiliser b) Nitrogen
c) Water d) None of these

105. The entry and exit of ions to and from the symplast requires the expenditure of
a) Photosynthetic energy
b) Metabolic energy
c) Energy derived from ions
d) Zero amount of energy

106. A plant requires magnesium for
a) Holding cells together b) Protein synthesis
c) Chlorophyll synthesis d) Cell wall development

107. Which element is required for the germination of pollen grains?
a) Boron b) Calcium c) Chlorine d) Potassium

108. The area around the plant roots is called
a) Phyllosphere b) Rhizoplane c) Both (a) and (b) d) None of these

109. Mg^{2+} is an activator of
I. alcohol dehydrogenase
II. nitrogenase
III. ribulose bisphosphate carboxylase oxygenase
IV. phosphoenol pyruvate carboxylase
Choose the correct option
a) Only III b) Only I c) Only IV d) III and IV

110. The ultimate source of nitrogen is
a) Atmospheric nitrogen
b) Nitrogen present in soil
c) Nitrogen that comes from water
d) Nitrogen fixed by the process of photosynthesis

111. Select from the given options, which is the most commonly obtained commercial flower crop in

hydroponics?

a) Daisy b) Rose c) Lily d) Carnation

112. Which one of the following elements in plants is not remobilised?

a) Calcium b) Potassium c) Sulphur d) Phosphorus

113. The plant ash indicates

a) Organic matter of plant
b) Mineral salts absorbed by plants
c) Both mineral salts and organic matter
d) Silica absorbed by plants

114. The full form of CEA is

a) Common Environment Analysis
b) Centrally Expanded Atmosphere
c) Controlled Environment Agriculture
d) Commercial Expansion Advancement

115. In the final phase of mineral absorption, ions are taken up into the …… space of cells

a) Outer
b) Inner
c) Extra inner membrane
d) None of these

116. Major disadvantages of hydroponics include

a) Expense to set up
b) High technical knowledge
c) Both (a) and (b)
d) None of the above

117. The nutrient solution in flowering culture hydroponics

a) Is constantly recycled using a pump
b) Flows back into the loam soil in which the plant grows
c) Drains into a bucket for disposal
d) None of the above

118. Which of the following elements can be considered as macronutrients for plants?

a) Zinc b) Boron c) Nickel d) Phosphorus

119. The process of decay of dead organic matter is known as

a) Denitrification b) Nitrification c) Nitrogen fixation d) Ammonification

120. Nitrogen is absorbed by the plants in the form of

a) NO_3^- b) NH_4^+ c) Both (a) and (b) d) None of these

121. Grey spots of oat are caused by deficiency of

a) Mangenese b) Iron c) Copper d) Zinc

122. A nutritionally wild type organism, which does not require any additional growth supplement is known as

a) Phenotype b) Holotype c) Auxotroph d) Prototroph

123. Which of the following elements is considered as beneficial elements in higher plants?

a) Sodium and iron b) Silicon and potassium c) Cobalt and selenium d) All of these

124. Which of the following is limiting nutrient for both natural and agricultural ecosystems?

a) Nitrogen oxides b) Nitrogen c) Ammonia d) Hydrogen

125. Plant deficient of element zinc, shows its effects on the biosynthesis of plant growth hormone

a) Ethylene b) Abscisic acid c) Auxin d) Cytokinin

126. Julius Von Sachs, who demonstrated hydroponics first, was from

a) Germany b) Greece c) Egypt d) United States

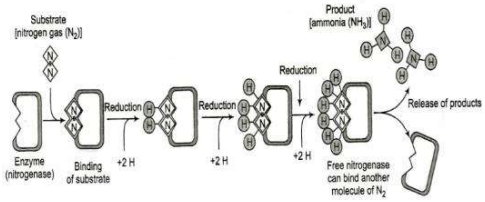
127. Which of the following is not considered as a trace element (micronutrient) in the plant?

a) Mo O_2^{-2} b) Cu^{+2} c) Mn^{+2} d) K^+

128. Maximum amount of macronutrients that are generally present in plant tissue is

a) 10.5 m mole kg^{-1} of dry matter
b) 9.5 m mole kg^{-1} of dry matter
c) 1.0 m mole kg^{-1} of dry matter
d) 10 m mole kg^{-1} of dry matter

129. Which of the following shows the deficiency symptoms of nitrogen in plants?
    a) Delaying of flowering
    b) Inhibits protein synthesis
    c) Inhibition of chloroplast formation
    d) Dormancy of lateral buds
130. Which of the following is a macronutrient?
    a) Molybdenum
    b) Calcium
    c) Zinc
    d) Manganese
131. Which of the following statements are correct about mineral absorption in plants?
    a) In the initial phase, ions are taken up into the outer space of cells, the apoplast. It is a passive process
    b) In the final phase, ions are taken slowly into the inner space, the symplast of cells and it is an active process
    c) Passive movement of the ions into the apoplast occurs through ion channels, transmembrane proteins, which acts as selective pores
    d) All of the above
132. For the uptake of ions in the first phase of absorption of minerals, the pathway followed is called
    a) Active uptake
    b) Passive uptake
    c) Neutral
    d) None of these
133. Necrosis is the term used for the
    a) Falling of leaves
    b) Delay in flowering
    c) Death of plant tissues
    d) Inhibition of cell division in plants
134. Monovalent ions $(e.g., Na^+, K^+)$ ...A... the membrane permeability while, the divalents ions (Ca^{2+}) ...B... the same
    Complete the given statement by filling appropriate option in the given below (A and B)
    a) Decrease; increase
    b) Increase; increase
    c) Decrease; decrease
    d) Increase; decrease
135. *Cuscuta* is a
    a) Parasitic plant
    b) Symbiotic plant
    c) Predator
    d) Decomposer
136. Which form of nitrogen enters in the plants
    a) Free form
    b) Fixed form
    c) Reduced form
    d) Oxidised form
137. Manganese is required in
    a) Nucleic acid synthesis
    b) Plant cell wall information
    c) Photolysis of water during photosynthesis
    d) Chlorophyll synthesis
138. Nitrite is coverted to nitrate by
    a) *Nitrosomonas*
    b) *Nitrobacter*
    c) *Pseudomonas*
    d) *Clostridium*
139. Molybdenum causes
    a) Mottling
    b) Wilting
    c) Reclamation
    d) Chlorosis
140. Pick the correct set of statements for the given diagram N_2-fixation and choose the correct option accordingly



I. Nitrogenase catalyses the reaction
II. The formation of ammonia is a reductive process
III. One molecule of nitrogen produces two molecules of ammonia
IV. Nitrate reductase catalyse the reaction
V. Formation of ammonia is an oxidative reductive process
VI. One molecule of nitrogen produces one molecule of ammonia
Which is the correct option?

a) I, II and III
b) IV, V and VI
c) I, V and VI
d) III, IV and V

141. Nitrogen is a constituent of
a) Chlorophyll
b) Hormones
c) Vitamins and amino acids
d) All of these

142. Necrosis or death if tissue particularly leaf tissue, is due to the deficiency of
a) N, K, and S
b) N, K, Mg and Fe
c) Mn, Zn and Mo
d) Ca, Mg, Cu and K

143. The function of leghaemoglobin during biological nitrogen fixation in root nodules of legumes is to
a) Convert atmospheric nitrogen to ammonia
b) Convert ammonia to nitrite
c) Transport oxygen for activity of nitrogenase
d) Protect nitrogenase from oxygen

144. The macronutrient which is an essential component of all organic compounds, yet not obtained by plants from soil is
a) Nitrogen
b) Carbon
c) Phosphorus
d) Magnesium

145. The process of transfer of amino group from one amino acid to the keto group of a keto acid is called
a) Oxidative amination
b) Reductive amination
c) Transamination
d) Deamination

146. Name the fungus that helps in N_2-fixation
a) *Rhizopus*
b) *Albugo*
c) *Puccinia*
d) *Pullularia*

147. What is the correct order of nitrogen assimilation?
a) $N_2 \rightarrow NO_2 \rightarrow NO_3 \rightarrow NH_2OH \rightarrow NH_3$
b) $N_2 \rightarrow NO_3 \rightarrow NO_2 \rightarrow NH_2OH \rightarrow NH_3$
c) $N_2 \rightarrow NO_2 \rightarrow NO_3 \rightarrow NH_3 \rightarrow NH_2OH$
d) $N_2 \rightarrow NO_3 \rightarrow NO_2 \rightarrow NH_3 \rightarrow NH_2OH$

148. Nitrification is the process of conversion of
a) Ammonia
b) Nitrite
c) Nitrate
d) All of these

149. Which of the following is a nitrogen-fixing organism?
a) BGA
b) *Rhizobium*
c) Both (A) and (B)
d) *Aspergillus*

150. Media, which is used most commonly in hydroponics is
a) Loam and clay
b) Only clay
c) Sand and soil
d) Perlite and vermiculite

151. Which of the following gene clusters in bacteria is responsible for nitrogen fixtion?
a) *Nod, nif, fix*
b) *Nod, ndf, nfx*
c) *Nod, nix, nfx*
d) *Ndx, nif, fix*

152. *Anabaena*, which is extensively used in rice cultivation, forms symbiotic association with
a) *Cycas* roots
b) *Azolla*
c) *Anthoceros*
d) *Alnus*

153. Nitrates are converted into nitrogen by
a) Nitrogen fixing bacteria
b) Sulphur fixing bacteria
c) Denitrifying bacteria
d) None of the above

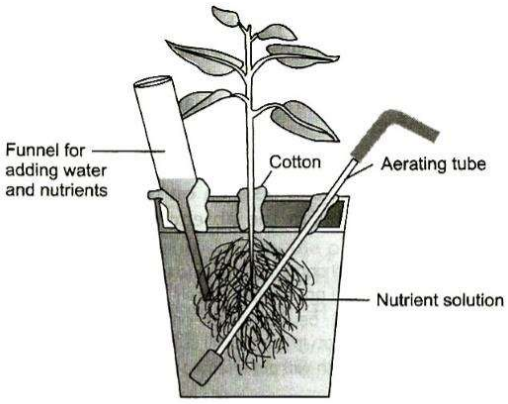
154. The appearance of yellow edges in leaves is due to the deficiency of this mineral element.
a) Calcium
b) Magnesium
c) Potassium
d) Sulphur

155. Minerals are absorbed by plants in
a) Colloidal form
b) ionic form
c) Precipitated form
d) None of these

156. Which of the following is not an insectivorous plant?
a) Drosera
b) Nepenthes
c) Monotropa
d) Utricularia

157. An element playing important role in nitrogen fixation is
a) Molybdenum b) Copper c) Manganese d) Zinc

158. What does the given experimental set-up to depicts?



Choose the correct option accordingly
a) O_2 evolves during photosynthesis b) CO_2 is required during photosynthesis
c) Measurement of the growth of a plant d) Nutrient solution culture

159. The following reaction represents

$$\alpha\text{-ketogulataric acid} + NH_4^+ + NADPH \xrightarrow[\text{dehydrogenose}]{\text{Glutamate}} \text{Glutamate} + H_2O + NADP$$

a) Reductive amination b) Transamination c) Amination d) Nitrification

160. Copper is present in
a) Plasmalemma b) Plastoquinone c) Plastocyanin d) Ferredoxin

161. Which of the following is used as an alternative for minerals?
a) Rubber b) Polythene c) Decron d) Cement

162. The function of leghaemoglobin in the root nodules of legumes is
a) Oxygen removal b) Nodule differentiation
c) Expression of *nif* gene d) Inhibibition of nitrogenase activity

163. The molecular nitrogen is correctly termed as
a) Trinitrogen b) Nitrogen c) Dinitrogen d) Nitrogen oxide

164. The deficiency of this micronutrient results in little leaf disease.
a) Copper b) Zinc c) Boron d) Iron

165. Zn, Mo, Fe, Cu are
a) Trace elements b) Non-essentials c) Macronutrients d) None of these

166. Name the technique used by researchers to explore the plant nutrient deficiencies
a) Sun exposure b) Hyperbasic chambers
c) Crop rotation d) Hydroponics

167. Bacteria and fungi developing on dead decaying organisms are
a) Parasites b) Commensals c) Saprophytes d) Symbionts

168. Name the elements, which occur in nucleic acid macromolecule?
a) C, H, O, N, S b) C, O, N, S c) C, O, P, S d) C, H, O, N, P

169. Enzymes involved in nitrogen metabolism is
a) Phosphoenol pyruvate carboxylase
b) Ribulose bisphosphate carboxylase oxygenase
c) Nitrogenase
d) Alcohol dehydrogenase

170. Select the incorrect statement
a) *Anabaena* and *Nostoc* are not capable of fixing nitrogen in free living state
b) Phosphorus is a constituent of cell membranes, certain nucleic acid and cell proteins

c) Root nodule forming nitrogen fixers live as aerobes under free-living conditions
d) *Nitrosomonas* and *Nitrobacter* are chemoautotrophs

171. Two nitrogen atoms are joined by
a) The double covalent bond
b) Ionic bond
c) The triple covalent bond
d) None of these

172. Which of the following is considered to be the best chemical method of fixing atmospheric nitrogen?
a) Fisher method
b) Decan method
c) Haber-Bosch method
d) Parnas-Meyerhoff method

173. Which of the following elements play a major role in nitrogen metabolism by activating the enzyme, nitrogenase?
a) Cu^{+2}
b) Zn^{+2}
c) Mg^{+2}
d) Mn^{+2}

174. Chlorosis is
a) Loss of chlorophyll
b) Yellowing of leaves
c) Death of blant tissue
d) Blackening of the leaves

175. Ca^{2+} is an essential elements in plants. The major function it performs is
a) Selective permeability of the cell membrane
b) Maintenance of the cell turgidity
c) Energy transfer
d) Increases hardness of the cell wall

176. On the basis of symptoms of chlorosis in leaves, a student inferred that this was due to the deficiency of nitrogen. This inference could be correct only if we assume that yellowing of leaves appeared first in
a) Old leaves
b) Young leaves
c) Young leaves followed by mature leaves
d) Young leaves followed by young leaves

177. Choose a true statement regarding essential mineral elements of plants
a) Minerals present in the soil cannot enter the plants
b) Gold is the only element which cannot be accumulated by the plants
c) Plants growing near the nuclear test sites takes up the radioactive strontium
d) Minerals present in very low concentration cannot be detected and, hence they remain undiscovered

178. The insectivorous plants are
a) Autotrophic
b) Heterotrophic
c) Both (a) and (b)
d) None of the above

179. In the initial phase of mineral absorption, ions are taken up into the ..... space of cells
a) Outer
b) Inner
c) Semiouter
d) None of these

180. Absorption of minerals takes place in the form of
a) Molecules
b) Compounds
c) Ions
d) Mixtures

181. A metal ion involved in stomatal regulation is
a) Iron
b) Potassium
c) Zinc
d) Magnesium

182. Find out odd one form the following options by considering its role in nitrogen cycle.
a) *Clostridium*
b) *Nostoc*
c) *Pseudomonas*
d) *Rhizobium*

183. While producing hydroponic plants, which of the following metal is added along with EDTA?
a) Nitrogen
b) Copper
c) Iron
d) None of these

184. Which one of the following is not a micronutrient?
a) Molybdenum
b) Magnesium
c) Zinc
d) Boron

185. About 98% of the mass of every living organism is composed of just six element including carbon, hydrogen, nitrogen, oxygen and
a) Phosphorus and sulphur
b) Sulphur and magnesium
c) Magn0esium and sodium
d) Calcium and phosphorus

186. The bladder serving as floats for trapping insects is found in
a) *Zizyphus* b) *Utricularia* c) *Nephenthes* d) *Acacia*

187. Which of the following method is close to hydroponics and has the same principle?
a) Aeroponics b) Geoponics c) Planting d) None of these

188. Plants uptake minerals present in the soil, mostly through
a) Shoot b) Photosynthesis c) Roots d) None of these

189. Boron in green plants assists in
a) Photosynthesis b) Sugar transport
c) Activation of enzymes d) Acting as enzyme cofactor

190. Separation of amino acid and carboxylic groups is called
a) Deamination b) Exertion c) Egestion d) Transamination

191. Addition of chelating agent to hydroponics is necessary for
a) Healthy plants b) Nutrition of plants
c) Promote plant growth d) All of the above

192. Which of the following mineral deficiencies will cause death of stem and root tips?
a) Mo b) Ca c) S d) Fe

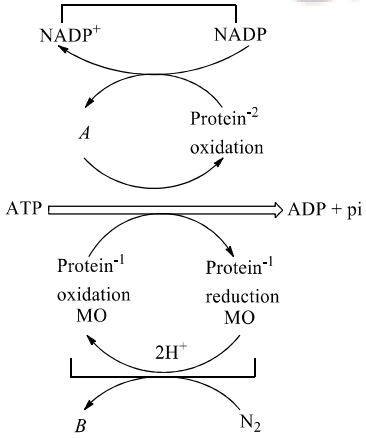
193. Which among the following is the major constituent of proteins, nucleic acids, vitamins and hormones?
a) K b) N c) P d) S

194. Which of the following is a flowering plant with nodules containing filamentous nitrogen-fixing microorganism?
a) Casuarinas equisetifolia b) Crotalaria juncea
c) Cycus revolute d) Cicer arietinum

195. 'Khaira disease of rice' is due to
a) Fungus b) Bacteria c) Zn deficiency d) Mo deficiency

196. Which one of the following is a micronutrient in plants?
a) Magnesium b) Zinc c) Potassium d) Calcium

197. The diagram represents a mechanism of symbiotic N_2-fixation. Here A and B stands for

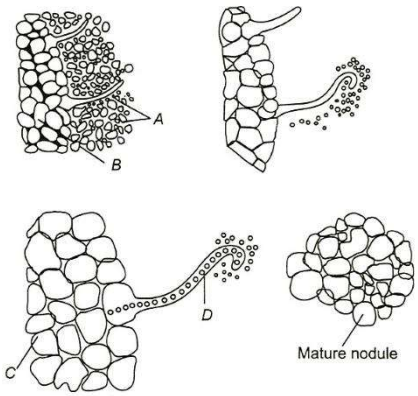


a) A-Protein^{-1} reduction; B$-2NH_3$ b) A-Protein^{-2} reduction; B$-2NH_3$
c) A-Protein^{-2} oxidation; B$-2NH_2$ d) A-Protein^{-2} reduction; B$-2N_2$

198. In which of the following conditions, plants cannot be grown?
a) Soil without microelements b) Soil without macroelements
c) Both (a) and (b) d) None of these

199. One of the major function of essential elements is
a) Activation of enzymes b) Inhibition of enzymes
c) Both (a) and (b) d) No effect on enzymes

200. Identify the A t D correctly in the given diagram of root nodule development and choose the correct option accordingly



a) A-Rhizobial bacteria, B-Cortex cell, C-Outer cortex, D-Infection thread
b) A-Rhizobial bacteria, B-Cortex cell, , C-Inner cortex, D-Infection thread
c) A-Rhizobial bacteria, B-Endodermal cell, C- Inner endodermis, D-Infection thread
d) A-*Nitrosomonas* bacteria, B-Cortex cell, C- Inner cortex, D-Infection thread

201. Efflux is the movement of ions
a) From one cell to another
b) Within the cell
c) Into the cell
d) Out of the cell

202. If by radiation all nitrogenase enzymes are inactivated, then there will be no
a) Fixation of nitrogen in legumes
b) Fixation of atmospheric nitrogen
c) Conversion from nitrate to nitrite in legumes
d) Conversion from ammonium to nitrate in soil

203. The process of conversion of nitrogen to ammonia is termed as
a) Ammonification b) Nitrification c) Denitrification d) Nitrogen fixation

204. Identify the non-leguminous plants that forms nodules to fix nitrogen
a) *Alnus* b) *Casuarina* c) *Xanthomonas* d) All of these

205. The minerals involved in water-splitting reaction during photosynthesis are
a) Magnesium and chlorine b) Potassium and manganese
c) Manganese and chlorine d) Molybdenum and manganese

206. Nitrifying bacteria
a) Convert free nitrogen to nitrogen compounds
b) Convert proteins into ammonia
c) Reduce nitrates to free nitrogen
d) Oxidize ammonia to nitrates

207. Micronutrients are
a) As important as macronutrients but are required in small amount
b) Less important than macronutrients
c) Called micro as they play only a minor role in plant nutrition
d) None of the above

208. A small aquatic plant was put in each of the petri dishes- X, Y and Z, containing different culture solutions. After six weeks, the plant in dish-X had the same number of leaves as it had previously and were all small and yellowish. Plant in dish-Y had more leaves of normal size and dark green colour. Plants in dish-Z had more leaves of normal size but very pale. Which of the following show the elements missing the culture?
a) Magnesium Phosphorus b) Phosphorus Magnesium

Nitrogen

c) Phosphorus Nitrogen Magnesium

d) Magnesium Nitrogen Phosphorus

209. Essential ions are absorbed in different amounts by
a) Root hairs b) Shoots c) Phloem d) None of these

210. Which of the following is/are not an essential micro nutrient?
a) Boron b) Nickel and cadmium
c) Molybdenum d) Zinc

211. For the existence of nitrogen, how many nitrogen atoms are required?
a) Three b) Two c) Four d) One

212. In the final phase of mineral absorption ions are taken up
a) Slowly b) Rapidly c) Very fastly d) Fluently

213. Which of the following statement is true about the passive uptake of ions?
a) Passive uptake may be non-mediated or mediated
b) Passive uptake is always mediated
c) Passive uptake is always non-mediated
d) None of the above

214. Active transport of ions by the cell requires
a) Alkaline pH b) Salts c) High temperature d) ATP

215. If the size of fruits diminishes in plants, which mineral ion should be added to soil?
a) Calcium b) Chlorine c) Copper d) Boron

216. Mineral element required by plants in the greatest amount is
a) Nitrogen b) Potassium c) Phosphorus d) Zinc

217. Premature leaf fall is due to deficiency of
a) Phosphorus b) Nitrogen c) Calcium d) Potassium

218. An element must be considered essential, when
I. the element is necessary for supporting normal growth and reproduction of the plants
II. the deficiency of that particular element can not be met by supplying some other element
III. the element is directly involved in the metabolism of the plants. Choose the correct pair
a) I and III b) Only II c) II and III d) I, II and III

219. Soilless culture helps in knowing
a) Toxicity caused by an element b) Deficiency symptoms caused by an element
c) Essentially of an element d) All of the above

220. Chlorosis is caused due to deficiency of
a) Magnesium b) Calcium c) Boron d) Manganese

221. I. The practice of growing plants in nutrient enriched water without soil is called ….
II. The system of growing plants with their roots bathed in nutrient mist (a cloud of moisture in air) is called…..
Complete the given statement (I and II) with the correct pair of options given below
a) Hydroponics and aeroponics b) Aeroponics and hydroponics
c) Hydroponics and fogponics d) Agroponics and hydroponics

222. A plant which lives on another plant but do not take food or anything from plant is called
a) Endophyte b) Epiphyte c) Parasite d) Host

223. In addition to known essential elements, there are some beneficial elements. These are required by the
a) Small plants b) Very small plants c) Higher plants d) All of the above

224. For nitrogen fixation, useful pigment is
a) Nitrogenase b) Haemoglobin c) Myoglobin d) Leghaemglobin

225. Fe can be taken by plants in the form of
a) Ferrous ion b) Ferrous sulphate c) Ferric ions d) Either (a) or (c)

226. Necrosis in crops is due to the deficiency of
a) Ca, K, S, and Mo b) N, K, S and Mo c) N, S, Fe and Zn d) Mg, S, Mn and Ca

227. Hydroponics were first time demonstrated in the year
a) 1860 b) 1866 c) 1859 d) 1886

228. Which element is located at the centre of the porphyryin ring in chlorophyll?
a) Potassium b) Manganese c) Calcium d) Magnesium

229. The structure present in cynobacteria (BGA) that helping in nitrogen fixation is
a) Haplosperm b) Holostrum c) Holotrema d) Heterocyst