Soil Science and Agricultural Chemistry

SOIL FERTILITY AND PLANT NUTRITION

1. The capability of soil to produce a plant or plant parts is called as
   a. Soil fertility b. Soil quality
   c. Soil productivity d. All…….Ans.C
2. The inherent capacity of soil to provide nutrients is called as
   a. Soil fertility b. Soil quality
   c. Soil productivity d. All…….Ans.A
3. The total number of essential nutrient elements required for plant growth is
   a. 16 b. 17
   c. 20 d. 21…….Ans.B
4. The 'Functional or metabolism nutrients' was given by
   a. Arnon and Stout b. Nicholas
   c. Mayor and Brown d. Juston von Liebig…….Ans.B
5. N, P and K are called as
   a. Macro nutrients b. Micronutrients
   c. Secondary nutrients d. Beneficial nutrients…….Ans.A
6. Ca, Mg and S are called as
   a. Macro nutrients b. Micronutrients
   c. Secondary nutrients d. Beneficial nutrients…….Ans.C
7. Iron, zinc, boron and molybdenum are called as
   a. Macro nutrients b. Micronutrients
   c. Secondary nutrients d. Beneficial nutrients…….Ans.B
8. Na, Ve, Ni, Si, Co, Se and I are the examples of
   a. Macro nutrients b. Micronutrients
   c. Secondary nutrients d. Beneficial nutrients…….Ans.D
9. The form(s) of phosphorous absorbed by plants is/are
   a. HPO_4^{3-} b. $H2PO_4^-$ c. HPO_4^{2-}
   d. Both a and b e. All…….Ans.D
10. The major portion of available boron is absorbed by plants as
    a. BO_3^{3-} b. $HB_4O_7^-$
    c. $H_2B_4O_7^-$ d. Both a and b…….Ans.B
11. Of the following, which is the available form of molybdenum to plant?
    a. $HMoO_4^-$ b. MoO_4^-
    c. $HMoO_4^{2-}$ d. MoO_4^{2-}…….Ans.A
12. Of the following, which nutrient element(s) is/are essential for protein synthesis?
    a. Nitrogen b. Phosphorous
    c. Potassium d. Ca and Mg…….Ans.A
13. _____ is a constituent of sugar phosphates, viz. ADP, ATP?
    a. Nitrogen b. Phosphorous
    c. Sulphur d. Molybdenum…….Ans.B
14. Which nutrient element is involved in energy transformation?
    a. Molybdenum b. Zinc
    c. Sulphate d. Phosphorous…….Ans.D

15. The nutrient element(s) involved in stomatal regulation of cell is/are
    a. Ca and Mg b. Nitrogen
    c. Potassium d. Both a and c…….Ans.C
16. The nutrient element(s) essential for maintenance of the stability of cell wall is/are
    a. Phosphorous b. Calcium
    c. Magnesium d. Potassium…….Ans.B
17. Oil content in oil-bearing plants is increased by
    a. Sulphur b. Molybdenum
    c. Nitrogen d. phosphorous…….Ans.A
18. Of the following, which nutrient element(s) is/are responsible for the translocation of sugars across the membrane?
    a. Boron b. Phsophorus and Zinc
    c. Molydenum and Iron d. All…….Ans. A
19. Nutrient element(s) essential for photosynthesis is/are
    a. Manganese b. Copper and Zinc
    c. Phosphorus d. All…….Ans. A
20. Nutrient element(s) essential for the functioning of sulphydryl compounds such as cysteine is/are
    a. Sulphur b. Zinc
    c. Phosphorous d. Both a and b…….Ans.B
21. Which nutrient is a constituent of nitrate reductase and nitrogenase enzymes?
    a. Molybdenum b. Zinc
    c. Copper d. Phosphorous…….Ans.A
22. Nutrient element(s) essential for carbohydrates metabolism is/are a.

23. Nutrient element(s) essential for protein synthesis is/are

24. Which nutrient is a constituent of chlorophyll and chromosomes?
    a. Magnesium b. Iron
    c. Phosphorous d. Both a and b…….Ans.A
25. Movement of nutrient ions form soil to plant roots by
    a. Diffusion b. Mass flow
    c. Contact exchange d. All…….Ans. D
26. Movement of nutrient ions along with irrigation water or rainwater is called as
    a. Diffusion b. Mass flow
    c. Contact exchange d. All…….Ans. B
27. Movement of nutrient ions through irrigation water or rainwater is called as
    a. Diffusion b. Mass flow
    c. Contact exchange d. All…….Ans. A
28. What is the mineralization rate of organic nitrogen per year?
    a. 1.5 % b. 2.0 %
    c. 2.5 % d. 1.0 %…….Ans. C
29. Alkaline permanganate method is used for the estimation of
    a. Total nitrogen b. Available nitrogen
    c. Nitrate nitrogen d. Ammonical nitrogen…….Ans. B

30. The analytical method most suitable for the estimation of available phosphorous in acid soils is
    a. Olsen's method b. Mehlich's method
    c. Bray and Kurtz's method d. All…….Ans.C
31. The analytical method most suitable for the estimation of available phosphorous in all the soils except acid soils is
    a. Olsen's method b. Bray and Kurtz's I method
    c. Bray and Kurtz's II method d. Both b and c…….Ans.A
32. What is the composition of Bray and Kurtz's No. 1 solution used for the estimation of available phosphorous?
    a. 0.03 N Na_4F + 0.025 N HCl b. 0.03 N NH_4F + 0.025 N HCl
    c. 0.03 N Na_4F + 0.25 N HCl d. 0.03 N NH_4F + 0.25 N HCl…….Ans. B
33. Which extractant used in Olsen's method for the estimation of available phosphorous in neutral and alkaline soils?
    a. 1% K_2CO_3 b. 1.0% citric acid
    c. 0.5 M NH_4HCO_3 d. 0.5 M $NaHCO_3$…….Ans.D
34. The extractant commonly used in the estimation of phosphate potential of soils is
    a. a. 1% K_2CO_3 b. 1.0% citric acid
    c. 0.01M $CaCl_2$ d. 0.1M $CaCl_2$…….Ans.C
35. Available sulphur in soils can be extracted by
    a. 1% NaCl b. $Ca(H_2PO_4)_2$
    c. 0.15% $CaCl_2$ d. All…….Ans. D
36. Diethylene triamine penta acetic acid (DTPA) is used for the eatimation of available
    a. N, P and K b. Ca, Mg and S
    c. Fe, Mn, Zn and Cu d. Cu, Mn, Fe, Zn, B, Mo and Cl….Ans.C
37. Available molybdenum in soils is extracted by
    a. Citric acid b. Ammonium acetate
    c. Hot water d. $CaCl_2$…….Ans.B
38. The pH of the solution (0.5M $NaHCO_3$) used in Olsen's method of available phosphorous estimation should be adjusted to
    a. 8.5 b. 8.0
    c. 8.3 d. 7.0…….Ans.A
39. What is the optimum pH for the availability of most of the plant nutrients?
    a. 5.0 – 6.0 b. 6.0 – 7.0
    c. 6.5 – 7.5 d. 6.0 – 8.0…….Ans.C
40. In soil, ammonifiers and nitrifiers are active at the pH of
    a. 5.0 – 6.0 b. 6.0 – 7.0
    c. 6.5 – 7.5 d. 5.5 – 6.0…….Ans.D
41. In soil, the availability of phosphate ions to plants is considered to follow the order of
    a. $PO_4^{3-} > HPO_4^{2-} > H_2PO_4^-$
    b. $H_2PO_4^- > HPO_4^{2-} > PO_4^{3-}$
    c. $H_2PO_4^- > HPO_4^{2-} > H_3PO_4$
    d. $HPO_4^{2-} > H_2PO_4 > PO_4^{3-}$…….Ans. B

42. Precipitation of phosphate ions in solution by hydrated iron takes place in the pH range of
    a. 3.0 – 7.0 b. 2.0 – 6.0
    c. 3.5 – 9.0 d. 3.0 – 8.0…….Ans. A
43. Precipitation of phosphate ions in solution by hydrated aluminium takes place in the pH range of
    a. 3.0 – 7.0 b. 2.0 – 6.0
    c. 3.5 – 9.0 d. 3.0 – 8.0…….Ans. C
44. Increase in soil water content and soil temperature, increases the availability of
    a. Nitrogen b. Phosphorous
    c. Potassium d. All…….Ans. B
45. The availability of calcium and magnesium in soil is low above the pH of
    a. 7.5 b. 8.5
    c. 9.5 d. 8.0…….Ans. B
46. The availability of boron in soil is more in the pH range of
    a. 5.0-7.0 and > 8.5 b. 5.0 – 8.5
    c. 6.5 – 7.0 and > 8.5 d. 6.5 – 7.0 and > 9.0…….Ans. A
47. The availability of molybdenum in soil is more in the pH of
    a. > 6.5 b. > 7.5
    c. > 8.5 d. > 8.0…….Ans. A
48. The Law of Diminishing Return was given by
    a. Juston von Leibig b. Spillman
    c. Mitcherlich d. -------…….Ans. C
49. The Law of Restitution was given by
    a. Juston von Leibig b. Spillman
    c. Mitcherlich d. Thomas Way…….Ans.A
50. The Law of Minimum was given by
    a. Juston von Leibig b. Spillman
    c. Mitcherlich d. Thomas Way…….Ans.A
51. The equation, $\log (A - y) = \log A - Cx$ is called as
    a. Spillman's equation b. Mitcherlich's equation
    c. Leibig equation d. Gapon's equation…….Ans.B
52. The equation, $y = M (1 - R^x)$ is called as
    a. Mitcherlich's equation b. Leibig equation
    c. Spillman's equation d. Gapon's equation…….Ans.C
53. Nutrient mobility concept was given by
    a. Cate and Nelson b. Arnon and Stout
    c. Larsen d. Bray…….Ans. D
54. Example(s) for Bray's relatively immobile nutrients is/are
    a. Phosphorous b. Potassium
    c. Calcium d. All…….Ans.D
55. Example(s) for Bray's mobile nutrients is/are
    a. Phosphorous b. NO_3 – nitrogen
    c. Potassium d. Calcium…….Ans.C

56. Bray's mobile nutrients follow the
    a. Law of minimum or Law of limiting nutrients
    b. Baule and Mitcherlich concepts
    c. Law of minimum and Mitcherlich concepts
    d. Law of minimum and Baule concepts…….Ans.A
57. Bray's relatively immobile nutrients follow the
    a. Law of minimum or Law of limiting nutrients
    b. Baule and Mitcherlich concepts
    c. Law of minimum and Mitcherlich concepts
    d. Law of minimum and Baule concepts…….Ans.B
58. Example(s) of direct biological methods used for the diagnosis of soil nutrient status is/are
    a. Field trial b. Pot culture
    c. Neubauer seedling method d. All…….Ans.A
59. Nutrient diagnosis in soil by pot culture methods were first initiated by
    a. Bousingault b. Mitcherlich
    c. Neubauer d. Mehlich…….Ans.B
60. Nutrient diagnosis in soil by *Aspergillus niger* methods were first used by
    a. Bousingault b. Mitcherlich
    c. Neubauer d. Mehlich…….Ans.D
61. Nutrient diagnosis in soil by soil plague method was first used by
    a. Bousingault b. Mitcherlich
    c. Sackett and Stewart d. Mehlich…….Ans.C
62. The range of concentration at which growth of plants is restricted in comparison with that of plant at higher nutrient level is called as
    a. Hidden hunger b. Critical nutrient level
    c. Limiting factor d. All…….Ans.B
63. In A – value [A/B = (1- y)/y], B denotes
    a. Available phosphorous b. Fertilizer phosphorous
    c. Phosphorous derived from soil d. Both b and c…….Ans.B
64. Bray and Kurtz's method of phosphorous determination is used for the soils having pH of
    a. 5.5 and below b. 6.0 and below
    c. 6.5 and below d. 5.0 and below…….Ans.A
65. What is the concentration of DTPA used for the extraction of micronutrients in soil?
    a. 0.5 M b. 0.05 M
    c. 0.005 M d. 0.025 M……..Ans. C
66. In soil micronutrient extraction, the pH of 0.005M DTPA is adjusted to
    a. 7.5 b. 8.3
    c. 8.5 d. 7.3…….Ans.D
67. Common method(s) used for the determination of gypsum requirement of sodic soils
    a. Shofield's method b. Schoonover's method
    c. Sokonov's method d. All…….Ans.B
68. Critical soil test level approach was given by
    a. Cate and Nelson b. Arnon and Stout
    c. Larsen d. Bray…….Ans. A

69. Total number of classes in nutrient index is
    a. Three b. Four
    c. Five d. Six…….Ans.A
70. What is the value of low nutrient index (NI)?
    a. < 0.5 b. < 1.0
    c. < 1.5 d. < 2.0…….Ans.C
71. What is the value of high nutrient index (NI)?
    a. > 4.5 b. > 3.5
    c. > 2.5 d. > 3.0…….Ans.C
72. First permanent manural experiment in India was started at
    a. Coimbatore b. Kanpur
    c. Pusa (Bihar) d. All…….Ans. B
73. Manures with decreasing order of agriculture importance
    a. Green manures> Crop wastes> Poultry litter> Cattle shed waste
    b. Poultry litter> Cattle shed waste> Crop wastes> Green manures
    c. Cattle shed waste> Poultry litter> Green manures> Crop wastes
    d. Cattle shed waste> Poultry litter> Crop wastes> Green manures…….Ans.D
74. What is the percentage of nitrogen in cattle dung?
    a. 0.1 b. 0.2
    c. 0.3 d. 0.5…….Ans.C
75. What is the percentage of organic matter content in cattle waste?
    a. 12.5 % b. 14 %
    c. 15.2 % d. 31.1 %…….Ans.C
76. What is the N, P_2O_5 and K_2O content (%) in FYM?
    a. 1.0: 0.5: 1.5 b. 0.5: 0.3: 0.5
    c. 0.5: 0.5: 1.0 d. 1.5: 0.5: 0.5…….Ans.B
77. What is the N, P_2O_5 and K_2O content (%) in cow dung?
    a. 1.0: 0.5: 1.5 b. 0.5: 0.3: 0.5
    c. 0.5: 0.5: 1.0 d. 1.5: 0.5: 0.5…….Ans.D
78. What is the N, P_2O_5 and K_2O content (%) in cow dung slurry from biogas plant?
    a. 2.5: 1.5: 1.5 b. 1.8: 1.0: 1.0
    c. 5.0: 3.0:2.0 d. 0.5: 0.5: 1.0…….Ans.B
79. What is the percentage of nitrogen content in green manures?
    a. 0.7 b. 0.5
    c. 1.2 d. 1.5…….Ans. A
80. Which of the following is an example for edible oil cake?
    a. Caster cake b. Karanji cake
    c. Mahua cake d. Mustard cake…….Ans.D
81. Which of the following is an example for non- edible oil cake?
    a. Groundnut oil cake b. Niger cake
    c. Neem cake d. Sesame cake…….Ans.C
82. What is the percentage of P_2O_5 in bone meal?
    a. 10 b. 20
    c. 15 d. 5…….Ans.B

83. Fish meal contains more _____.
a. Nitrogen b. Phosphorous
c. Potassium d. Ca and Mg…….Ans. A
84. Which fertilizer is added to prevent nitrogen losses during the decomposition of organic matter?
a. Rock phosphate b. Single super phosphate
c. Murate of potash d. Lime…….Ans.B
85. What is the percentage of methane produced from biogas plant?
a. 50 – 60 b. 40 – 50
c. 60 – 70 d. 30 – 40 A
86. Which organism is responsible for the production of methane from the biogas plant?
a. Bacillus b. Pseudomonas
c. Arthrobacter d. Methenobactrria…….Ans.D
87. Microbes belonging to the family methanobacteria are
a. Aerobes b. Anaerobes
c. Facultative aerobes d. Facultative anaerobes…….Ans.B
88. Which fertilizers enhance the manuring properties of legumes?
a. Nitrogenous fertilizers b. Phosphatic fertilizers
c. Potassic fertilizers d. All…….Ans.B
89. Of the following, which one is concentrated organic manures?
a. FYM b. Compost
c. Bone meal d. Poultry litters…….Ans.C
90. Of the following, which one is bulky organic manure?
a. Composts b. Oil cakes
c. Bone meals d. Fishmeals…….Ans.A
91. When a fertilizer contains and is used for supplying single nutrient, it is called as
a. Straight fertilizers b. Mixed fertilizers
c. Complex fertilizers d. Compound fertilizers…….Ans.A
92. The presence of two or more nutrients in one compound or mixture is called as
a. Complex fertilizers b. Compound fertilizers
c. Mixed fertilizers d. Both a and b…….Ans.D
93. The physical mixture of two or more straight fertilizers or compound fertilizers is called as
a. Straight fertilizers b. Complex fertilizers
c. Mixed fertilizers d. Compound fertilizers…….Ans.C
94. What is the percentage of nitrogen in urea?
a. 48 b. 46
c. 25 d. 42…….Ans.B
95. What is the percentage of nitrogen in ammonium sulphate?
a. 20.6 b. 26.0
c. 25.0 d. 46.0…….Ans.A
96. What is the percentage of nitrogen in ammonium chloride?
a. 20.6 b. 26.0
c. 25.0 d. 46.0…….Ans.C

97. What is the percentage of P_2O_5 in single super phosphate?
a. 16.0 b. 46.0
c. 34.0 d. 28.0…….Ans.A
98. What is the percentage of P_2O_5 in diammonium phosphate (DAP)?
a. 16.0 b. 48.0
c. 34.0 d. 46.0…….Ans.D
99. The percentage of K_2O in muriate of potash (MOP) is
a. 58.0 b. 48.0
c. 23.0 d. 15.0…….Ans.A
100. The percentage of K_2O in sulphate of potash (MOP) is
a. 58.0 b. 48.0
c. 23.0 d. 15.0…….Ans.B
101. Muriate of potash is a
a. Straight fertilizer b. Compound fertilizer
c. Mixed fertilizer d. Complex fertilizer…….Ans.A
102. Diammonium phosphate (DAP) is a
a. Compound or complex fertilizer b. Mixed fertilizer
c. Straight fertilizer d. Complete complex fertilizer…….Ans.A
103. Which form of nitrogen is present in urea?
a. Nitrate form b. Ammonical form
c. Amide form d. Both a and b…….Ans.C
104. The most deficient nutrient in Indian soils is
a. Nitrogen b. Zinc
c. Copper d. Boron…….Ans. A
105. The second most deficient nutrient in Indian soils after nitrogen is
a. Nitrogen b. Zinc
c. Copper d. Boron…….Ans. B
106. What is the temperature maintained in ammonia production by Claude-Haber-Bosch synthesis process?
a. 400-500 ^oC b. 500-600 ^oC
c. 550-600 ^oC d. 600-650 ^oC…….Ans.A
107. By-product of coal distillation
a. Ammonium chloride b. Ammonium nitrate
c. Ammonium sulphate d. CAN…….Ans. C
108. Fertilizer that supplies both nitrogen and sulphur is
a. Urea b. Ammonium sulphate
c. Ammonium chloride d. CAN …….Ans. B
109. Equivalent acidity of ammonium sulphate is
a. 80 b. 60
c. 100 d. 110…….Ans.D
110. Equivalent acidity of calcium ammonium nitrate (CAN) is
a. 80 b. 60
c. 100 d. 110…….Ans.B

111. Equivalent acidity of urea is
a. 80 b. 60
c. 100 d. 110…….Ans.A
112. Highly hygroscopic fertilizer is
a. Ammonium chloride b. Ammonium sulphate
c. Urea d. CAN…….Ans.B
113. Urea is hydrolyzed by which of the following enzymes?
a. Nitrogenase b. Urease
c. Hydrogenase d. Both a and c…….Ans.B
114. The first unstable compound produced by the hydrolysis of urea is
a. Ammonium carbomate b. Ammonium carbonate
c. Ammonium d. Nitrate…….Ans.A
115. The ideal nitrogenous fertilizer suitable for foliar application is
a. Ammonium nitrate b. Ammonium chloride
c. Ammonium sulphate d. Urea…….Ans.D
116. _____ is also called as Nitro-lime or Nitro-chalk.
a. Ammonium nitrate b. Calcium ammoinium nitrate
c. Ammonium sulphate d. Ammonium chloride…….Ans.B
117. Nitrogen percentage in calcium ammonium nitrate (CAN) is _____.
a. 20.6 b. 46.0
c. 25.0 d. 26.0…….Ans.C
118. Fertilizer that supplies nitrogen in both ammonical and nitrate forms is _____.
a. Calcium ammonium nitrate (CAN) b. Urea
c. Ammonium sulphate d. Ammonium chloride…….Ans.A
119. _____ is an example for explosive fertilizer.
a. Ammonium chloride b. Ammonium sulphate
c. Ammonium nitrate d. CAN…….Ans.C
120. Fertilizer that is a by-product of soda ash manufacture is _____.
a. Ammonium chloride b. Ammonium sulphate
c. Ammonium nitrate d. CAN…….Ans. A
121. What is the formula of dicalcium phosphate?
a. $Ca(H_2PO_4)_2$ b. $CaHPO_4$
c. Ca_2HPO_4 d. $Ca_3(PO_4)_2$…….Ans.B
122. Example for straight, water soluble phosphatic fertilizer is
a. Monocalcium phosphate b. Dicalcium phosphate
c. Tricalcium phosphate d. Diammonium phosphate…….Ans.A
123. Example(s) for citrate soluble phosphatic fertilizers is/are
a. Basic slag and pelophos b. Bone meal
c. Dicalcium phosphate d. All…….Ans.D
124. Phsophatic fertilizer that supplies both phosphorous and sulphur is
a. Dicalcium phosphate b. Single super phosphate
c. Tricalcium phosphate d. Diammonium phosphate…….Ans.B
125. Most popular phosphatic fertilizer in India is
a. Single super phosphate b. Double super phosphate
c. Rock phosphate d. Diammonium phosphate…….Ans.A

126. The impurities present in single super phosphate or rock phosphate are
a. Cu and Zn b. Mn and Cu
c. Mn and Fe d. Cu and Fe…….Ans.C
127. The phosphatic fertilizer most suitable for all the crops on neutral and alkaline soils is
a. Rock phosphate b. Single super phosphate
c. Double super phosphate d. Diammonium phosphate…….Ans.B
128. Phosphatic fertilizer(s) suitable for acid soils is/are
a. Rock phosphate b. Dicalcium phosphate
c. Basic slag d. All…….Ans. D
129. Phosphatic fertilizer obtained from steel industry as a by-product is
a. Dicalcium phosphate b. Schoenite
c. Basic slag d. Pelophos…….Ans. C
130. Which phosphatic fertilizer is the double silicate and phosphate of lime?
a. Pelophos b. Basic slag
c. Schoenite d. Rock phosphate…….Ans. B
131. What is the percentage of P_2O_5 in Indian basic slag?
a. 3 – 8 % b. 20 – 25 %
c. 10 - 12 % d. 12 – 18 % …….Ans. A
132. The phosphatic fertilizer most suitable for plantation and perennial crops is
a. Single super phosphate b. Dicalcium phosphate
c. Diammonium phosphate d. Rock phosphate…….Ans.D
133. Potassic fertilizer(s) most suitable for potato and tobacco is/are
a. Muriate of potash b. Sulphate of potash
c. Schoenite d. All…….Ans.B
134. Filler material(s) used in the preparation of mixed fertilizers is/are
a. Sand b. Soil
c. Coal d. All…….Ans.D
135. With increase in light intensity and day length, the fertilizer requirement of crops is
a. Increased b. Decreased
c. Unaltered d. None…….Ans. A
136. What is the nitrogen use efficiency for rice crop?
a. 40 – 60% b. 28 – 34%
c. 35 – 43% d. 42– 50% …….Ans.B
137. What is the nitrogen use efficiency for crops other than rice?
a. 28 – 34 % b. 35 – 43 %
c. 40 – 60 % d. 42– 50 % …….Ans.C
138. What is the ratio of urea and soil in pellets made by mixing urea with soil?
a. 1: 4 b. 1: 6
c. 1: 8 d. 1: 5…….Ans.B
139. Which is a slow release nitrogenous fertilizer?
a. Oxamide b. N-serve
c. AM d. ST…….Ans.A
140. Which of the following is a nitrification inhibitor?
a. U-form b. IBDU
c. SCU d. ST…….Ans.D

141. Which of the following is/are slow release nitrogenous fertilizers?
a. Urea-form b. Isobutyledene diurea
c. Sulphur coated urea d. All…….Ans.D
142. Which of the following is/are nitrification inhibitors?
a. N-serve b. AM
c. ST d. All…….Ans.D
143. Plant product used for the preparation of slow release fertilizer and also as nitrification inhibitors is
a. Neem and karanji cake b. Neem and sal cake
c. Karanji and sal cake d. Neem…….Ans.D
144. N-serve is also called as
a. Sulphonylamide b. Nitrapyrin
c. U-formaldehyde d. Both a and b…….Ans.B
145. Net mineralization will take place when the phosphorous concentration in organic matter is
a. Less than 0.2 % b. Less than 0.5 %
c. Greater than 0.2 % d. Greater than 0.5 %…….Ans.C
146. Net immobilization will take place when the phosphorous concentration in organic matter is
a. Less than 0.2 % b. Less than 0.5 %
c. Greater than 0.2 % d. Greater than 0.5 %…….Ans.A
147. Sources of hydrogen ions in soils are
a. Carbonic acids b. Acids from biological metabolism
c. Accumulation of organic matter d. All------ans.4
148. Sources of hydrogen ions in soils are
a. Oxidation of N b. Oxidation from S
c. Plant residues d. All------ans.4
149. Sources of hydrogen ions in soils are
a. Acids in precipitation b. Plant uptake of cation
c. Both d. None------ans.3
150. Uptake of nitrate by plants will lead to more
a. Production of hydrogen ions b. Consumption of hydrogen ions
c. Both d. None------ans.2
151. Weathering of basic cations from minerals will lead to more
a. Production of hydrogen ions b. Consumption of hydrogen ions
c. Both d. None------ans.2
152. Principal of soil acidity includes
a. Active acidity b. Residual acidity
c. Exchangeable acidity d. All------ans.4
153. Percent base saturation is also known as
a. Acidity b. acid saturation
c. Non acid saturation d. None------ans.3
154. What is the total nitrogen percentage in plant?
a. 6.0% b. 1.5%
c. 1.0% d. 0.5%…....Ans. B

155. What is the total sulphur percentage in plant?

a. 1.0% b. 0.5%

c. 0.2% d. 0.1%…....Ans. D

156. Match the following

Nutrient element	Concentration in plants (%)
1. N	i. 1.0
2. P or Mg	ii. 0.5
3. K	iii.1.5
4. Ca	iv. 0.1
5. S	v. 0.2

a. i, ii, iii, iv, v b. i, iii, ii, iv, v

c. iii, v, i, ii, iv d. ii, i, iii, v, iv…....Ans. C

157. Match the following

Nutrient element	Concentration in plants (ppm)
1. Fe or Cl	i. 0.1
2. Mn	ii. 50
3. Zn or B	iii.100
4. Cu	iv. 20
5. Mo	v. 6

a. i, ii, iii, iv, v b. ii, iii, i, iv, v

c. ii, i, iii, v, iv d. iii, v, iv, i, ii…....Ans. A

158. Highly resistant organic compound is

a. Inositol phosphate b. Nucleic acid

c. Phytin d. Phospho-lipids…....Ans. C

159. Which is/are the most frequently deficient nutrient(s) in soil?

a. Nitrogen b. Zinc c. Boron

d. Copper e. All…....Ans. A

160. Which is/are the most frequently deficient nutrient(s) in soil next to nitrogen?

a. Nitrogen b. Zinc c. Boron

d. Copper e. All…....Ans. B

161. Which are the deficient nutrients in Indian soil?

a. Nitrogen and Zinc b. Nitrogen and Copper

c. Boron and Copper d. All…....Ans. C

162. Nitrate to nitrite formation (nitrate reduction) takes place in

a. Cell wall b. Chloroplast

c. Cytoplasm d. Mitochondria…....Ans. C

163. Nitrite to ammonia formation (nitrite reduction) takes place in

a. Cell wall b. Chloroplast

c. Cytoplasm d. Mitochondria…....Ans. B

164. When ATP and ADP breakdown, the amount of energy released is

a. 10 kcal/mol b. 12 kcal/mol

c. 78 kcal/mol d. 786 kcal/mol…....Ans.B

165. What is the percentage of magnesium in plant chlorophyll?

a. 5 – 10 b. 10 – 15

c. 15 – 20 d. 20 – 25…....Ans.C

166. The ratio of protein to non-protein nitrogen is decreased by
a. P deficiency b. S deficiency c. Fe deficiency
d. Mg deficiency e. Both a and b…....Ans. E
167. Which of the following nutrient element is essential for the formation of vitamin-B1 (Thiamine)?
a. N b. P
c. Mg d. S…....Ans. D
168. Blossom end rot in tomato is caused by the deficiency of
a. Ca b. Mg
c. Mo d. B…....Ans. A
169. Bitter pit in apple is caused by the deficiency of
a. Ca b. Mg
c. Mo d. B…....Ans. A
170. The nutrient element that plays an important role in structural stability of proteins is
a. P b. S
c. Fe d. Mn…....Ans. B
171. Which of the following is a precursor of photorespiration in plant?
a. Phosphoglycolate b. Acetyl co-enzyme A
c. Citric acid d. Glycolate…....Ans.A
172. What is the percentage of nitrogen use efficiency for rice crop?
a. 20 – 28% b. 28 – 34%
c. 35 – 45% d. 40 – 60%…....Ans.B
173. What is the percentage of nitrogen use efficiency for other crops?
a. 20 – 28% b. 28 – 34%
c. 35 – 45% d. 40 – 60%…....Ans.D
174. What is the percentage of phosphorus use efficiency in soil?
a. 10 – 30% b. 20 – 30%
c. 25 – 45 % d. 20 – 25%…....Ans.A
175. Lime requirement is calculated by
a. Shoemaker et al b. Schoonover
c. Chepil and Woodruf d. White and Beckett….Ans. A
176. Latice hole theory was given by
a. White and Beckett b. Thomas Way
c. Page & Barer (1940) d. Mitcherlich.....Ans. c
177. The law of minimum was given by Liebig in the year
a. 1909 b. 1862
c. 1961 d. 1940 Ans. b
178. Essentiality of chlorine for plants was given by
a. Nicholas (1961) b. Arnon and Stout
c. Cate and Nelson d. Broyer et al. (1954) Ans. d
179. The Ca: Mg ratio of soil should be
a. < 7 : 1 b. < 5 : 1
c. < 7 : 1 d. < 5 : 1 Ans. a
180. For field crops, K: Mg ratio should be
a. < 2 : 1 b. < 5 : 1
c. < 3 : 1 d. < 4 : 1 Ans. b

181. For vegetables, K: Mg ratio should be
a. < 2 : 1 b. < 5 : 1
c. < 3 : 1 d. < 4 : 1 Ans. c

182. For fruits, K: Mg ratio should be
a. < 2 : 1 b. < 5 : 1
c. < 3 : 1 d. < 4 : 1 Ans. a

183. What is the ideal pH range for rice crop?
a. 5.5-7.0 b. 5.0-6.5
c. 6.5-8.0 d. 4-6.5 Ans. d

184. What is the ideal pH range for Maize, Cowpea & Groundnut?
a. 5.5-7.0 b. 5.0-6.5
c. 6.5-8.0 d. 4-6.5 Ans. b

185. Hydrolysis of Al $(OH)^{+}$ ion occurs in the pH range of
a. Less than 4.7 b. 4.7-6.5
c. 6.5-8.0 d. 8.0-11.0 Ans. c

186. At the pH range of 2-5, phosphorous is mainly fixed by
a. Fe & Al b. clay
c. Ca & Mg d. organic matter e. All Ans. a

187. What is the ideal pH range for soybean & peas?
a. 5.5-7.0 b. 5.0-6.5
c. 6.5-8.0 d. 4-6.5 Ans. a

188. What is the ideal pH range for wheat, barley, sugarcane, sunflower & sorghum?
a. 6 – 7.5 b. 5.0 – 5.5
c. 4 – 6.5 d. 6.5 – 8.0 Ans. a

189. What is the ideal pH range for sugar beet?
a. 6 – 7.5 b. 5.0 – 5.5
c. 4 – 6.5 d. 6.5 – 8.0 Ans. d

190. What is the ideal pH range for cotton & potato?
a. 6 – 7.5 b. 5.0 – 5.5
c. 4 – 6.5 d. 6.5 – 8.0 Ans. b

191. Who was the first scientist to quantify the relationship between plant growth and addition of a growth factor?
a. Liebig b. Spillman
c. Bray d. Mitcherlich Ans. d

192. $Y=M (1–R^{x})$ is called as
a. Liebig b. Spillman
c. Bray d. Mitcherlich Ans. b

193. In Mitcherlish equation, log (A–Y) = log A – Cx, the efficiency factor ‘C’ for nitrogen is
a. 0.122 b. 1.22
c. 0.831 d. 0.642 Ans. a

194. In Mitcherlish equation, log (A–Y) = log A – Cx, the efficiency factor ‘C’ for phosphorus is
a. 0.40 b. 0.60
c. 0.80 d. 1.00 Ans. b

195. In Mitcherlish equation, log (A–Y) = log A – Cx, the efficiency factor 'C' for potassium is

a. 0.40 b. 0.60
c. 0.80 d. 1.00 Ans. a

196. One Baule unit for nitrogen is

a. 250 lbs b. 241 lbs
c. 148 lbs d. 223 lbs Ans. d

197. One Baule unit for phosphorus is

a. 35 lbs b. 45 lbs
c. 48 lbs d. 38 lbs Ans. b

198. One Baule unit for potassium is

a. 66 lbs b. 76 lbs
c. 86 lbs d. 93 lbs Ans. b

199. Which are the nutrient elements involved in the electron transport in plant system?

a. Na, Cl, Mn, k b. P,B,Si,ca
c. Cu,Fe,Zn,Mo d. All Ans. c

200. In active transport of nutrient in plant system, the carrier for cation is

a. Protein b. Nucleic acid
c. Cell mitochondria d. All Ans. b

201. In active transport of nutrient in plant system, the carrier for anions is

a. Protein b. Nucleic acid
c. Cell mitochondria d. All Ans. a

202. In submerged rice soil, increase in zinc concentration will_____.

a. Increase the availability of Fe and decrease the availability of Mn
b. Increase the availability of both Fe and Mn
c. Decrease the availability of both Fe and Mn
d. Decrease the availability of Fe & Increase the availability of Mn Ans. d

203. In wheat cultivation, increases in concentration of Zn will _____.

a. Increase the availability of Cu b. Decrease the availability of Cu
c. Not change the availability of Cu d. None Ans. b

204. With regard to chelation, the metals that are essential but not bound in co-ordinate linkage with chelates are

a. Cu, Zn, Mn, Co & Mo b. Cd, Pb, Hg
c. Monovalent cations and Ca^{2+}, Mg^{2+} d. Cr, Au, Ve
e. Cl, Pb, Hg, Cr, Au, Ve Ans. c

205. With regard to chelation, the metals that are essential and form co-ordinate linkage with organic legends are

a. Cu, Zn, Mn, Co & Mo b. Cd, Pb, Hg
c. Monovalent cations and Ca^{2+}, Mg^{2+} d. Cr, Au, Ve
e. Cl, Pb, Hg, Cr, Au, Ve Ans. a

206. Arrange the metals based on their stability of metal chelatic complex.

a. $Cu^{2+} > Ni^{2+} > Co^{2+} > Zn^{2+} > Fe^{2+} > Mn^{2+}$
b. $Mn^{2+} > Fe^{2+} > Zn^{2+} > Co^{2+} > Ni^{2+} > Cu^{2+}$
c. $Cu^{2+} > Mn^{2+} > Co^{2+} > Ni^{2+} > Fe^{2+} > Zn^{2+}$
d. $Zn^{2+} > Fe^{2+} > Ni^{2+} > Co^{2+} > Mn^{2+} > Cu^{2+}$ Ans. a

207. Examples of natural chelates are
a. Citric acid & oxalic b. EDTA & DTPA
c. Citric acid & oxalic & HEDTA d. EDTA , DTPA & HEDTA Ans. a
208. Examples of artificial chelates are
a. Citric acid & oxalic b. EDTA & DTPA
c. Citric acid & oxalic & HEDTA d. EDTA , DTPA & HEDTA Ans. d
209. How many number of ATP molecules are required for the reduction of one mole of NO_3 to NH_3?
a. 12 b. 15
c. 18 d. 21 Ans. b
210. How many number of ATP molecules are required for assimilation of one mole NH_3?
a. 5 b. 10
c. 15 d. 18 Ans. a
211. Calicoles plants prefer
a. NO_3-N b. NH_4 – N
c. Both a & b d. None Ans. a
212. Crude protein = Total N x _____
a. 5.5 – 6.25 b. 5.0 – 6.25
c. 5.7 – 6.25 d. 5.9 – 6.25 Ans. c
213. What is the percentage of phospholipids in total organic phosphorous?
a. 35 b. 2.5
c. 1 – 5 d. 18 – 20 Ans. c
214. The pH at which the concentration of both $H_2PO_4^-$ & HPO_4^{2-} becomes equal is
a. 7.2 b. 7.0
c. 6.5 d. 7.5 Ans. a
215. Nutrient element mainly involved in the stomatal regulation is/are
a. Ca b. Mg c. Na
d. K e. Both a & b Ans. d
216. Nutrient element mainly involved in the photosynthesis & translocation of photosynthates is/are
a. Ca b. Mg c. Na
d. K e. Both a & b Ans. d
217. Nutrient element mainly involved in the phloem loading & unloading is/are
a. Ca & Mg b. Na
c. K d. All Ans. c
218. Larger amount of K^+ is replaced by Na^+ in
a. Sugar beet, Turnip & Grasses
b. Wheat, Pea, Cotton, Cabbage & Radish
c. Oat, Barley, Rice, Tomato & Potato
d. Maize, Dye, Soybean & Beans Ans. a
219. Small amount of K^+ is replaced by Na^+ in
a. Sugar beet, Turnip & Grasses
b. Wheat, Pea, Cotton, Cabbage & Radish
c. Oat, Barley, Rice, Tomato & Potato
d. Maize, Dye, Soybean & Beans Ans. d

220. Synthetic Mg-chelates contain _____ % of Mg.
a. 8– 9 b. 2 – 4
c. 4 – 9 d. 16 – 19 Ans. b
221. Natural Mg-chelates contain _____ % of Mg.
a. 8– 9 b. 2 – 4
c. 4 – 9 d. 16 – 19 Ans. c
222. Sulphate has positive interaction with nitrogen & phosphorous. (True/False) Ans. T
223. Sulphate has positive interaction with Mo, B, & Se (True/False). Ans. F
224. The method used to measure a nutrient concentration in soil at equilibrium with the same in soil solution is
a. E-value b. A-value
c. L-value d._____ Ans. a
225. In biological methods of soil fertility evaluation, the *Aspeigillus Niger* (Mulder) method is used to measure the availability of
a. Available K_2O b. Available P_2O_5
c. Cu & Mg d. N, P & K Ans. c
226. In biological methods of soil fertility evaluation, the pot culture (Mitcherlitch) method is used to measure the availability of
a. N, P & K b. P, K, Ca & Micronutrients
c. Available P_2O_5 d. P & K Ans. d
227. In biological methods of soil fertility evaluation, the soil plague method is used to measure the availability of
a. N, D, K, S & lime b. P, K, Ca & Micronutrients
c. Available P_2O_5 d. P & K Ans. a
228. The biological method developed by Cunninghamella – Mehlich is used to measure the availability of
a. N, P & K b. P, K, Ca & Micronutrients
c. Available P_2O_5 d. P & K Ans. c
229. In biological methods of soil fertility evaluation, the pot culture (Jenny) method is used to measure the availability of
a. N, P & K b. N, P K, S & lime
c. Available P_2O_5 d. P & K Ans. b
230. In biological methods of soil fertility evaluation, the *Aspergillus niger* (Mehlich) method is used to measure the availability of
a. N, P & K b. P, K & Mg
c. Available P_2O_5 d. P & K Ans. b
231. In biological methods of soil fertility evaluation, the Neubaur seedling technique method is used to measure the availability of
a. P, K, Ca & micronutrients b. N, P, & K
c. N, P, K, S, & lime d. P, K & Mg Ans. a
232. Classification of nutrients based on their relative requirements was given by
a. Cate and Nelson b. Arnon
c. Nicholas d. Engelbert Ans. B

233. Classification of nutrients based on their biochemical behaviour and physiological function was given by

a. Cate and Nelson b. Emil Trong & Engel Bert
c. Nicholas d. Mengel and Kirk by Ans. d

234. Classification of nutrients based on their functions and content in plant tissues was given by

a. Cate and Nelson b. Emil Trong & Engel Bert
c. Nicholas d. Mengel and Kirk by Ans. b

235. In India decline in soil organic matter was confirmed through

a. LTFE experiments b. Pot experiments
c. Field experiments d. Fertilizer resource Ans. a

236. Organic wastes used for composting are generally

a. Poor in NPK b. High in NPK
c. Moderate in NPK d. None of the above Ans. a

237. Generally farmers in India use

a. 2/3rd of FYM for fertilizing purpose
b. 2/3rd of FYM for fuel purpose
c. 2/3rd of FYM for agricultural purpose
d. None of the above Ans. b

238. Which of the following holds a good promise of innovation in nutrient recycling?

a. Utilization of organic residues
b. FUE increase
c. Radiotracer studies
d. All Ans. d

239. Soils of India are generally

a. High in fertility
b. Poor in fertility
c. Moderate in fertility
d. None of the above Ans. a

240. Nutrients in soil can come from

a. Inorganic b. Organic
c. Biomass d. All Ans. d

241. Losses of nutrients in soils can occur due to

a. Erosion b. Leaching
c. Nutrient removal by crops d. All Ans. d

242. Inorganic source of nutrients include

a. Original rocks b. Minerals
c. Dissolved ions d. All Ans. d

243. What is/are the reasons for declining soil fertility?

a. Nutrient losses
b. Declining SOM stocks
c. Crop intensification
d. Imbalance fertilization
e. All Ans. e

244. Which country is topmost in fertilizer consumption?
a. India b. China
c. USA d. All Ans. b
245. Fertilizer consumption in India is higher in
a. Irrigated areas b. Rainfed areas
c. Both d. None of the above Ans. a
246. Which of the following states has nutrient use of < 50 kg/ha?
a. Madhya Pradesh b. Karnataka
c. West Bengal d. Uttar Pradesh Ans. a
247. Which of the following states has nutrient use of 50 – 100 kg/ha?
a. Madhya Pradesh b. Karnataka
c. West Bengal d. Uttar Pradesh Ans. b
248. Which of the following states has nutrient use of 100 – 150 kg/ha?
a. Madhya Pradesh b. Karnataka
c. West Bengal d. Uttar Pradesh Ans. c
249. Which of the following states has nutrient use of > 150 kg/ha?
a. Madhya Pradesh b. Karnataka
c. West Bengal d. Uttar Pradesh Ans. d
250. Which country of the following has highest fertilizer use?
a. South Korea b. Japan
c. China d. India Ans. a
251. What is the nutrient use efficiency of N, generally, under field conditions?
a. < 10% b. < 20%
c. < 30% d. < 40% Ans. d
252. What is the nutrient use efficiency of P, generally, under field conditions?
a. < 10% b. < 20%
c. < 30% d. < 40% Ans. b
253. What is the nutrient use efficiency of K, generally, under field conditions?
a. < 10% b. < 20%
c. < 30% d. < 40% Ans. d
254. What is the nutrient use efficiency of micronutrients, generally, under field conditions?
a. 2 – 3% b. 3 – 5%
c. 5 – 10% d. 10 – 15% Ans. b
255. Low content of soil organic matter is due to
a. Continuous cropping b. Erosion
c. Both d. None of the above Ans. d
256. Most important source(s) of organic matter is/are
a. FYM b. Compost
c. Urban and industrial area d. All Ans. d
257. If the extractable Fe in soil is 0.01 to 0.3 what will be the severity of Fe chlorosis in plants?
a. Moderate to severe b. Slight to moderate
c. Nil Fe chlorosis d. None of the above Ans. a

258. If the extractable Fe in soil is 0.3 to 2.00 what will be the severity of Fe chlorosis in plants?

a. Moderate to severe b. Slight to moderate
c. Nil Fe chlorosis d. None of the above Ans. b

259. If the extractable Fe in soil is 2.0 to 32.0 what will be the severity of Fe chlorosis in plants?

a. Moderate to severe b. Slight to moderate
c. Nil Fe chlorosis d. None of the above Ans. c

260. Fe chlorosis in plants is caused mainly due to

a. High Mn/Fe ratio b. High pH
c. Excess phosphate d. All
e. None of the above Ans. d

261. Fe chlorosis in plants is caused mainly due to

a. Excess carbonate b. Presence of free lime
c. High moisture d. All
e. None of the above Ans. d

262. Generally in soils which is the order of concentration obtained for Mn?

a. Water soluble < Exchangeable Mn < Reducible Mn
b. Exchangeable Mn < Water soluble < Reducible Mn
c. Reducible Mn < Water soluble < Exchangeable Mn
d. None of the above

263. High boron requiring crops is/are

a. Apples and Sunflower b. Alfalfa and Clovers
c. Beets and Cabbage d. All
e. None of the above Ans. d

264. High boron requiring crops is/are

a. Cauliflower b. Radish
c. Beet root d. All Ans. d

265. Medium boron requiring crops are

a. Tobacco and Tomatoes b. Lettuce and Cotton
c. Peach and Cherry d. All Ans. d

266. Medium boron requiring crops is/are

a. Peanut b. Carrot
c. Onions d. All Ans. d

267. Low boron requiring crops are

a. Wheat and Oats b. Corn and Barley
c. Peas and Beans d. All Ans. d

268. Low boron requiring crops are

a. Citrus b. Strawberry
c. Soybean d. All Ans. d

269. Which of the following scientists have reported differential uptake of boron in soils?

a. Wears and Patterson b. Martins
c. Cox and Reed d. All Ans. d

270. Acid soils formed under moderate to high rainfall are

a. High in boron status b. Low in boron status
c. Both d. All Ans. b

271. Boron tends to accumulate in soils of
a. Low rainfall regions b. High rainfall region
c. Moderate rainfall regions d. All Ans. a

272. Molybdenum disorders is also induced by excess of which of the following nutrient?
a. Mn b. Cu
c. SO_4 d. All Ans. d

273. Soils high in free Fe_2O_3 are often
a. Deficient in available Mo b. Sufficient in available Mo
c. Having no effect d. None of the above Ans. a

274. Which of the following scientist has given an index of N response of crops?
a. Bould b. Lepodevin and Robinson
c. Watson d. All Ans. d

275. Soils formed under tropical conditions are high in
a. Sesquioxides b. SiO_2
c. Both d. None of the above Ans. a

276. Total phosphorus reserve in soils consists of
a. Organic – P b. Soluble – P
c. Adsorbed – P d. Insoluble – P
e. All Ans. e

277. The per cent basic cations availability to plants can increase with the
a. Decrease in % Base Saturation b. Increase in % Base Saturation
c. No change in % Base Saturation d. All Ans. b

278. A higher % K saturation is desirable in which type of clay minerals?
a. 1 : 1 b. 2 : 1
c. 2 : 2 d. All Ans. a

279. Mostly soils have the basic cations in which of the following exchangeable form?
a. Ca > Mg > K > Na b. K > Ca > Mg > Na
c. Mg > Ca > K > Na d. K > Na > Ca > Mg Ans. a

280. Plant absorbs basic cations in which of the following order?
a. Ca > Mg > K > Na b. K > Ca > Mg > Na
c. Mg > Ca > K > Na d. K > Na > Ca > Mg Ans. c

281. Acid soluble phosphatic fertilizer is/are
a. Monocalcium phosphate b. Dicalcium phosphate
c. Tricalcium phosphate d. Bone meal and basic slag…….Ans.C

282. How many pounds of 5-10-10 fertilizer would be needed to supply 150 lbs of N?
a. 3000 b. 300
c. 150 d. 900…..Ans.A

283. If you applied 200 lbs of 10-20-20 fertilizer, how many pounds of nitrogen would be supplied?
a. 500 b. 20
c. 100 d. 250…..Ans.B

284. A soil test report recommended 1 lb of N per 1000 sq. ft. How many pounds 10-20-20 fertilizer should be applied to each 1000 sq. ft.?
a. 10 b. 5
c. 20 d. 15…..Ans.A

285. The idea of decreasing excess carbon dioxide in the atmosphere by promoting practices that increase organic matter accumulation in the soil is more likely to succeed
a. In well drained soils
b. In frequently plowed agricultural fields
c. In soils that are saturated most of the year
d. All…..Ans.C

286. The form of nitrogen that may volatilize from hog waste lagoons is
a. Ammonia b. Nitrate
c. Organic N d. Nitrite…..Ans.A

287. The relatively stable colloidal fraction of soil organic matter that contributes to the CEC of soil is called as
a. Plant residue b. Humus
c. Animal waste d. All of the above…..Ans.B

288. A table spoon of fertile topsoil from a garden
a. Is composed of only non-living material
b. Contains millions of living organisms
c. Contains only a few hundred living organisms
d. None of the above…..Ans.B

289. Mineralization of organic matter is dependent on
a. Soil organisms b. Soil texture
c. Neither of the above d. Both a and b…..Ans.A

290. The rate of decomposition of organic residue depends on
a. Environmental conditions b. The C.N ratio of the material
c. Neither of the above d. Both a and b …..Ans.D

291. Which organic residue has the greatest C.N ratio?
a. Pine straw b. Cow manure
c. Red clover d. Rice straw…..Ans.A

292. Which plant residue would decompose more rapidly and release plant available N if incorporated into the soil?
a. Pine straw b. Oak leaves
c. Red clover d. All…..Ans.C

293. Which plant nutrient could be added to accelerate composting of a pile of grain straw?
a. Adding nutrients would have no effect b. N
c. P d. K…..Ans.B

294. An example of important soil macrofauna is
a. Bacteria b. Fungi
c. Earthworms d. None of the above…..Ans.C

295. Examples of important soil microorganisms are
a. Fungi b. Bacteria
c. Actinomycetes d. All of the above…..Ans.D

296. When plant residues with a high C.N residue (e.g. wheat straw) are incorporated into soil and decomposition begins
a. Plant available N is temporarily increased
b. Plant available N is temporarily decreased
c. There is no effect on plant available N d. None of the above…..Ans.B

297. Incorporating low C.N ratio residues like red clover into the soil results in
a. Mineralization of N
b. Immobilization of N
c. Decrease of organic matter
d. Increase in proteineous N compounds…..Ans.A

298. Advantages of applying organic wastes to soils are
a. Recycling nutrients
b. Disposal of waste material
c. Reducing the need for synthetic fertilizers
d. All of the above
e. None of the above…..Ans.D

299. Fixation of N by organisms that live in the nodules on the roots of legumes is
a. Non-symbiotic nitrogen fixation
b. Symbiotic nitrogen fixation
c. Anaerobic nitrogen fixation
d. None …..Ans.B

300. Symbiotic nitrogen fixation can produce as much as
a. 100-200 lbs/ac/yr
b. 10-20 lbs/ac/yr
c. 1-2 lbs/ac/yr
d. 50-100lbs/ac/yr…..Ans.A

301. The rate of decomposition of organic matter in soils is more rapid when the soil is
a. Saturated
b. Well drained
c. Excessively drained
d. Submerged…..Ans.B

302. Denitrification occurs only if
a. Ammonium is present
b. Nitrate is present
c. Ammonium nitrate is present
d. None…..Ans.B

303. Denitrification occurs only when soil conditions are
a. Saturated
b. Well drained
c. Aeration does not affect denitrification
d. Submerged…..Ans.A

304. Conversion of ammonium to nitrate (Nitrification)
a. Requires aerobic soil conditions
b. Results in more acid soil conditions
c. Both of the above
d. Requires submerged conditions…..Ans.C

305. Nitrification requires
a. The presence of oxygen
b. The oxygen supply has no effect
c. The absence of oxygen
d. The presence of nitrate…..Ans.A

306. The main sources of the plant nutrients C, H. and O is
a. Slow release fertilizers
b. Air and water
c. Phosphate fertilizers
d. Organic matter…..Ans.B

307. The form of most of the nitrogen taken up by plants growing on well drained soil is
a. N_2
b. NO_3^-
c. NH_4^+
d. All of the above…..Ans.B

308. The form(s) of potassium taken up by plants is
a. K^+
b. K_2O
c. Potash
d. Both a and b…..Ans.A

309. The form(s) of nitrogen in soil that is most susceptible to leaching is/are the
a. Organic form
b. NH_4^+ form
c. NO_3^- form
d. Both b and c…..Ans.C

310. Most of the nitrogen in soils is in the
a. Organic form
b. Mineral form
c. Both a and b
d. None…..Ans.A

311. Nitrogen fixation refers to
a. Reaction with Fe to form insoluble compounds
b. Conversion of NH_4^+ to NO_3^-
c. Conversion of N_2 to forms that plants can utilize
d. Conversion of NO_3^- to NH_4^+…..Ans.C

312. Soil phosphorus is more available for plant uptake at pH
a. 4.5
b. 5.5-6.5
c. Above 6.5
d. below 4.5…..Ans.B

313. The secondary nutrient that strengthens plant cell walls is
a. P
b. Ca
c. K
d. S…..Ans.B

314. The source of nitrogen for manufacturing fertilizer and fixation by rhizobia is
a. Air
b. Water
c. CO_2
d. All…….Ans.A

315. Sources of calcium for plants are
a. Dolomitic limestone
b. Gypsum
c. Calcitic limestone
d. All of the above…..Ans.D

316. Source of magnesium for plants are
a. Dolomitic limestone
b. Gypsum
c. Calcitic limestone
d. All of the above…..Ans.A

317. Leaching loss from soils in the Piedmont is more of a problem with
a. Nitrate
b. Ammonium
c. Phosphorus
d. Calcium…..Ans.A

318. If a plant bed is fumigated to kill soil microorganisms, Nitrification would
a. Not be affected
b. Increase
c. Decrease
d. First increase and then decrease …..Ans.C

319. Phosphorus fixation is more of a problem on
a. Soils high in Fe and Al
b. Organic soils
c. Soils with more SO_4^{2-} ions
d. Both a and b…..Ans.A

320. Plant available phosphorus
a. Accumulates in mineral soils when fertilizers containing P are applied regularly over a number of years.
b. Cannot be maintained because it leaches out of the root zone
c. Will not be fixed in soils with high Al and Fe
d. Decreases with increase in organic matter…..Ans.A

321. Plant available nitrogen
a. Accumulates in the soil when ammonium fertilizers are applied regularly over a number of years.
b. Cannot be maintained because of leaching and other losses
c. Decreases with increase in organic matter
d. All of the above…..Ans.B

322. Which plant nutrient moves readily with the soil water when it is in the inorganic form?

a. N
b. P
c. K
d. Ca…..Ans.A

323. If a soil has a pH of 5, liming will

a. Increase the availability of all micronutrients except Mo
b. Decrease the availability of all micronutrients except Mo
c. Have no effect on availability of micronutrients
d. Decrease the availability of calcium…..Ans.B

324. Phosphorus is taken up by plants as an

a. Anion
b. Cation
c. In the organic form
d. All of the above…..Ans.A

325. Sulfur is taken up by plants as

a. Elemental sulfur
b. SO_4^{2-}
c. SO_3
d. S^{2-}…..Ans.B

326. Nitrogen fixation by legumes is often increased by inoculating the seed with

a. Mychorrizae
b. Nematodes
c. Rhizobia
d. All…..Ans.C

327. Atmospheric pollutants contribute a significant amount of this nutrient for plant uptake.

a. Ca
b. Mg
c. S
d. P…..Ans.C

328. Potassium fixation refers to

a. Atmospheric deposition of K^+
b. Trapping of K^+ ions in the interlayer space of illite
c. Reaction with iron
d. Fixed by the microorganisms…..Ans.B

329. The amount of plant available nitrogen in the soil could be decreased by

a. Ammonification
b. Nitrification
c. Denitrification
d. Mineralization…..Ans.C

330. Most soil phosphorus is in the

a. Organic form
b. Inorganic mineral form
c. Both a and b
d. None…..Ans.B

331. How many pounds of NH_4NO_3 (34% N) would be required to supply 150 lbs of N?

a. 150
b. 44
c. 441
d. 241…..Ans.C