

PARUL UNIVERSITY
COLLEGE OF AGRICULTURE

B.Sc. (Hons.) Agriculture Winter 2017 - 18 Examination

Semester: 2

Date: 08/01/2017

Subject Code: 20103103

Time: 10:30 am To 1:00 pm.

Subject Name: Soil Chemistry, Soil Fertility & Nutrient Management

Total Marks: 60

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed.**A. Fill in the blanks. (Each of 0.50 marks)****(10)**

1. The major losses of N from the soil are due to _____.
2. Azospirillum, Azotobacter, and Azorhizobium, dominant N fixers in _____ crops can grow on root surfaces and penetrate root tissues.
3. The function of _____ is to translocation of sugars, starches, N and P.
4. _____ regulates stomata opening and closing.
5. Fe deficiency is mostly seen in crops growing on _____ soil.
6. Gray speck of oats and marsh spot of peas is due to the deficiency of _____.
7. _____ dose of Nitrogen causes more vegetative growth, dark green leaves, lodging, maturity is delayed with increases susceptibility to pest and disease.
8. _____ is essential for the formation and transfer of starches and sugars.
9. _____ take parts in leg hemoglobin metabolism and Ribonucleotide reductase .
10. Mg and S are termed as _____ nutrients.
11. Zn and Fe are termed as _____ nutrients.
12. In _____ crop Khaira is observed due to deficiency of zinc micro-nutrient.
13. Element which is constituent of cell membrane and essential for cell division is _____.
14. _____ establishes early root development and growth, thereby helping to establish seedling quickly.
15. _____ is a primary constituent of chlorophyll.
16. _____ is not constituent of chlorophyll but, it helps in chlorophyll formation and Encourages vegetative growth.
17. _____ is a constituent of cell wall and increases in stiffness of plants.
18. _____ is used for the reclamation of alkaline soils.
19. _____ helps in the synthesis of chlorophyll.
20. _____ is essential for maintaining turgor and growth of Plants and helps oxalic acid accumulation in Plants .

B. Multiple choice type questions. (Each of 0.50 mark)**(10)**

1. In alkaline soils (pH < 7.0), most inorganic P is found in compounds containing _____.

a) Iron	c) Calcium
b) Aluminium	d) None of the above
2. Nutrient highly mobile in plants is

a) N ; P	c) Mo
b) K ; Mg	d) All of these
3. Which one of the following is a micronutrient?

a) Nitrogen	c) Zinc
b) Calcium	d) Potassium
4. The following micro-organisms are responsible for nitrification.

a) Nitrosomonas	c) Bacillus
b) Azotobacter	d) PSB

5. N deficiency induce
- Stunting
 - yellowing of lower leaves
 - Flower buds turn yellow
 - All of these
6. K plays importance role in
- Lodging prevention
 - Disease resistance
 - Stomatal conductance
 - All of these
7. Deficiency symptom of Mg nutrient
- Reddening of cotton
 - Yellowing of leaves
 - Chlorosis of leaves
 - None of the above
8. Which one of the following is a secondary nutrient?
- Nitrogen
 - Iron
 - Magnesium
 - Boron
9. Green manure crop suitable under alkali and waterlogged soil is
- Sunnhemp
 - Guar
 - Dhaincha
 - None of these
10. Which material is used for ameliorating alkali soils
- Gypsum
 - Lime
 - H₂SO₄
 - None of these
11. A soil which has pH <8.5, ESP <15 and EC > 4dS/m at 25C is called:
- Saline soil
 - Alkaline soil
 - Saline-alkaline soil
 - None of these
12. Acid soils can be reclaimed by addition of
- CaCO₃
 - H₂SO₄
 - CaSO₄.2H₂O
 - HNO₃
13. Micro nutrients are called as
- Trace elements
 - Oligo elements
 - Spurne elements
 - All of these
14. Element responsible for pollen development is
- N
 - Ca
 - B
 - Mn
15. Most commonly use Fe fertilizer is
- Ferrous sulphate
 - Macro pores
 - Both micro and macro pores
 - None of the above
16. The following plant nutrient is responsible for plant disease resistance.
- Nitrogen
 - Phosphorous
 - Potassium
 - Iron
17. N, P and K are called as what type of nutrients.
- Trace nutrients
 - Micronutrients
 - Secondary nutrients
 - Major nutrients
18. Chlorosis refers to the-
- development of reddish brown colour on the leaf
 - Yellowing of the leaf tissue
 - Death of the leaf tissue
 - Burning of the leaf tissue
19. Leaves will show characteristic bluish green colour (red purple) due to following nutrient deficiency symptoms
- Potassium
 - Phosphorous
 - Calcium
 - Magnesium
20. Mention the nutrient element involved in the synthesis of tryptophane.
- Cu
 - Zn
 - B
 - Mo

C. Give the sentence true or false. (Each of 0.50 mark)

(05)

- Reduction of nitrates to nitrogen oxide compound and to elemental nitrogen is known as Denitrification .

2. Less mobile elements in plants shows deficiency symptoms at tip of plant.
3. Neem coated urea increases solubility and nitrification.
4. Rice prefers nitrite form of fertilizer.
5. P and K fertilizers are applied to deep placement method of application.
6. The internodes are shortened so plant becomes dwarf in corn crop due to deficiency of zinc.
7. STCR approach varies from place to place.
8. Calcium deficiency is more common in acidic soils.
9. Tea, coffee, turnip and berry trees prefer alkaline pH.
10. The sulphur function is to aids in the formation of oils and parts of protein molecules.

Q.2 Do as Directed.

A. Match group A with group B. (Each of 0.50 marks)

(05)

- | A | B |
|---------------------------------|--------------------------------------|
| 1) Zn deficiency disease crops | a) Molybdenum |
| 2) Soil testing rating very low | b) Acceleration of vegetative growth |
| 3) Ammonium sulphate | c) Chlorosis |
| 4) FYM | d) 19% Fe percent |
| 5) Nitrogen | e) Rice-paddies |
| 6) Iron | f) Boron |
| 7) Ferrous sulphate | g) Straight fertilizer |
| 8) Pollen formation | h) 0-10 Fertility index |
| 9) Nitrate reductase activity | i) Phosphorus |
| 10) Nucleic acid | j) Organic manure |

B. Define the following. (Any ten)

(05)

1. Buffering capacity
2. Acid forming fertilizer
3. Available nutrient:
4. Beneficial elements
5. Chlorosis
6. Macronutrient
7. Soil fertility
8. Green manure crop
9. Fertilizer grade
10. Mineralization
11. Immobilization
12. Sodic soils

C. Answer the following. (Any ten)

(10)

1. In which form plant take phosphorus from the soil?
2. What is the best management practices of soil pollution.?
3. What are the functions of iron?
4. How you will reclaim alkali soils?
5. How you would evaluate the quality of irrigation water on the basis of salinity hazard?
6. What are the functions of Molybdenum?
7. Enlist the name of straight phosphatic fertilizers produced in India.
8. Enlist the names of factors affecting P fixation?
9. Enlist the name of specific ions toxicity hazard in evaluating the quality of irrigation water.
10. Enlist the name of beneficial elements.
11. What are the deficiency symptoms of nitrogen?
12. How you will correct iron deficiency in soil?

Q.3 Write short notes. (Any five)

(10)

1. Losses of nitrogen
2. Function of potassium
3. Functions of Iron
4. Function of zinc
5. What are the essentiality criteria described by Arnon and Stout (1939)?
6. Enlist major plant nutrients and their function.

Q.4 Differentiate the following. (Any five)

(05)

1. Soil fertility Vs Soil productivity
2. Major nutrients Vs Secondary nutrients
3. Nitrification Vs Denitrification
4. Deficiency of N Vs Toxicity of N
5. Mobile elements in plants Vs Immobile elements in plants
6. Physical Amelioration Vs Chemical Amelioration
7. Saline soils Vs Alkali soils