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Term End Examination 2025-2026**Programme – B.Sc.(Ag)-Hons-2025****Course Name – Soil Fertility Management****Course Code - BAG27105(T)****(Semester II)****Full Marks : 40****Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 10=10

1. Choose the correct alternative from the following :

- (i) Who proposed the Law of Minimum in soil fertility?
 - a) Justus von Liebig
 - b) Arnon and Stout
 - c) Emanuel Epstein
 - d) Simonson
- (ii) What is the main form of nitrogen absorbed by plants?
 - a) Ammonium
 - b) Nitrate
 - c) Nitrite
 - d) Urea
- (iii) Select the process that is most responsible for converting organic nitrogen into a form that plants can use.
 - a) Fixation
 - b) Nitrification
 - c) Denitrification
 - d) Immobilization
- (iv) Identify the primary factor that determines the mobility of phosphorus in the soil.
 - a) Soil pH
 - b) Soil texture
 - c) Organic matter
 - d) Soil temperature
- (v) Explain the concept of hidden hunger in plants.
 - a) Yield loss without visible symptoms
 - b) Soil erosion affecting nutrient availability
 - c) Inadequate moisture causing poor growth
 - d) Over-fertilization causing toxicity
- (vi) Distinguish between soil fertility and soil productivity.
 - a) Soil fertility refers to crop yield, while soil productivity refers to nutrient availability
 - b) Soil fertility refers to nutrient availability, while soil productivity relates to yield
 - c) Soil fertility and productivity are the same
 - d) Soil fertility is a broader term than productivity
- (vii) Evaluate the role of integrated nutrient management (INM) in modern agriculture.
 - a) INM is not practical in modern farming
 - b) INM only focuses on chemical fertilizers
 - c) INM optimizes nutrient use efficiency while maintaining soil health
 - d) INM ignores environmental sustainability
- (viii) Diagnose the nutrient limitations in soils based on visual plant symptoms.

- a) Visual symptoms help diagnose deficiencies or toxicities but should be verified with testing b) Visual symptoms are always accurate without further testing
- c) Visual symptoms cannot detect deficiencies d) Visual symptoms are only useful for nitrogen deficiency
- (ix) Analyze the role of soil texture in nutrient retention.
- a) Soil texture does not influence nutrient retention b) Finer soils retain more nutrients due to higher cation exchange capacity
- c) Coarse soils retain more nutrients due to better aeration d) Nutrients are retained in sandy soils, but leach out easily
- (x) Classify manures based on nutrient concentration and quantity applied.
- a) Straight, complex and mixed manures b) Bulky organic manures and concentrated organic manures
- c) Primary, secondary and micronutrient manures d) Aerobic and anaerobic manures

Group-B

(Short Answer Type Questions)

2.5 x
10=25

2. Mention the three criteria of essentiality proposed by Arnon and Stout (1939). (2.5)
3. Classify essential nutrients based on quantity required by plants. (2.5)
4. Explain the relationship between soil fertility and soil productivity. (2.5)
5. A soil test shows adequate NPK, but crop yield remains low. Apply fertility vs productivity to justify why this can happen. (2.5)
6. A farmer applies high phosphorus continuously and later observes zinc deficiency symptoms. Apply nutrient interaction principles to explain. (2.5)
7. Describe the four forms of potassium present in soil. (2.5)
8. Explain why phosphorus availability is low in most cultivated soils. (2.5)
9. Classify nutrient deficiency into absolute and induced deficiency with examples. (2.5)
10. Describe the concept, objectives, and components of Integrated Nutrient Management (INM). (2.5)
11. Classify organic manures and explain each class with examples and characteristics. (2.5)

OR

Explain why exclusive use of chemical fertilizers is not sustainable in agriculture. (2.5)

Group-C

(Long Answer Type Questions)

5 x 1=5

12. Evaluate the effectiveness of mass flow, diffusion, and root interception in nutrient uptake, and explain which nutrients rely more on each mechanism. (5)

OR

Assess the significance of nitrogen transformation processes in minimizing nitrogen losses and improving fertilizer use efficiency. (5)

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