

M. Sc. (Ag) Semester-III Examination, 2016
Agronomy
Course: AGR 502
(Principles and Practices of Soil Fertility and Nutrient Management)

Time: 3 hours

Full Marks: 50

Questions are of values as indicated in the margin.

Answer any five questions.

1. Write short notes on *any five* of the following: 2x5 = 10
 - a. Behaviour of urea in soil
 - b. Nitrogen use efficiency
 - c. Fertilizer mixture
 - d. Forms of soil phosphorus
 - e. Scope of organic farming in India
 - f. Brown manuring
 - g. Symbiotic nitrogen fixation
2. Give appropriate reasons for the following statements (*any five*): 2x5 =10
 - a. Deficiency of zinc occurs due to high rate of application of phosphatic fertilizers.
 - b. Concentration of H_2PO_4 is more in acidic soil than alkaline soil.
 - c. Soil rich in montmorillonite and vermiculite clay minerals has higher K availability.
 - d. Potassium sulphate is preferred source of K fertilizer for tobacco and potato.
 - e. Soil acidity reduces nitrification.
 - f. Response to the application of K fertilizers is low in India.
 - g. Urea should be incorporated to the reduced zone of rice soil.
3. Differentiate between *any five* of the following: 2x5=10
 - a. Broadcasting and placement method of fertilizer applicaiton
 - b. Soil fertility and soil productivity
 - c. Bulky organic manure and concentrated organic manure
 - d. Beneficial elements and essential elements
 - e. Nitrification and denitrification
 - f. Slow release Nitrogen fertiliser and nitrification inhibitor
 - g. Complete fertilizers and mixed fertilizers
4. Briefly explain the following (*any four*): 2.5x4=10
 - a. P- Fixation mechanisms in acid soil.
 - b. Factors affecting quality of FYM
 - c. Functions of K in plant growth and development
 - d. How does organic matter maintain the soil health
 - e. Principles governing the time of fertilizer application
 - f. Principles of site specific nutrient management

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5. Answer the following 2+2+3+3 =10
- What do you mean by K-fixation? Enumerate different factors affecting K-fixation in soil.
 - What do you mean by immobilization of nitrogen in soil? If rice straw (C:N ratio 60:1 with 45% C and 0.75% N) is to be incorporated into soil @ 5 t/ha then how much N is to be applied to check immobilisation of N ? (1+3)+(2+4)=10
6. Write two important roles and two important deficiency symptoms of *any five* of the following nutrients: 2x5=10
- | | | | |
|-------|-------|-------|-------|
| a) N | b) S | c) Mg | d) Zn |
| e) Fe | f) Mo | g) B | |
7. Write short note on *any four* of the following: 2.5x4=10
- Integrated nutrient management
 - K-equilibrium in soil
 - Crop residue management
 - Liquid biofertilizer
 - Synthesis of nitrogenous fertilizers
 - Law of diminishing return
8. Briefly answer the following questions (*any five*): 2x5=10
- State inverse yield nitrogen law
 - What are the compositions of Biosuper formulation?
 - Give examples with the nutrient content of the following:
Green manure, compound fertilizer, concentrated organic manure and straight fertilizer
 - Write composition of urea and single super phosphate.
 - Explain agronomic efficiency and apparent recovery of nutrient use.
 - What do you mean by physical optimum and economic optimum yield?
 - Explain important principles governing fertilizer use in intensive cropping system.
