**PRACTICE SET**
**End Semester (3rd Sem.) Examination, Dec.2025**

**Program: M. Sc. (Ag.) Agronomy**

**Semester: 3rd**

**Course: Soil Biology and Biochemistry**

**Course Code:13A.SS.502**

| **Course Outcome:** | **At the end of the course the students will be able to:** |
|---|---|
| CO1: | Understand basics of soil biology and biochemistry |
| CO2: | Comprehend soil biota and biochemistry |
| CO3: | Produce biogas and manures |
| CO4: | Determine soil microbial population, soil microbial biomass and fractionation of organic matter. |

## Unit / Module-1

**Section: I (5 Marks questions, only Lower order Thinking -LOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 1. | Define soil microbial biomass . Enlist the types of organisms in different soils. | Remember | CO1 |
| 2. | Explain the importance of microbial interactions in soil. | Understand | CO1 |
| 3. | Demonstrate how soil pH affects microbial growth. | Apply | CO1 |
| 4. | Describe phyllosphere and rhizosphere. | Understand | CO1 |
| 5. | Illustrate how root–soil interface affects microbial ecology. | understand | CO1 |

**Section: II (15 Marks questions, HOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 6. | Breakdown and classfy the microbial interaction discussing its types. | Analyse | CO1 |
| 7. | Distinguish between the roles of bacteria and fungi in soil systems. | Analyse | CO1 |
| 8. | Propose strategies for enhancing soil microbial activity naturally. | Create | CO1 |
| 9. | Recommend the management strategies to conserve soil biota. Explain the role and importance of soil biota. | Evaluate | CO2 |
| 10. | Interpret how temperature and moisture influence soil enzyme function. | Analyse | CO1 |

## Unit / Module-2

**Section: I (5 Marks questions, only Lower order Thinking -LOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 11. | Illustrate microbial transformations through Nitrogen cycle. | Apply | CO2 |
| 12. | State the biochemical composition of soil organic matter | Remember | CO2 |
| 13. | Relate microbial transformations to soil fertility management. | Apply | CO2 |
| 14. | Discuss the significance of nutrient cycling in maintaining soil fertility. | Understand | CO2 |
| 15. | Enlist the factors affecting soil organic matter. | Remember | CO2 |

**Section: II (15 Marks questions, HOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 16. | Design cycles for microbial transformations of Phosphorus and Sulphur in soil. | Create | CO4 |
| 17. | Analyze the link between organic matter decomposition and humus formation. | Analyse | CO2 |
| 18. | Distinguish between humic matter and non-humic matter. Conclude the process of humus formation. | Analyse | CO4 |
| 19. | Recommend any three biodegradation process through different microorganisms and also explain the stages involved in this. | Evaluate | CO2 |
| 20. | Create a visual diagram linking all microbial nutrient cycles. | Create | CO2 |

## Unit / Module-3

**Section: I (5 Marks questions, only Lower order Thinking -LOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 21. | Explain the process of biogas production from organic waste. | Understand | CO3 |
| 22. | Use farm residues for compost preparation following scientific methods. | Apply | CO3 |
| 23. | Define biodegradation and list types of manures produced from organic waste. | Remember | CO3 |
| 24. | Identify microbes involved in biogas production. | Remember | CO3 |
| 25. | Compare organic manures with concentrated organic manures. | Understand | CO3 |

**Section: II (15 Marks questions, HOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 26. | Analyze the role of biotic factors in soil development. | Analyse | COE |
| 27. | Design a rural composting model for farmers' training. | Create | CO3 |
| 28. | Judge the effectiveness of vermicomposting vs pit composting | Evaluate | CO3 |
| 29. | Distinguish between aerobic and anaerobic decomposition. | Analyse | CO3 |
| 30. | Compare various organic waste management practices used in rural agriculture. | Analyse | CO3 |

## Unit / Module-4

**Section: I (5 Marks questions, only Lower order Thinking -LOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 31. | Define fertilizer and biofertilizer. | Remember | CO4 |
| 32. | Mention different criteria for a quality biofertilizer. | Remember | CO1 |

| | | | |
|---|---|---|---|
| 33. | Apply BIS standards to assess biofertilizer quality | Apply | CO4 |
| 34. | Discuss the role of biofertilizers in achieving the objective of sustainable agricultural practices | Understand | CO4 |
| 35. | Describe the method of biofertilizer production step-by-step | Understand | CO4 |

**Section: II (15 Marks questions, HOT)**

| Sl. No. | Model Questions | Bloom Taxonomy | CO |
|---|---|---|---|
| 36. | Assess the role of fertilizers in promoting or degrading soil health | Evaluate | CO4 |
| 37. | Compare chemical, organic, and biofertilizer effects on soil health. | Analyse | CO4 |
| 38. | Evaluate how biofertilizers contribute to crop production agriculture with examples | Analyse | CO4 |
| 39. | Evaluate how BIS standards can be applied to formulate and ensure the quality parameters of a biofertilizer product.and justify their significance in maintaining product efficiency and environmental safety. | Create | CO4 |
| 40. | Distinguish between carrier-based and liquid biofertilizers. | Analyse | CO4 |

## Summary Sheet:

### CO Wise

| CO | Q. No | Marks |
|---|---|---|
| CO1 | 31,32,33,34,35,36,37,38,39,40 | 100 |
| CO2 | 1,2,3,4,5,6,7,8,9,10 | 100 |
| CO3 | 21,22,23,24,25,26,27,28,29,30 | 100 |
| CO4 | 11,12,13,14,15,16,17,18,19,20 | 100 |
| **Total** | | **400** |

### Unit Wise

| Unit | Q. No | Marks |
|---|---|---|
| Unit 1 | 1-10 | 100 |
| Unit 2 | 11-20 | 100 |
| Unit 3 | 21-30 | 100 |
| Unit 4 | 31-40 | 100 |
| **Total** | | **400** |

## Blooms Taxonomy Level (BTL) Wise

| BTL | Q. No | Marks |
|---|---|---|
| LOT | 1,2,3,4,5,11,12,13,14,15,21,22,23,24,25,31,32,33,34,35. | 100 |
| HOT | 6,7,8,9,10,16,17,18,19,20,26, 27,28,29, 30 ,36,37,38,39,40. | 300 |
| **Total** | | **400** |

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**Disclaimer: -** This is a practice set. The Question in End semester examination will differ from the practice set. This practice set is meant for practice only.