

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER EXAMINATION

Discipline-Specific Elective Course (DSE)

MG5DSEBOTA06: SOIL MICROBIOLOGY

(2024 ADMISSION ONWARDS)

Time: 2 Hrs

Maximum Marks: 70

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I), and Appreciation (Ap)

Student should attempt at least one question from each course outcome to enhance their overall outcome attainability

Part A

One or two Sentences

Answer any ten questions. Each question carries 2 marks

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|--|-----|-----|
| 1. Define soil microbiology. | [K] | [1] |
| 2. Mention two roles of soil organic matter. | [K] | [1] |
| 3. What is soil porosity? | [K] | [2] |
| 4. State two functions of clay colloids in soil. | [U] | [2] |
| 5. Distinguish between humification and mineralization. | [U] | [3] |
| 6. What is meant by alkaline soil? | [U] | [2] |
| 7. Name any two soil enzymes. | [K] | [2] |
| 8. Define soil genesis? | [K] | [3] |
| 9. Mention two biological agents of weathering. | [K] | [3] |
| 10. Explain the influence of soil pH on microbial populations. | [U] | [4] |
| 11. What are phosphate-solubilizing bacteria? | [U] | [1] |
| 12. Name the two partners involved in a lichen association. | [K] | [4] |

(2 × 10 = 20)

PART - B

Short answer

Answer any eight questions. Each question carries 5 marks

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|---|------|-----|
| 13. Justify the use of biofertilizers in sustainable crop production. | [E] | [5] |
| 14. Describe the different horizons of a typical soil profile. | [U] | [3] |
| 15. Explain physical, chemical, and biological weathering. | [U] | [3] |
| 16. Describe the importance of nitrogen-fixing cyanobacteria in paddy fields and other soils. | [An] | [4] |
| 17. Explain the ecological significance of microbial interactions in the rhizosphere. | [An] | [4] |
| 18. Compare the characteristics and functions of lichens and mycorrhiza. | [U] | [4] |
| 19. Define carbon sequestration and explain its importance. | [U] | [1] |
| 20. Describe the role of phosphate-solubilizing microorganisms in phosphorus nutrition. | [U] | [1] |
| 21. Evaluate the effects of monocropping on soil microbial diversity and soil fertility. | [E] | [5] |
| 22. Describe the use of microorganisms as indicators of water pollution. | [K] | [1] |

(5 × 8 = 40)

PART – C

Essay

Answer any one question. Each question carries 10 marks

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|---|------|-----|
| 23. Compare commensalism, amensalism, synergism, proto cooperation, competition, and predation. | [An] | [4] |
| 24. Explain the Rhizobium–legume symbiotic association. | [U] | [1] |

(10 × 1 = 10)