



Faculty of Agriculture

End Semester Examination May 2025

AG3CO28 Problematic Soils & Their Management

Programme	: B. Sc. (Hons.)	Branch/Specialisation	: AG
Duration	: 3 hours	Maximum Marks	: 50

Note: All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Section 1 (Answer all question(s))

Marks CO BL

Q1. The capacity of soil to function as a vital living system within land use boundaries is known as-

1 1 2

Rubric	Marks
d) Both a and b	1

- ☐ Soil health
 ☐ Soil quality
☒ Both (A) and (B)
 ☐ None of these

Q2. Productivity and sustainability of any production system depend upon-

1 1 2

Rubric	Marks
All of the above	1

- ☐ Management practices
 ☐ Environment
☐ Soil quality
 ☒ All of the above

Q3. Salt affected soils of the arid regions belong to the order-

1 2 1

Rubric	Marks
Aridisols	1

- ☐ Alfisols
 ☐ Gellisols
☐ Vertisols
 ☒ Aridisols

Q4. Which is the dominant clay mineral in the salt affected soils of the Indo Gangetic Plains?

1 2 1

Rubric	Marks
Mica	1

- ☐ Vermiculite
 ☒ Mica
☐ Both (A) and (B)
 ☐ None of the above

Q5. The quality of irrigation water differs in various regions based on-

1 3 2

Rubric	Marks
All of the above	1

- ☐ The groundwater quality
 ☐ The rainfall intensity
☐ Aquifer recharge
 ☒ All of the above

Q6. Which category of Residual Sodium Content (RSC, meql-1) is considered safe-

1 3 1

Rubric	Marks
Less than 1.25	1

- ☒ Less than 1.25
 ☐ 1.25-2.50
☐ Greater than 2.5
 ☐ None of these

Q7. Remote sensing technique for problematic soil assessment includes-

1 4 3

Rubric	Marks
All of the above	1

- ☐ Multispectral imaging
 ☐ Hyperspectral imaging
☐ Drone based remote sensing
 ☒ All of the above

Q8. GIS technique for problematic soil assessment includes-

1 4 3

Rubric	Marks
Soil mapping	1

- ☒ Soil mapping
 ☐ Spectroscopy
☐ Thermal imaging
 ☐ None of the above

Q9. The benefits from multipurpose tree species includes-

1 5 2

Rubric	Marks
All	1

- ☐ Food
 ☐ Cash
☐ Social production
 ☒ All of these

Q10. Which among the following is a bioremediation technique?

1 5 3

Rubric	Marks
All of the above	1

- ☐ Phytoextraction
 ☐ Phytostabilization
☐ Rhizofiltration
 ☒ All of the above

Section 2 (Answer all question(s))

Marks CO BL

Q11. What do you understand by wasteland?

1 1 2

Q12. What are the causes of wasteland formation?

2 1 4

Q13. (a) Discuss soil quality indicators.

5 1 5

(OR)

(b) Classify cultivable and uncultivable wastelands.

Rubric	Marks
cultivable wastelands. 2.5 marks uncultivable wastelands. 2.5 marks	5

Section 3 (Answer all question(s))

Marks CO BL

Q14. Write the formula for exchangeable sodium percentage (ESP) and sodium adsorption ratio (SAR).

1 2 1

Q15. What are the major sources of salinity and alkalinity?

3 2 2

Q16. (a) Discuss various reclamation management techniques in saline soils.

4 2 3

(OR)

(b) How acid sulphate soils are formed? How it can be managed?

Rubric	Marks
How acid sulphate soils are formed? 2 marks	4
How it can be managed? 2 marks	

Section 4 (Answer all question(s))

Marks CO BL

Q17. Write the formula for residual sodium carbonates (RSC) in meql-1.

2 2 1

Q18. (a) Enlist the basic criteria for evaluating water quality for irrigation purposes.

6 3 4

(OR)

(b) Discuss the management methods of salinity problems in irrigation water.

Section 5 (Answer all question(s))

Marks CO BL

Q19. What do you understand by remote sensing technique?

2 4 2

Q20. Write Geographic Information Systems.

2 4 2

Q21. (a) Discuss the remote sensing and GIS technique for problematic soil assessment.

4 4 3

Rubric	Marks
remote sensing technique for problematic soil assessment. 2 marks	4
GIS technique for problematic soil assessment 2 marks	

(OR)

(b) Discuss the challenges and opportunity of using remote sensing and GIS to manage problematic soil.

Rubric	Marks
challenges of using remote sensing and GIS to manage problematic soil. 2 marks	4
opportunity of using remote sensing and GIS to manage problematic soil 2 marks	

Section 6 (Answer any 2 question(s))

Marks CO BL

Q22. What are multi-purpose tree species (MPTs)? Discuss characteristics of MPTs using suitable examples.

4 5 3

Rubric	Marks
What are multi-purpose tree species (MPTs)? 2 marks	4
Discuss characteristics of MPTs with examples. 2 marks	

Q23. Discuss bioremediation of problematic soils.

4 5 2

Q24. Define land capability. Elaborate land suitability classification.

4 5 3

Rubric	Marks
Define land capability. 1 marks	4
Elaborate land suitability classification. 3 marks	
