



KERALA AGRICULTURAL UNIVERSITY
B. Sc. (Hons.) Ag . 2016 Admission
IV Semester Final Examination-July-2018

asac.2206

Problem soils and their management (2+0)

Marks: 50

Time: 2 hours

(10x1=10)

I Fill in the blanks:

- 1 ----- is the acidity develops due to hydrogen and aluminium ions concentration of the soil solution.
- 2 ----- is the formula used to calculate potential salinity
- 3 A mineral or organic soil horizon that has a pH less than 3.5, is toxic to plant

State True or False

- 4 Acid soils are rich in available calcium and magnesium.
- 5 Salt index is negative for good quality water.
- 6 Nitrogen mineralization stops at ammonification stage in submerged soil.

Match the following

A

B

- | | |
|---|-------------------------|
| 7 Hydrogen sulphide | a Slowly permeable soil |
| 8 Negative logarithm of electron activity | b pE |
| 9 Compaction technology | c Highly permeable soil |
| 10 Raised and Sunken bed | d Akiochi |

II Write Short notes on ANY FIVE of the following

(5x2=10)

- 1 How does soil pH influence the availability of nutrients and plant growth?
- 2 What are the sources of H⁺ ions that make the soil acidic?
- 3 Short note on phytoremediation.
- 4 How does white alkali soils develop?
- 5 Universal soil loss equation.
- 6 Leaching requirement.
- 7 Over-liming of acid soil has adverse effect on nutrient availability and crop growth –

III Answer ANY FIVE of the following

(5x4=20)

- 1 What are all the physical constraints of high clay containing soils? Discuss the method for the management of slowly permeable soils.
- 2 Discuss the causes for the origin of crusted soils and explain the constraints and management practices of crusting soils
- 3 Discuss lime as a component of INM in managing soil health and crop productivity.
- 4 Discuss the various agronomic practices for the management of poor quality waters in agriculture
- 5 What is soil conservation and what are the various methods of soil conservation?
- 6 Calculate the gypsum requirement to reclaim a sodic soil with an ESP of 40 and CEC of 20 cmol(p⁺)kg⁻¹ to reduce the ESP of upper 30 cm soil to about 10%. Assume the purity of the gypsum to be applied is 70%.

P T O

- 7 An irrigation water contains 450, 200, 20, 600, 500 mg L⁻¹ of Na²⁺, Ca²⁺, Mg²⁺, CO₃²⁻, HCO₃⁻ respectively. Calculate
- SAR
 - RSC
 - Approximate EC in dS m⁻¹
 - Osmotic pressure of irrigation water.

IV

Write an essay on ANY ONE of the following

(1x10=10)

- 1 Nutritional changes (N, P and K) during submergence and sequential reduction process of submerged soil.
- 2 Discuss briefly about the parameters used to assess the quality of irrigation water. Give CSSRI classification of irrigation water.
