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B.Sc (AG)

4th SEMESTER REGULAR EXAMINATION-NOV-2019
SC-241

Problematic Soils and their Management

Time : 2 Hours

Maximum : 50 Marks

(Answer all questions of Section – A)

SECTION – A

1. Fill in the blanks [5x1=5]

- a) Soil acidity is common in all region where rainfall is _____ and soil salinity is common in all region where _____ is.
- b) The amount of lime required to be added to acidic soil to raise the pH to a desired value is known as _____ requirement while the amount of gypsum required to ameliorate the soil is known as _____ requirement.
- c) Sodic soils usually have a surface crust of _____ colour and they are having pH more than _____
- d) Coconut tree is _____ tree as it provides more than _____ products.
- e) Saline soils usually have a surface crust of _____ colour and electrical conductivity value of saline soil is more than _____.

2. Tick correct answer from multiple choice [10x0.5=5]

- a) Ideal pH for the growth of most of crop is
a. 6.5-7.5 b. 7.8-8.5 c. 5.5-6.2 d. 8.5-9.0
- b) The ability of soil to resist changes in pH is called
a. Soil acidity b. Soil salinity c. Soil sodicity d. Buffering capacity
- c) Soil health indicators is/are
a. Physical b. Chemical c. Biological d. all
- d) Soils have slight limitations that restrict their use and depicted by green colour are
a. Class I b. Class II c. Class III d. Class IV
- e) Exchangeable sodium percentage for sodic soil is more than
a. 1 b. 5 c. 10 d. 15
- f) Ponding of water for optimum crop growth promotes build-up partial pressure of salts, resulting from the exchange of Na by Ca. Hence, the crop preferred to grow during reclamation of alkali soils owing to its high tolerance to soil sodicity is
a. Rice b. Lentil c. Pigeon pea d. Safflower
- g) Bulk density increases with increase in
a. Compaction b. Addition of organ matter c. Both d. None
- h) Which of the following soils have poor physical conditions
a. Saline b. Sodic c. Both d. None
- i) Trees that are deliberately grown for more than one output is called
a. Multipurpose trees b. Single purpose trees c. Both d. None
- j) Which of the following are multipurpose trees
a. Moringa b. Coconut tree c. Neem d. All



3. Write True/False

[10x0.5=10]

- a) The acidity of hydrogen ions in the soil solution is called active acidity and it is measured and expressed as soil pH.
- b) Salinity hazard is due to high concentration of sodium in water.
- c) Acid soil is base saturated soil.
- d) Soil acidity is common in all region where rainfall is low
- e) The acid soils in India is located in Rajasthan.
- f) Adsorption of H and Al ions in soil colloids make soil alkaline.
- g) Fraction of water that must be leached through the root zone to control soil salinity at specified level is defined as leaching requirement.
- h) A soil may be alkaline (pH more than 7.0), but not necessary alkaline or sodic.
- i) Soils containing excess of neutral soluble salts dominated by chlorides and sulphates are called sodic soil.
- j) The structure of land capability classification is capability class, capability subclass and capability unit.

4. Match column I with column II correctly

[10 x 0.5 = 10]

- | | |
|-------------------------------|---|
| i Saline soil | a. Excess of soluble salts |
| ii Flooding of rice fields | b. Dominance of sodium ion on soil colloids |
| iii Acid sulphate soil | c. pH less than 4.0 |
| iv Sodic soils | d. High bulk density |
| v Compacted soil | e. Base unsaturated soils |
| vi Waste lands | f. Soil ph |
| vii Management of saline soil | g. Leaching with good quality irrigation water |
| viii Management of sodic soil | h. Gypsum act as source of ca to exchange Na on soil colloids |
| ix Acid soil | i. pH raise to almost neutrality |
| x Active Acidity | j. degraded forest, barren land, eroded land, overgrazed pasture etc. |

SECTION -B

Attempt any five question in brief. Each question carries 6.0 marks.

[5 x 6 = 30]

- 5. What do you mean by saline and sodic soils? Differentiate between them. Also write in brief about management of saline and sodic soils.
- 6. What is multipurpose tree species? Write their use under different problem soils.
- 7. Write in brief about land capability classification
- 8. How acid sulphate soil develop? Write its characteristics and management for agriculture.
- 9. Role of Remote sensing & GIS in diagnosis and management of problem soil. Describe
- 10. Define soil quality and soil health. Differentiate between them with suitable examples