| Reg. No. | | | | | | | | | | |
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# GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
# (GIET UNIVERSITY)

## B. Sc. (Ag.) (Fourth Semester) Examinations, April – 2025
## AC-224– Problematic soils and their Management

Time: 2 hrs Maximum : 50 Marks

**The figures in the right hand margin indicate marks.**

### PART – A

**Q.1. Fill in the blanks with suitable word / figure. (0.5 x 10 = 5 Marks)**

a. ---------- is a biological indicator of soil quality.
b. ----------the primary cation in gypsum that aids alkali soil reclamation
c. Class I lands in capability classification are the most _____ for cultivation.
d. ---------- causes deflocculation or dispersion in clay colloids
e. Conversion of pollutants into volatile forms is called----------
f. The primary use of hyperspectral imaging in soil is to detect soil----------
g. ---------- states come under arid and semi-arid agroecological zones in India.
h. ----------region of India contain acid soil and Laterite soil
i. ----------is a example of acid tolerant crop.
j. Minerals ---------- present in acid sulphate soils.

**Q. 2. Define (or) Explain the following in one or two sentences. (1 x 5 = 5 Marks)**

a. Acid Sulphate soil
b. Sodic soil
c. Phytoremediation
d. Remote sensing and GIS
e. Bicarbonate hazard

**Q3. Match the following (0.5 x 10 = 5 Marks)**

| Column – A | | Column – B | |
|---|---|---|---|
| (a) | Ideal pH range | (i) | mEq/L |
| (b) | Lime | (ii) | Gypsum |
| (c) | Bicarbonate hazard | (iii) | Cat clay |
| (d) | Near Infra Red | (iv) | Barley |
| (e) | Alkali | (v) | Soil texture |
| (f) | Organic soil pollution | (vi) | Acid sulphate soil |
| (g) | physical soil indicator | (vii) | Solods |
| (h) | pH<3.5 | (viii) | 6.5-7.5 |
| (i) | saline | (ix) | Remote sensing |
| (j) | Salt-tolerant | (x) | Sewage sludge |

**Q4. Write True or False against each statement** **(0.5 x 10 = 5 Marks)**

a. Alkali soils are characterized by high levels of Exchangeable sodium.
b. Leaching requirement is associated with removing excess salts..
c. Rill erosion is done by wind agent.
d. Near infrared electromagnetic spectrum is used for rempote sensing of problematic soil
e. Primary aim of reclaiming saline soils is to convert agricultural land to industrial use
f. Acidification is responsible for formation of Sodic soil or alkali soil
g. Intensive tillage and low organic matter application leads to poor aggregation and soil crusting
h. The SAR value should ideally be less than <20 for safe irrigation.
i. Good soil tilth one of the key characteristics of healthy soil.
j. Leucaena leucocephala is a common MPT used in degraded lands for its nitrogen-fixing ability.

## PART – B

**Attempt *ANY FIVE* questions. All question carries equal marks** **(6 x 5 = 30 Marks)**

5. Discuss about the causes of soil compaction. Write down the detrimental effect of waterlogging.
6. Write down the land capability classes with table format mentioning the colour notation.
7. Define the soil acidity. Write down sources and control measures of soil acidity.
8. Briefly discuss the physical and chemical constraints of problematic soil
9. Explain the mechanism of phytoremediation with diagram.
10. Write down the types of water erosion. Elaborate the management practices of saline soil.

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