B.Tech Even Semester Examination, May, 2025

Agricultural Engineering

(4th Semester)

Course No: AGPC-254/AE-403

(Soil Science & Soil Mechanics)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

Note:

1. Attempt any five questions taking one from each unit.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

UNIT-I

1. (a) Write Short notes on: 8(1x8)

   i) Porosity ii) Void ratio

   iii) Tensiometer iv) Bulk Density

   v) Volumetric water content

   vi) Pedon vii) Soil Horizon

   viii) Soil Texture

   (b) Classify soil on the basis of Structure 6

2. (a) Expalin briefly about the formation of rocks. 4

   (b) Define Soil pedology 2

(c) .Classify different types of rocks based on their formation. 8

UNIT-II

3. (a) Derive the relation between void ratio and porosity. 5

(b) Differentiate between deep percolation and leaching. 4

(c) What will be the porosity of a soil sample whose void ratio is 0.35? Find the degree of saturation is G =2.7 & water content is 20% 5

4. (a) Briefly classify the different types of soil8

(b) Enumerate the different types of water held in soil pores 6

UNIT-III

5. (a) What are the different types of weathering? 3

(b) Enumerate the five main functions of Soil. 5

(c) Write a note on essential nutrient elements of soil. 6

6. (a) Discuss Soil profile with the help of a suitable diagram. 8

(b) For a soil that contains 15% clay, 65 % sand and 20 % silt. What will be the texture or textural class of the soil? 6

UNIT-IV

7. (a) Distinguish between soil texture and soil structure. 5

(b) Explain the Genesis and types of structure with the help of a labelled diagram 3

(c) Enlist the effects of Texture and structure on Porosity 6

8. (a) What do you mean by Nutrient Toxicities? 4

(b) How Nutrient Toxicities can be minimized? 5

(c) Write down the deficiency symptoms for any nutrients in soil. 5

UNIT-V

9. (a) Briefly explain the various factors affecting soil development. 6

(b) Enlist the important Subordinate Distinctions of soil horizon. 8

10. (a) Define Sufficiency range. 2

(b) Enumerate the different properties of soil colloid. 8

(c) What is Cation Exchange Capacity of soil? 2

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