

Five-Year Integrated M. Sc. Examination 2021-2022

Semester: V

Paper: EES-3-5-5

Subject: Principles of Soil Science

Time: 3 Hours

Full Marks: 40

Questions are of value as indicated in the margin

Answer question No. 1 and any four from the rest.

1. Write short notes on **any four** of the following. 4×2 = 8
 - a) Concept of Pedon
 - b) Regolith and Saprolite
 - c) Integrated Weathering Processes
 - d) Soil Skeleton and Plasma
 - e) Isomorphic Substitution for negative charge
 - f) Types and structures of Octahedron
 - g) Zero Point Charge

2. (a) What are the factors that affect foil formation?
(b) What ecosystem services we get from soil? 4+4 = 8

3. (a) What are the types of rocks? Give some example of them.
(b) What are chemical processes that contribute to the formation of clay minerals? 3+5 = 8

4. (a) What are the types and structure of silicon tetrahedron?
(b) Name some common primary minerals with their chemical formula.
(c) Why Illite is called non-expanding mineral? 2+4+2 = 8

5. (a) What is Humus? Describe types and properties of humified organic matter.
(b) Explain the theories of humus formation. (1+3)+4 = 8

6. (a) Define aerobic and anaerobic decomposition of organic matter.
(b) Explain the roles of microbes in Nitrogen Cycle. 2+6 = 8

7. (a) What is the difference between soil texture and soil structure?
(b) Elucidate types Soil Density and Porosity.
(c) You have given a Pycnometer of 25 ml. The weight of the Pycnometer is 5 gm and after filling with soil it is 50 gm. After pouring water into the Pycnometer up to draining, the weight became 55 gm. Calculate Bulk Density, Particle Density and Porosity of the given soil sample. [Consider the water has a density of 1 gm/cc] 2+3+3 = 8