

**M. Sc. 1<sup>st</sup> Year 2<sup>nd</sup> Semester Examination 2022**

**Geography**

**Soil Science and Biogeography**

**Course Code: SC/GEOG/PG/CORE/TH/08**

**Paper: GEOG-C108T**

**Time: 2 Hours**

**Full Marks: 50**

**Answer one question from each unit**

**UNIT-I: Pedogenic Processes and Forms**

1. What is meant by bombturbation? Why sesquioxide clays show low CEC? Prove that specific surface is inversely proportionate with the particle size in crystalline silicate clays. 3+3+4
2. A soil sample of 1 g was measured with 56.31 % of base saturation and CEC of 29.3 meq/ 100 g. Calculate the milliequivalent of bases and percentage of H<sup>+</sup> saturation of the soil sample. How does CEC help in cleansing the water percolating through a soil profile? Explain in brief the formation of black alkali soils. 3+3+4

**UNIT-II: Soils of Humid Tropics**

3. Elucidate the process of zonal soil formation in the hot and humid tropics. Mention different topographic signatures of this kind of zonal soil. 7+3
4. Differentiate humus from organic matter. Explain the role of organic matter in the profile development of podzol soil. 3+7

**UNIT-III: Dynamic Biogeography**

5. Distinguish between genetic diversity and species diversity. What are the salient environmental characteristics that lead to adaptive radiation of a parent species? Critically analyze the FTI model of plant succession as proposed by Connell and Slatyer (1977). 2+3+5
6. State the importance of K-T boundary in paleo-biogeographic studies. Mention the relationships between species population size, body size and its geographical range. 'The sixth mass extinction event is an ongoing process' – put arguments in favour of or against the statement. 3+4+3

**UNIT-IV: Spatial Dimensions in Biogeography**

7. Demonstrate with examples how the mechanism of dispersal accounts for species disjunction. Mention the Oriental Region according to Sclater-Wallace's faunal realms. Compare endemism with cosmopolitanism. 6+2+2
8. What is a multidimensional niche? How is Gloger's Rule related to crypsis? Narrate the establishment of biotic equilibrium on an island and its variation with island size and isolation. 2+2+6