M.Sc. (Ag.) Semester-II Examination 2017
Soil Science and Agricultural Chemistry
Course : SSC-501
(Soil Physics)

Time : 3 Hours **Full Marks : 50**

Questions are of value as indicated in the margin

Answer **any five** questions

1. (a) State and derive Stokes' law.
   (b) How will you obtain a completely dispersed system for mechanical analysis of a laterite soil?
   (c) How will you evaluate soil structure? 5+3+2=10
2. (a) What is soil consistency? Explain different forms of soil consistency with their practical reference to ploughings.
   (b) How compaction, compression and consolidation are interrelated?
   (c) How can you manage soil compaction? 5+3+2=10
3. (a) With the help of mass-volume relationship how does void ratio is related to total porosity and how does gravimetric moisture content is related to volumetric moisture content.
   (b) What is capillarity? Deduce the equation to measure the pore geometry (radius) from capillarity.
   (c) Define soil aggregation. How do various factors influence soil aggregate formation and stabilization? 3+3+4=10
4. (a) Device Darcy's equation. At what conditions Darcy's law is applicable?
   (b) What are the limitations of Darcy's law?
   (c) With the help of equation of continuity, express the equation of unsaturated flow under horizontal conditions. 3+3+4=10
5. (a) Describe the moisture profile during vertical infiltration.
   (b) Give a detailed account of the factors that control the rate of water infiltration in the soil.
   (c) Briefly describe the stages of evaporation. 3+3+4=10
6. (a) Describe heat conduction in soil under steady condition.
   (b) What are the factors that influence soil temperature?
   (c) How one can evaluate soil aeration status? 4+3+3=10
7. Write short notes on (**any five**) : 2×5=10
   (a) Poiseuille's law
   (b) Specific surface area
   (c) Soil plasticity
   (d) Soil water hysteresis
   (e) Grades of soil structure
   (f) Soil crusting
   (g) Soil tilth
   (h) zeta potential of soil system
