

M.Sc. (Ag.) Examination, 2015
Semester – II
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) Define specific surface of soil.
(b) Write down the principle of mechanical analysis by international pipette method.
(c) Describe stokes' law and its assumptions. 2+4+4=10
2. (a) Briefly discuss Atterberg's limits.
(b) How do different factors affect the formation of soil structure?
(c) Write down some indices for evaluating the stability of aggregates. 4+4+2=10
3. (a) Write down the principles of neutron moisture meter.
(b) Describe the functions of tensiometer and how it is used for measuring suction?
(c) Why the soil moisture content is more in desorption rather than absorption process in soil moisture characteristics curve? 4+4+2=10
4. (a) What are the defects of Darcy's law?
(b) From Darcy's law how one can derive an equation for horizontal as well as vertical flow of water in saturated soil?
(c) How one can measure hydraulic conductivity by constant head method? 3+4+3=10
5. (a) Explain soil moisture regimes within a soil profile during infiltration.
(b) Discuss various stages and various conditions necessary for soil evaporation.
(c) What is SPAC and how potentials of different components of SPAC systems are evaluated? 3+4+3=10
6. (a) Describe heat conduction in soil under both steady state and non-steady state conditions.
(b) How do soil moisture and compaction affect Thermal conductivity and diffusivity?
(c) How one can evaluate soil aeration status? 3+4+3=10
7. Write short notes on: (**any five**) 2×5=10
 - (a) Field water balance components
 - (b) Void ratio and degree of saturation

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(2)

- (c) Criteria for pressure and osmotic potentials
 - (d) Soil crusting
 - (e) Aggregate stability
 - (f) Radiation balance
 - (g) Specific heat & heat capacity of soils
 - (h) Saturated and unsaturated flow of water
8. (a) Write in brief about the mechanisms of renewal of soil air.
- (b) Discuss various soil moisture constants.
- (c) How do different factors affects saturated hydraulic conductivity in soil?

4+3+3=10
