

M.Sc.(Ag.) Examination, 2019
Semester-II
Soil Science and Agricultural Chemistry
Course- SSC-501
(Soil Physics)

Time: Three Hours

Full Mark: 50

Questions are of value as indicated in the margin

Answer *any five* questions.

1. (a) With the help of mass and volume of soil constituents deduce the relationship between grain metric and volumetric moisture content.
(b) State and derive stoke's Law.
(c) Define specific surface of soil and how it can be measured? 3+4+1+2=10
2. (a) "Granulation is flocculation plus...." Discuss critically this universal statement with appropriate supporting example.
(b) State the concept of swelling and mention the nature of forces involved in the swelling of soil.
(c) Write in detail about the factors that influence aggregate stability. 3+3+4=10
3. (a) Explain the different forms of soil consistency with pF value.
(b) Discuss the different components of soil water potential.
(c) Briefly discuss heat capacity and thermal conductivity of soil. 3+4+4=10
4. (a) Differentiate between saturated and unsaturated flow of soil water.
(b) State Darcy's law with equation. Write down its assumptions and limitations.
(c) Why is saturated hydraulic conductivity more but unsaturated hydraulic conductivity less in a sandy soil as compared to a clayey soil? 2+(2+4)+2=10
5. (a) How one can evaluate the aeration status of soils?
(b) What are the factors that influence soil temperature?
(c) Discuss various management practices for the optimization or modification of soil temperature. 3+3+4=10
6. Write short notes on (*any five*): 2×5=10
 - (a) Stoke's law
 - (b) Atterberg's limits
 - (c) Soil pudding
 - (d) Compaction and consolidation

(2)

- (e) Hysteresis
 - (f) Soil conditioners
 - (g) Soil crusting
 - (h) Philip's infiltration equations
7. (a) Compare the composition of soil air and atmospheric air.
- (b) How does gaseous inter charge take place in soil air.
- (c) Write the effects of puddling on soil physical properties.

2+4+4=10
