

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE  
SEMESTER END THEORY EXAMINATION

B.Sc.(Hons.) Agriculture

Semester	: 1 (New)	Term	: First	Academic Year	: 2024-25
Course No.	: SOIL-111	Title	: Fundamentals of Soil Science		
Credits	: 3(2+1)				
Day & Date	: Thursday, 06.02.2025	Time	: 10:00 to 13:00 hrs.	Total Marks	: 80

- Note :
1. Solve ANY EIGHT questions from SECTION 'A'.
  2. All questions from SECTION 'B' are compulsory.
  3. All questions carry equal marks.
  4. Draw neat diagram wherever necessary.

SECTION 'A'

- Q.1 a) Define Land capability classification. Explain non-arable sub-classes of land capability classification.  
b) How nutrient availability is affected due to soil reaction?
- Q.2 a) Define Soil Science. Elaborate various branches of Soil Science.  
b) Define Cation Exchange Capacity. Explain the mechanism of Cation Exchange Capacity.
- Q.3 a) What is Weathering? Explain chemical weathering of rocks.  
b) Enlist various fundamental soil forming processes. Explain any two of them.
- Q.4 a) Define Soil colloids. Give the general properties of soil colloids.  
b) Explain the term 'Phyllosilicate'. Draw the structure of Silica tetrahedron and Alumina-magnesia octahedron.
- Q.5 a) Give the physical soil water classification.  
b) What is Soil organic matter? Enlist various sources and factors affecting soil organic matter.
- Q.6 a) How gaseous exchange does take place between soil and atmosphere?  
b) Define Soil taxonomy. Enlist different soil orders.
- Q.7 a) Define Sedimentary rocks. Explain the types of sedimentary rocks.  
b) Explain the master soil horizons.
- Q.8 a) Give the factors affecting soil bulk density.  
b) Define Soil structure. Give the types of soil structure.
- Q.9 a) Write in brief about soil consistency.  
b) Explain the importance of soil temperature.
- Q.10 a) What are the different factors affecting soil water?  
b) Explain various types of soils of Maharashtra.

(P.T.O.)

## SECTION 'B'

Q.11 Fill in the blanks:

- 1) The water which lies between wilting coefficient and field capacity, is known as \_\_\_\_\_ water.
- 2) If  $H^+$  ion exceeds  $OH^-$  ion, then the solution is \_\_\_\_\_.
- 3) \_\_\_\_\_ is known as the 'Father of Soil Science'.
- 4) \_\_\_\_\_ is the study of soil from the stand point of higher plants.
- 5) \_\_\_\_\_ is the dominant spectral colour (rainbow) and is related to wavelength of light.
- 6) \_\_\_\_\_ horizon is comprised of organic horizon that forms above the mineral soil.
- 7) The formative element of vertisol soil order is \_\_\_\_\_.
- 8) In most of the mineral soils, the mean density of particle is \_\_\_\_\_  $mgm^{-3}$ .

Q.12 Do as directed:

- 1) Define: Sticky point moisture.
- 2) Give Jenney's universal soil loss equation.
- 3) Define: Soil survey.
- 4) Mention the size of silt particles as per United States Department of Agriculture (USDA) classification.
- 5) Give any one type of soil survey.
- 6) What is the characteristic of Juvenile stage of weathering?
- 7) Give the statement of Stock's law.
- 8) Give the ideal volume composition of mineral (inorganic) soil.

