



KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2021 Admission
IV Semester Final Examination – July 2023

Lwre.2205

Soil Mechanics (2+1)

Marks: 50
Time: 2 hours

- I Fill in the blanks (10x1=10)**
1. is the mass of solids per unit of total volume (prior to drying) of the soil mass.
 2. Specific gravity of soil is determined by density bottle and
 3. The logarithm of the negative pressure head in centimeters of water column height is known as
 4. The compactive energy given to the soil in Indian standard (IS) heavy compaction test is times higher than that of Indian standard (IS) light compaction test.
 5. The material retained or supported by the retaining wall is called which may have its top surface horizontal or inclined.
- State True or False**
6. Dispersed structure is an arrangement composed of particles having a 'face-to-face' or parallel orientation.
 7. The maximum shear stress is equal to one half the difference of the principal stress *i.e.* $\tau_{\max} = (\sigma_1 - \sigma_3)/2$.
 8. A body of soil is said to be in elastic equilibrium if every point of it is on the verge of failure.
 9. Slope failure is called as a face failure failure if the arc passes above the toe.
 10. As per I.S. grain size classification, the size of sand fraction is 0.075 – 4.75 mm.
- II Write short notes on ANY FIVE of the following (5x2=10)**
1. Describe honeycomb soil structure.
 2. Capillary soil water
 3. What is shear strength of soil and what are factors contributing shear strength of soil?
 4. What is coefficient of compressibility?
 5. What are methods of analysis for the stability of a finite slope?
 6. What is soil water hysteresis phenomenon?
 7. Write down advantages of Triaxial compression test.
- III Answer ANY FIVE of the following (5x4=20)**
1. What is soil plasticity and plasticity index?
 2. Draw and describe effective pressure distribution diagram for submerged soil mass.
 3. Compression index and expansion index
 4. Describe about modified Proctor test for soil compaction.
 5. Describe active earth pressure with Rankine's theory for dry or moist backfill (cohesionless) with no surcharge.
 6. Describe Taylor's stability number.
 7. Explain the optimum moisture content (OMC) for compaction in different type of soils.
- IV Write an essay on ANY ONE of the following (1x10=10)**
1. What is soil water permeability? What are factors affecting soil permeability and describe in details?
 2. What are principal soil stresses? Draw and describe the Mohr's circle of stress, pointing centre of circles and radius of circle, the origin of plane or pole.
