KERALA AGRICULTURAL UNIVERSITY
B.Tech (Agrl.Engg) 2014 Admission
IIIrd Semester Final Examination-January -2016

Cat. No: Lwre 2103   **Marks: 50.00**
Title: Geotechnical Engineering (2+1)   **Time: 2 hours**

I State True or False
                                                      (10 x 1=10)

1. Cohesive soils are usually plastic and incompressible

2. A cone penetrometer apparatus is useful for determining plastic limit

Fill up the blanks

3. Settlement at any time to final settlement in a clay is known as ....

4. The maximum inclination of an infinite slope in a cohesionless soil for stability is equal to the .... of the soil

5. The degree of firmness of a soil is denoted by its ....

6. Coefficient of uniformity of a well graded soil lies between ...... and ....

7. Flow and equipotential lines meet at each other at an angle equal to .... degrees

8. Define relative density

9. The pheratic line in an earth dam is .... in shape

10. Define plastic state of soil

II Answer any Five questions
                                                      (5 x 2=10)

1. What is the significance of Taylor's stability number?

2. What are the assumptions made in Boussinesq's formula for stress distribution in soils?

3. Differentiate between compaction and consolidation

4. Write short note on Mohr-coulomb failure theory

5. A saturated soil sample has a volume of 20 cm³ at its liquid limit. Given w_s= 42%, w_L=17% and G=2.74, find the minimum volume which the soil can attain

6. Define coefficient of compressibility

7. A consolidation test on a sample of clay having thickness of 2.3 cm indicates that half the ultimate compression occurs in the first 5 minutes. Under similar drainage conditions,how long will be required for a building on a 6m layer of the same clay to experience half of its final settlement? Neglect secondary time effect.

III Answer any Five questions
                                                      (5 x 4=20)

1. The mass specific gravity of a fully saturated specimen of clay having a water content of 40% is 1.88. On oven drying, the mass specific gravity drops to 1.74. Calculate the specific gravity of clay and its shrinkage limit

2. Discuss about the factors affecting the field compaction of soil

3. Write short note on the application of geotextiles

4. Write short note on coulomb wedge theory

5. Discuss briefly about Atterberg limits

6. Explain how you would determine the coefficient of permeability for a fine grained soil with low permeability in laboratory

7. A block of soil is 12 cm long and 6 sq.cm in cross section. The water level at one end of the block is 20 cm above a fixed plane, and at the other end it is 3 cm above the same plane. The flow rate is 2 cc per 1.5 min. Calculate the permeability

IV Answer any one question   (1 x 10=10

1. Discuss at length about the Modified Proctor Compaction Test

2. Discuss in detail about the constant head and variable head permeability test