KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg) 2013 Admission

III[rd] Semester Final Examination- December -2014

Cat. No: Lwre.2103 **Marks: 50.00**

Title:Geotechnical Engineering (2+1) **Time: 2 hours**

I Fill up the blanks/Define/State True or False (10 x 1=10)

1. The ratio of the volume of voids to the total volume of the given soil mass is known as _____
2. The void ratio of a soil whose porosity is 32% is_____
3. The maximum inclination of an infinite slope in a cohesionless soil for stability is equal to the _____of the soil
4. The lateral pressure exerted by the soil when the retaining wall tends to move away from the backfill is termed as _____
5. Failure of the stability of slopes ,generally occurs along _____surface
6. The maximum pressure which a soil can carry without shear failure is called _____
7. Define void ratio
8. Define relative density
9. Define shallow foundation
10. A soil with uniform gradation has a coefficient of uniformity less than 2.0

II Write short notes on any FIVE questions (5x 2=10)

1. What are the assumptions in Colomb's Wedge theory
2. Calculate active earth pressure and passive earth pressure by Rankine's formula for an angle of internal friction of 15^0
3. Differentiate translation failure and rotational failure
4. What is permeability. State the variables on which the permeability of a soil depends
5. What will be the void ratio of a given mass of soil ,if the water content is 0.20 ,specific gravity of soil particles is 2.7 and the degree of saturation of the soil is 75%
6. Write short note on particle size distribution
7. What is the significance of Direct shear test

III Write short notes on any FIVE questions (5x 4=20)

1. A soil sample whose water content is 20 % has a bulk density of 2.16 g/cc .The sample undergoes air drying with insignificant change in void ratio. What is the water content of this sample, when its bulk density is reduced to 2g/cc
2. Write short note on Swedish circle method
3. Describe the factors which affect the shear strength of cohesive soils

4. Discuss briefly about Rebhann's theory
5. Describe the Indian Standard classification of soils
6. A sample of sand above water table was found to have a natural moisture content 15% and a unit weight of 18.84 KN/m^3 .Lab tests on a dried sample indicated values of 0.5 and 0.85 for minimum and maximum void ratios, respectively for densest and loosest states. Calculate the degree of saturation and relative density
7. Discuss about the various types of geotextiles

IV Write an essay on any ONE **(1 x 10=10)**

1. Discuss in detail about the Terzaghi's theory of consolidation stating the assumptions and derive the relationship for estimating consolidation from first principles
2. Discuss in detail about the constant head and variable head permeability test

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