

Code No: R1622354

R16**SET - 1****II B. Tech II Semester Regular Examinations, April- 2018****SOIL MECHANICS**

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B****PART -A**

1. a) Define Void Ratio, degree of Saturation and porosity (3M)
- b) What do you understand by Geostatic Stresses (2M)
- c) Write the demerits of Triaxial Test (2M)
- d) Explain about Jodhpur Mini Compaction test (3M)
- e) Write about the assumptions of Terzaghis theory (2M)
- f) Write about the assumptions of Rankine's theory of earth pressure (2M)

PART -B

2. a) Define effective stress and importance of effective stress (4M)
- b) A soil profile consists of a surface layer of sand 3.5m thick ($\rho=1.65 \text{ mg/m}^3$), an intermediate layer of clay 2.5 m thick ($\rho=1.95 \text{ mg/m}^3$) and the bottom layer of gravel 3.5m thick ($\rho=1.925 \text{ mg/m}^3$). The water table is at the upper surface of the clay layer. Determine the effective stress at various levels immediately after placement of a surcharge load of 58.86 KN/m^2 to the ground surface. (10M)
3. a) State the assumptions made in computing stresses (4M)
- b) Derive an expression for the vertical stress at a point due to a point load using boussinesq's theory (10M)
4. a) What is mohr's circle? Discuss its importance characteristics (6M)
- b) A Sample of dry cohesionless soil was tested in a triaxial machine. If the angle of shearing resistance was 30° and the confining pressure of 100 KN/m^2 , determine the deviator stress at which the sample failed (8M)
5. a) Discuss about the factors affecting compaction (7M)
- b) A Sample of soil was prepared by mixing a quantity of dry soil with 10% by mass of water. Find the mass of this wet mixture required to produce a cylindrical compacted specimen of 17cm diameter and 14.5 cm deep and having 6% air content. Find void ratio and dry density of the specimen if G is 2.68 (7M)
6. a) Derive the equation for coefficient of consolidation (1D) (10M)
- b) Briefly explain the procedure of consolidation test (4M)

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7. a) Derive the expression for active and passive earth pressure with mohr's circle (7M)
- b) Determine the lateral earth pressure at rest per unit length of the wall of two layers each of 2m with top layer as 17 KN/m^3 unit weight and bottom layer 19 KN/m^3 saturated unit weight with ϕ is 30° (7M)

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