Printed Pages : 3

EAG402

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 180409

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

SOIL MECHANICS

Time : **3** Hours] [Total Marks : **100**

Note : Attempt each section.

SECTION –A

1 Attempt each short answer type questions. **10×2=20**

(a) Define soil mechanics. What do you understand by density of soil?

(b) List the field of soil mechanics.

(c) For what type of uses a "new mark influence – chart" is used?

(d) What do you mean by shear strength of soil?

(e) Define "Compaction of soils". Where compaction is essential?

(f) Is the compaction of soil by tractor rear wheel affect the germination of seeds?

(g) What is co – efficient of consolidation?

(h) Define "void ratio". How it is a important factor in the field of agricultural growth?

(i) What do you understand by "Taylor's stability number"?

(j) Differentiate between cohesive and non cohesive soils with examples.

SECTION – B

2 Attempt any three parts of the following : **10×3=30**

(a) Explain the I.S. Soil classification. Also draw a phase diagram.

(b) Discuss the Mohr – coulomb failure theory.

(c) Differentiate between standard and modified proctor test.

(d) What are the methods to calculate the "void ratio"? Is the coefficient of volume change depend on void ratio?

(e) Derive the "Passive earth pressure" of cohesive soils.

SECTION – C

3 Attempt all parts of the following : **10×5=50**

(a) A clay sample has a void ratio of 0.53 in dry state. What will be the shrinkage limit if G = 2.70?

OR

A soil has a bulk unit weight of 20.11 kN/m^2 and water content of 15%. Calculate the water content if the soil partially dries to a unit weight of 19.42 kN/m^3 and the void ratio remains unchanged.

(b) Discuss the Bousinesque's analysis for concentrated force.

OR

A rectangular area 2m × 4m carries a uniform load of 80 kN/m^2 at the ground surface; Find the vertical pressure at 5m below the centre and the corner of loaded area.

(c) Describe the factor affecting on consolidation.

OR

With the help of sketch explain the water density relationship in very much essential for standard proctor test.

(d) An unsaturated sample of clay stratum, 2m thick was tested in the laboratory and the average value of coefficient of consolidation was found to be 2×10^{-4} cm^2/sec. If the structure is build on the clay stratum, how long will it take to attain half the ultimate settlement under the load of structure? Assume double drainage.

OR

Discuss the Taylor's method of consolidation.

(e) Compute the intensities of active and passive earth pressure at depth of 8m in dry cohesion less sand with an angle of internal friction of 30° and unit weight of 18 kN/m^3 What will be the intensities of active and passive earth pressure if the water level rises to the ground level? Take saturated unit weight of sand as 22 kN/m^3.

OR

Discuss the stability analysis of finite slopes?