Printed Pages : 3

AG-402

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

PAPER ID : 180414

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15
SOIL MECHANICS

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

Note: Attempt each section. Assume data whenever necessary. The use of calculator is permitted.

SECTION-A

1   Attempt each short answer type questions.   10×2=20
   (a)   How will you find the bulk density of soil?
   (b)   Give a general classification of soil based on particle size?
   (c)   What do you mean by shear strength of soil?
   (d)   For what purpose the new mark influence chart is used?
   (e)   List any four field compaction method alongwith their applicability?
   (f)   Why the field germination is affected by the compaction of tractor wheels?
   (g)   Differentiate between compaction and consolidation.

(h)   What is a "shrinkage limit"?Give the properties of soil on which it depends.

(i)   What do you mean by earth pressure?

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

SECTION-B

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

(a)   Discuss the "Terzaghi's theory" of consolidation.

(b)   Derive the "Active earth pressure" of soil.

(c)   Explain the "Jodhpur mini compaction test"? Is it superior then Abbot Compaction?

(d)   What do you mean by index properties of soils? Is it differing from the physical properties of soil

(e)   Sketch and explain the Mohr's stress circle to find shear strength of soil?

SECTION-C

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

(a)   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?

(b) Compute the intensities of active and passive earth pressure at depth of 8m in dry cohesionless 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 infinite slopes.

(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) 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

(e) 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.

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