Printed Pages: 4 | 689/676 | NCE-501/ECE-501

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

Paper ID : 100501/100511 | Roll No. | | | | | | | | | |

B.Tech.

(SEM. V) THEORY EXAMINATION, 2015-16

GEOTECHNICAL ENGINEERING

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

SECTION-A

Attempt **all** parts. All parts carry equal marks. Write answer of each part in short. (2x10=20)

(1) What is Muck?

(2) Briefly explain single grain structure.

(3) Draw pressure distribution diagram for submerged soil mass.

(4) What is weight of hammer, height of drop, number of layers as per IS - 2720 part VIII in heavy compaction test?

(5) What is the recommendation of U.S. Army corps for protective filters.

(6) Explain in brief about stress isobar or isobar diagram.

(7) Define coefficient of compressibility.

(8) What are the limitation of Rankine Theory?

(9) What is platen or end effect in shearing strength?

(10) What is inside & outside clearance in soil exploration?

SECTION-B

Attempt **any five** parts of the following. All partscarry equal marks. (10x5=50)

1. What are the limitations in the use of stokes law in Sedimentation Analysis.

2. A bed of sand consist of three horizontal layers of equal thickness. The magnitued of the coefficient of permeability for both the upper and lower layer is $4x10^{-4}$ mm/s and for middle layer is $6x10^{-2}$ mm/sec. What is the ratio of average permeability of bed in horizontal direction to that in vertical direction.

3. What is piping in hydraulic structure? Suggest same remedial measure to check or prevent it.

4. A concentrated load 10kN acts on the surface of a soil mass. Using Boussinesq analysis find the vertical stress at points(i) 3m below the surface on the axis of loading and (ii) at radial distance of 2 m from axis of loading & at depth of 3m.

5. A soil sample 20mm thick takes 20 min. to reach 20% consolidation. Find the time taken for a clay layer 6m. thick to reach 40% consolidation. Assume double drainage in both cases.

6. What are the advantages & disadvantages of triaxial compression test.

7. Using the Rankine theory, determine the total active thrust on a vertical retaining wall 10 m high if the soil retained has the following properties $\phi = 35^0; \gamma = 19kN/m^3$

   What is the increase in horizontal thrust if the soil slopes up from the top of the wall at an angle of 35^0 to the horizontal.

8. Explain SPT test? Also explain the corrections used for the test.

SECTION-C

Attempt **any two** parts of the following. All parts carry equal marks. (15x2=30)

1. A natural soil deposit has bulk unit weight of 18.5 kN/m^3 and water content of 5%. Calculate the amount of water required to be added to $5m^3$ of soil to raise the water content to 14%. Assume the void ratio to remain constant. Also find degree of saturation, assume G=2.65

2. What are the Skempton's pore pressure parameters? Derive an expression between pore water pressure and applied stress.

3. Explain field methods to determine Permeability.

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