

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.TECH
BRANCH: CIVIL

SEMESTER : I
SESSION : MO/19

SUBJECT: CE515 ADVANCED SOIL MECHANICS

TIME:3:00 HOURS

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) The thickness of the diffused double layer varies in accordance with the environment. Explain to justify. [5]
Q.1(b) Write a note on SEM. [5]
- Q.2(a) State & elaborate the factors affecting soil suction. [5]
Q.2(b) Explain any two different methods of soil suction measurement. [5]
- Q.3(a) Demonstrate to explain the stress path in an un-drained tri-axial test as obtained in different spaces. [5]
Q.3(b) Discuss on the choice of shear parameters for design. [5]
- Q.4(a) Illustrate the development of the Roscoe surface. [5]
Q.4(b) The values of soil constants for a clay $N = 3.25$, $\lambda = 0.20$, $\Gamma = 3.16$ & $M = 0.94$. A sample of clay is isotropically normally consolidated to 400 kN/m^2 , where $v_o = 2.052$, & is then subjected to a standard drained compression test. Calculate the values of q' , p' , v & ε_v at failure. [5]
- Q.5(a) Appraise the essential features of yielding, hardening & flow to comprehend the concept of the theory of plasticity. [5]
Q.5(b) Derive $\delta\varepsilon_s = [2\kappa(1 + v')]\delta q' / (9vp'(1 - 2v'))$, symbols having their standard significance. [5]

::::::02/12/2019::::::E