Roll No.

Total No. of Questions : 08

Total No. of Pages : 02

## M.Tech. (Civil Engineering) (Geotechnical Engineering) (Sem.–1) ADVANCED SOIL MECHANICS Subject Code : MTGT101-18 M.Code : 93269 Date of Examination : 19-01-23

## Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES : 1.Attempt any FIVE questions out of EIGHT questions. 2.Each question carries TWELVE marks.

- 1. a) Give the Difference between NCC and OCC.
  - b) A stratum of soil 4m thick lies above an impervious stratum. It has a void ratio of 1.5 at an initial pressure of 150kN/m<sup>2</sup>.
    - i) compute the change in void ratio to an increase of 50kN/m<sup>2</sup>. Take Cc= 0.20.
    - ii) Also calculate the final settlement of the soil stratum due to above increase in stress,
    - iii) What would be time required for 50% consolidation? Take Tv = 0.20 and  $k = 3 \times 10^{-4}$  cm/sec.
- 2. Discuss method of Taylor's curve fitting method for finding coefficient of consolidation from lab test data.
- 3. a) How Triaxial tests for differs for drainage conditions in details with their application related to field.
  - b) What are Pore Pressure Parameters?
- 4. a) Sketch the stress strain graphs for sands from Triaxial test results.
  - b) Do Liquefaction is influenced by shear strength of soil? Elaborate.

5. Given the following triaxial test data, plot the results in a Mohr Circle diagram and determine  $\phi$ .

$\sigma 3 (kN/m)^2$	Peak al (kN/m <sup>2</sup> )	$\sigma 3 (kN/m^2)$	Peak $\sigma l (kN/m^2)$
69	190	276	759
138	376	345	959
207	580	414	1143

- 6. a) Write note on Stress Paths showing its significance.
  - b) For a saturated clay soil the following are the results of some CD test

Test No.	$p' = (\sigma l + \sigma 3)/2$ (kN/m <sup>2</sup> )	$q' = (\sigma l - \sigma 3)/2$ (kN/m <sup>2</sup> )
1	450	185.1
2	650	265.1
3	750	305
4	1260	465

Draw p' versus q' diagram and from that find shear strength parameters.

- 7. a) Explain mechanism of Critical state soil mechanics for NCC and OCC?
  - b) Discuss Critical void ratio and its effects on volume change behavior.
- 8. a) Write the note on occurrence of dilation in sands.
  - b) What is yielding and Hardening phenomenon in Soils?

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.