

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Winter 2018 - 19 Examination

Semester: 1**Subject Code: 203215102****Subject Name: Advanced Soil Mechanics****Date: 11/12/2018****Time: 10:30am to 1:00pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1(A)** Explain stress path for different types of triaxial test including Unconfined Compression Test (10)
- Q.1(B)** Explain Critical Void Ratio (05)
- Q.2** Answer the following questions. (Attempt any three) (Each five mark) (15)
- (A)** An undisturbed sample of clay, 24 mm thick, consolidated 50% in 20 minutes, when tested in laboratory with drainage allowed at top and bottom. The clay layer, from which sample was obtained is 4 m thick in field. How much time will it take to consolidate 50%, with double drainage? If the clay stratum has only single drainage, calculate the time to consolidate 50%. Assume uniform distribution of consolidation pressure.
- (B)** What are the uses of models in Engineering
- (C)** The test was conducted on soil sample and following results were obtained
Cell Pressure (KN/m²) : 100, 200, 300
Deviator Stress (KN/m²) : 65, 132, 200
Determine shear strength parameters w.r.t total stress
- (D)** State types of Triaxial tests and explain in brief.
- Q.3 (A)** The stress at failure on failure plane in cohesionless soil mass are : Normal Stress = 10 KN/m² & shear stress = 4kN/m². Determine resultant stress on failure plane, angle of internal friction, Angle of Inclination of failure plane to the major principal plane. Also determine it graphically. (07)
- Q.3 (B)** Explain Spring Analogy of Consolidation in detail (08)
- OR**
- Q.3(B)** A direct shear box test is performed for sandy soil in an undrained condition and normal stress was kept at 250 kN/m². The angle of shearing resistance was observed to be 32°. Calculate (1) Undrained shear strength (ii) Plot a Mohr Circle determine magnitude of principal stress and their orientations. (08)
- Q.4 (A)** Explain procedure of triaxial test with neat sketch (07)
- OR**
- Q.4 (A)** Explain Critical State Concept in brief (07)
- Q.4 (B)** Explain Mohr Columb Strength theory in detail (08)