Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 150604   **Date: 20-05-2013**

Subject Name: Geotechnical Engineering I

Time: 10.30 am - 01.00 pm   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain ठGeotechnical Cycleठ and type of soil based on its formation.	**07**
	(b)	Explain unit solids volume phase diagram with its utility.	**07**
Q.2	**(a)**	A laboratory sample of clay 2cm in thickness took 6 hrs. to attain 60% consolidation under double drainage condition. What time will it take to experience the same degree of consolidation for a building built on 3m thick layer of same clay under single drainage?	**07**
	(b)	What is consolidation of soil? Give difference between compaction and consolidation.	**07**

OR

	(b)	Give laboratory method to determine coefficient of consolidation.	**07**
Q.3	**(a)**	Which factors affect coefficient of permeability? Explain in detail.	**07**
	(b)	A highway embankment is to be compacted to 95% of the standard proctor density. The dry density of a borrow material exactly adjacent to the site is 18.4 kN/m^3 at 100% compaction. Gs = 2.65. How much borrow soil in cu m. will be required to compact 1 cu m. of embankment?	**07**

OR

Q.3	**(a)**	Explain factors affecting compaction of soil.	**07**
	(b)	Determine effective and neutral stresses at a depth of 15 m below the ground surface for the following condition: Water table 3.0m below ground surface, Gs = 2.65, e = 0.7, average moisture content = 5%.	**07**
Q.4	**(a)**	How will you get shear strength parameters of soil? Give limitations of Box Shear Test.	**07**
	(b)	Compute the shearing strength of soil along a horizontal plane at a depth of 5 m in a deposit of sand having ϕ = 36°, γ_d = 16.68 kN/m^3 Gs = 2.7. Assume water table at 2.4 m from ground level.	**07**

OR

Q.4	**(a)**	Give shear tests based on drainage condition with its practical utility.	**07**
Q.4	**(b)**	In an Unconfind compression test, a cylindrical sample of sandy clay 8 cm long and 4 cm in dia, fails under a load of 80N evaluate shearing resistance if failure occurs at 10% strain.	**07**
Q.5	**(a)**	How soil is classified based on its Texture?	**07**
	(b)	Define atterbergøs limits and related indices.	**07**

OR

Q.5	**(a)**	Which different types of structures are possible in soil? Give characteristics of soil having different structure.	**07**
	(b)	Give different types of water in soil.	**07**

****

1