Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code:X40603 **Date:23/12/2015**

Subject Name: Soil Engineering

Time: 02:30pm to 05:00pm **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)** Define "Compaction"? Explain different types of compaction test available in the laboratory? **07**

(b) Explain the phenomenon of consolidation and explain "Pre Consolidation Pressure"? **07**

Q.2 **(a)** Explain Newmark's influence chart with help of a neat sketch? **07**

(b) Draw stress distribution curves for various depths for soil subjected to a rectangular distributed load. **07**

OR

(b) Differentiate between Boussinesq's and Westergaurd's theory for stress distribution. **07**

Q.3 **(a)** Explain Mohr and Mohr Coulomb theory with respect to shear strength of soil? **07**

(b) A consolidated undrained triaxial test was performed on a specimen of saturated clay with a cell pressure of 2 kg/cm^2. At failure, the value of deviator stress is 2.8kg/cm^2 and the pore water pressure is 1.8kg/cm^2 with a failure plane angle of 57^0. Calculate the normal stress, shear stress on the failure surface and maximum shear stress on the specimen. **07**

OR

Q.3 **(a)** Explain various types of shear test performed in lab. Explain any one in detail. **07**

(b) Discuss about earth pressure at rest. What is active and passive earth pressure? **07**

Q.4 **(a)** Explain various factors affecting compaction of soil? **07**

(b) A standard compaction test is performed on soil with G = 2.65, with mould volume of 1000cc, using the readings given below find the maximum dry density and optimum moisture content for the soil. The empty weight of the mould is 2450gms **07**

Wt. of Mould + Soil	4013	4111	4187	4253	4287	4229	4207
Water Content	6	8	10	12	14	16	18

OR

Q.4 **(a)** Explain with help of a neat sketch method for determination of coefficient of consolidation using square root of time fitting method? **07**

(b) Explain theory of spring analogy for one dimensional consolidation? **07**

Q.5 **(a)** Explain Friction circle method of slope stability analysis? **07**

(b) A cantilever retaining wall of 7m height retains sand with e = 0.5, ϕ=30, G = 2.7. Using Rankine's theory to determine the active earth pressure at the base with the backfill in (i) dry and (ii) submerged conditions. **07**

OR

Q.5	**(a)**	Mention different methods of stability analysis of finite slopes? Explain any one in detail with help of neat sketches?	**07**
	(b)	Describe the Culmann's graphical method to evaluate active thrust.	**07**

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