Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: X40603 **Date: 29/12/2012**

Subject Name: Soil Engineering

Time: 02.30 pm - 05.00 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 factors affecting compaction. 07

(b) The following are the results from a standard compaction test on a soil sample. 07

Water content %	12	14	16	18	20	22
Mass of wet soil (kg)	1.68	1.85	1.91	1.87	1.87	1.85

The volume of the mould is 950 ml. Plot compaction curve and obtain MDD and OMC.

Q.2 (a) Explain Modified Mohr-coulombs theory. 07

(b) Two identical specimens were tested in a tri-axial test apparatus, first sample was failed at a deviator stress of 750 kN/m^2 at a confining pressure of 250 kN/m^2. While second specimen fails a total vertical stress of 1600 kN/m^2 at a confining pressure of 400 kN/m^2. Find the shear parameters. 07

OR

(b) Write merits of tri-axial test. 07

Q.3 (a) A concentrated load of 2000 kN is applied at the ground surface. Determine the vertical stress at a point which is at a depth 6 m directly below the load. Also calculate the vertical stress at a point which is at a depth 6 m but at a horizontal distance of 5 m from the axis of the load. 07

(b) Draw stress distribution curve for various depth for the soil subjected by a point load. Also draw the curve for r = 0 condition. 07

OR

Q.3 (a) Derive equation for vertical stress for the soil subjected by a strip load. 07

(b) Give assumptions made in Boussinesq's theory. 07

Q.4 (a) Explain spring analogy theory for primary consolidation of any soil sample. 07

(b) Enlist assumptions made in Terzaghi's one dimensional consolidation theory. 07

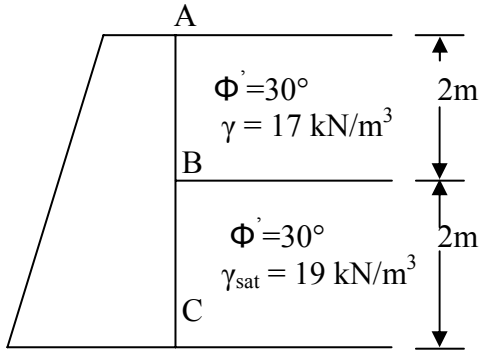
OR

Q.4 (a) Enlist the method determination of coefficient of consolidation and explain any one in detail. 07

(b) The laboratory consolidation data for an undisturbed clay sample are as follows 07
e1= 1.00 , σ = 85 kN/m^2 and e2 = 0.80 , σ = 465 kN/m^2 determine the void ratio for a pressure σ = 600 kN/m^2.

Q.5 (a) Give assumptions made in Rankine's earth pressure theory and derive equation for k_a. 07

(b) Determine the lateral earth pressure at rest per unit length of the wall shown in figure. Also determine the location of th resultant earth pressure. Take $K_0 = 1 - \sin\Phi'$ and $\gamma_w = 10\ kN/m^3$ 07



OR

Q.5 (a) Explain types of slope failure. 07

(b) Explain swidish circle method. 07

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