

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:2150609****Date:29/01/2021****Subject Name:Soil Mechanics****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) Define compaction, consolidation and optimum moisture content.	03
(b) Enlist factors affecting compaction.	04
(c) Discuss spring analogy model for primary consolidation.	07
Q.2 (a) Define compression index, coefficient of compressibility and degree of consolidation.	03
(b) Discuss determination of pre-consolidation pressure method.	04
(c) Explain the procedure of standard proctor test with figure.	07
Q.3 (a) Draw coulomb's failure envelope for cohesive soil, friction soil and cohesive-friction soil.	03
(b) Discuss merits and demerits of Triaxial test.	04
(c) A cylindrical specimen of soil having cohesion 0.8kg/cm^2 and angle of internal friction of 20° , is subjected to cell pressure of 1.0kg/cm^2 . Calculate the maximum deviator stress at which the sample will fail and the angle made by failure plane with the axis of the sample.	07
Q.4 (a) Draw different types of failure of a soil sample in Triaxial compression test.	03
(b) Differentiate between direct shear test and Triaxial test.	04
(c) An unconfined compression test was performed on an undisturbed clay sample. The sample had a diameter of 38mm and length 76mm. The load at failure was 30N and axial compression of sample was 11mm. compute the undrained shear strength parameter if the failure plane makes an angle 50° with horizontal.	07
Q.5 (a) Define retaining wall, backfill and surcharge.	03
(b) Differentiate between active earth pressure and passive earth pressure.	04
(c) Describe culmann's graphical method for active earth pressure.	07
Q.6 (a) Define active earth pressure, passive earth pressure and earth pressure at rest.	03
(b) Calculate the height of unsupported vertical cut for a cohesive soil having undrained cohesion 11kN/m^2 . Consider unit weight of soil 18kN/m^3 .	04
(c) A retaining wall 6m high with vertical back supports cohesive soil backfill having unit weight 19kN/m^3 . Calculate internal pressure intensity at top, depth of tension crack and lateral pressure intensity at the base. Consider $C = 20\text{kN/m}^2$.	07

- Q.7**
- (a) Enlist theories regarding distribution of stresses in soil. **03**
 - (b) Discuss the limitations of Boussinesq's solution. **04**
 - (c) Compute vertical stress at 2m depth for a point load of 150kN along axis using Boussinesq's and Westergard's theory. **07**
- Q.8**
- (a) Draw contact pressure diagram for flexible and rigid footing in saturated clay and sand. **03**
 - (b) Illustrate the procedure for plotting an isobar of intensity $0.1Q$. **04**
 - (c) Discuss the factors affecting the selection of type of foundations. **07**

www.FirstRanker.com