

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- V (New) EXAMINATION – WINTER 2019****Subject Code: 2150609****Date: 29/11/2019****Subject Name: Soil Mechanics****Time: 10:30 AM TO 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.

		MARKS
Q.1	(a) What are the different types of earth pressure? Give examples.	03
	(b) Explain different types of slope failure.	04
	(c) Give the steps in choosing type of foundation.	07
Q.2	(a) Write down short note on 'Earth Pressure at Rest'.	03
	(b) Explain Rankine theory for passive earth pressure in cohesive soil.	04
	(c) Explain Rebhann's graphical method for active earth pressure.	07
	OR	
	(c) A smooth vertical wall 5 m high, retains $C = 2.5 \text{ N/cm}^2$ with an angle of internal friction of 30° and unit wt of 18 KN/m^3 . Show the Rankine passive pressure distribution and determine the magnitude and point of application of the passive pressure.	07
Q.3	(a) What do you understand by geostatic stresses?	03
	(b) Explain the concept of pressure bulb.	04
	(c) Derive an expression for the vertical stress due to a line load.	07
	OR	
Q.3	(a) Explain influence diagram & its uses.	03
	(b) A water tank is supported by a ring foundation having outer diameter of 10 m and inner diameter of 7.5 m. the ring foundation transmits uniform load intensity of 160 KN/m^2 . Compute the vertical stress at a depth of 4 m at the centre using Boussinesq analysis.	04
	(c) Derive an expression for vertical stress under a point load.	07
Q.4	(a) Define (i) Optimum moisture content (ii) Maximum dry density.	03
	(b) Explain different types of factor of safety used in the stability analysis of slopes.	04
	(c) The maximum dry density of a sample by the light compaction test is 1.78 gm/cm^3 at an optimum moisture content of 15%. Find the degree of saturation and air voids $G=2.67$. What would be the corresponding value of dry density on the zero air void lines at OMC?	07
	OR	
Q.4	(a) Explain different method of compaction.	03
	(b) Find the factor of safety of a slope of infinite extent having angle of slope 25° . The slope is made of cohesion less soil with $\phi = 30^\circ$.	04
	(c) Describe standard proctor compaction test with its specification.	07
Q.5	(a) Explain limitations of direct shear test.	03
	(b) Explain laboratory unconfined compression test for soil.	04
	(c) During consolidation test, the void ratio decreases from 0.70 to 0.65 under the stress increment of 50 KN/m^2 to 100 KN/m^2 . Compute coefficient of volume compressibility and compression index.	07
	OR	
Q.5	(a) Differentiate between consolidation & compaction.	03
	(b) Explain briefly Vane shear test of soil.	04

- (c) An unconfined compression test was conducted on an undisturbed clay sample. The sample had a diameter of 38 mm and length 76 mm. the load at failure was 30 N and axial compression of the sample was 11 mm. determine the undrained shear strength parameters if the failure plane makes an angle 50° with horizontal.

www.FirstRanker.com