Seat No: _____

Enrollment No: __ PARUL UNIVERSITY FACULTY OF ENGINEERING & TECHNOLOGY B.Tech. Summer 2018 – 19 Examination

Semester: 4 Subject Code: 03110251 Subject Name: Soil Mechanics

Date: 29/04/2019 Time: 2.00 pm To 4.30 pm Total Marks: 60

Instructions:

- 1. All questions are compulsory.
- 2. Figures to the right indicate full marks.
- 3. Make suitable assumptions wherever necessary.
- 4. Start new question on new page.

Q.1	Objective Type Questions - All are compulsory and each is of one mark. (Options are given for first five)	(15)
1.	Primary compression is mainly due to expulsion of (Air, Water, Both air and water, None)	
2.	The units of Specific gravity is a) cm/sec b) cm ² /sec c) cm/sec ² d) no units	
3.	Degree of saturation for fully dry soil is	
	(0, 1, 0.5, 0.25)	
4.	Effective stress is	
	(Total normal stress – Pore water pressure, Total normal stress – Deviator stress, Total normal stress – major principle stress)	
5	The direction of failure plane in Direct shear box test is	
	(Horizontal, Vertical, At an angle, Anywhere)	
6	Ratio of Volume of air void to volume of void is termed as	
7	Relationship between void ratio and porosity is given as	
8	The diameter of a core cutter in core cutter method for in situ density ismm.	
9	number of blows are applied per each layer in standard proctor test.	
10	Oven drying method is a method for the determination of of a soil sample.	
11	To find out OMC and max dry density for air field/ airport runway,type of Proctor test should carried out.	

- 12 Direct shear test is also called as _____
- 13 If D60 is 9.6mm, D30 is 2mm and D10 is 0.16mm, what is the value of Cu (Uniformity coefficient)?
- 14 ______of a soil is the ratio of Plasticity Index to the Flow index of a soil.
- 15 Casagrande apparatus is used to determine _____limit of soil sample in laboratory.

Q.2	Answer the following questions. (Attempt any three)	(15)
(a)	Draw 3 phase diagram and derive	5
	$y_b = y_w(G + eSr) / (1+e)$	
(b)	Differentiate Standard Proctor test from modified Proctor test	5
(c)	Differentiate Compaction and Consolidation	5
(d)	Describe IS classification system of Soil.	5
Q.3	Answer the following questions.(Attempt any two but (a) is compulsory)	(15)
(a)	Write down assumption considered in Boussinesq analysis. Write Boussinesq equation for finding out the vertical stress under a single concentrated load.	7
(b)	Explain Core cutter method to find field density of soil.	8
	OR	
(b)	What is earth pressure? Explain three types of earth pressure and coefficient of earth pressure.	8
Q.4	Answer the following questions.(Attempt any two but (b) is compulsory)	(15)
(a)	A sample of sand above water table was found to have a natural water content of 18% and a unit weight of 18.75 kN/m ³ . Laboratory tests on a dried sample indicated values of 0.5 and 0.85 for minimum and maximum void ratios respectively, for densest and loosest states. Calculate the degree of saturation and relative density. Assume $G=2.65$.	7

OR

- (a) For a construction project, a site is selected where geotechnical exploration reveals that first layer 7 from surface is graded soil of unit weight 24 KN/m³ and it is upto 2.8 m. It is underlain by 2 m thick silty clay of unit weight 19 KN/m³ and further there is 2 m layer of gravel of unit weight 20 KN/m³. The water table is at the surface of silty clay. Draw the total stress, Pore pressure and effective stress diagram and also show the value of each at bottom of silty clay andat the bottom of gravel layer.
- (b) Explain the one dimensional consolidation theory with Terzaghi's spring analogy concept for different drainage conditions