Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER • 2014

Subject Code: 2130606 **Date: 01-01-2015**

Subject Name: Geotechnics and Applied Geology

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)**	What is the scope of geotechnical engineering in the field of civil engineering?	**07**
	(b)	What is weathering? Enumerate the type of weathering. Distinguish between physical and chemical weathering.	**07**
Q.2	**(a)**	A soil sample has a porosity of 40 percent. The specific gravity of solids is 2.70. Calculate (a) void ratio, (b) dry density, (c) unit weight if the soil is 50% saturated and (d) unit weight if the soil is completely saturated.	**07**
	(b)	What is an earthquake? What are the causes of earthquakes? Describe in brief the types of earthquake waves.	**07**
		OR	
	(b)	How is geology related to civil engineering? Discuss the scope of application of geological knowledge in the planning and execution of engineering works.	**07**
Q.3	**(a)**	Define the following terms: (i) water content (ii) void ratio (iii) porosity (iv) Unit weight of solids (v) Air content (vi) Bulk Unit weight (vii)Specific gravity	**07**
	(b)	Discus in brief the importance of study of geology for a civil engineer.	**07**
		OR	
Q.3	**(a)**	A soil sample has a liquid limit of 30%, plastic limit 17% and flow index of 13%. Natural water content of soil is 19%. Determine: (i) plasticity index (ii) liquidity index (iii) consistency index(iv) Toughness index	**07**
	(b)	Define laws of stratigraphy.	**07**
Q.4	**(a)**	Enlist the various methods of water content determine and explain oven drying method.	**07**
	(b)	Define the terms: (i) permeability (ii) seepage (iii)coefficient of permeability(iv)Darcy's law (v) flow net(vi) Discharge velocity(vii)Hydraulic gradient(i)	**07**
		OR	
Q.4	**(a)**	Define a mineral describe in brief the various physical properties of minerals which help in their identification.	**07**
	(b)	Explain grain size distribution by sieve analysis.	**07**
Q.5	**(a)**	What are faults? How they are classified? Illustrate with neat and suitable diagram.	**07**
	(b)	What is texture of the soil?	**07**
		OR	
Q.5	**(a)**	What are the purposes of the soil classification?	**07**
	(b)	Write short notes on the following: (i) water table and perched water table (ii) confined aquifer and unconfined aquifer	**07**

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