Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2130606 Date:09/01/2017

Subject Name:Geotechnics & Applied Geology

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.**

Q.1		**Short Questions**	**14**
	1	The soil transported by water is called _____.	
	2	Define the term: Degree of saturation	
	3	If the void ratio of a soil sample is 20%, the porosity is _____.	
	4	What is the value of plasticity index for a sandy soil?	
	5	A soil having particles of nearly same size is called _____	
	6	In IS soil classification system, what is the symbol for well graded sand?	
	7	Which corrections are applied in hydrometer analysis?	
	8	Which clay mineral has the maximum swelling property?	
	9	For which type of soil, falling head permeability test is performed?	
	10	Define the term: Cleavage.	
	11	Which mineral has the minimum and maximum hardness on a Mohr's scale?	
	12	Define the epicenter of an earth quake.	
	13	Define the term : Run off.	
	14	What are the side effects of an earth quake?	
Q.2	**(a)**	The porosity of a soil sample is 35% . Calculate its void ratio, dry density, saturated density and submerged density. Take G = 2.7.	**03**
	(b)	Explain grain size distribution by sieve analysis.	**04**
	(c)	Describe various factors affecting permeability of a soil mass.	**07**
		OR	
	(c)	Describe the different types of soil structure in detail.	**07**
Q.3	**(a)**	What is a quick sand? Explain the meaning of critical hydraulic gradient.	**03**
	(b)	Explain total stress, effective stress and neutral stress.	**04**
	(c)	Explain the characteristics of flow net with any two applications.	**07**
		OR	
Q.3	**(a)**	Derive the functional relationship between bulk density, dry density and moisture content, $\gamma d = \gamma / 1+w$,	**03**
	(b)	Write a short note on the adsorbed water.	**04**
	(c)	Calculate the plasticity index, liquidity index and consistency index of a soil mass for a given data. Natural water content : 50%, Liquid limit : 55%, Plastic limit 25%. What would be the type of soil on a plasticity chart?	**07**
Q.4	**(a)**	What is the importance of geology for civil engineering?	**03**
	(b)	Explain the agents which are responsible for metamorphic changes.	**04**
	(c)	Enlist the different engineering properties of rocks and explain them.	**07**
		OR	

Q.4	**(a)**	Define and explain the process of chemical weathering.	**03**
	(b)	Write a short note on seismic zoning of India.	**04**
	(c)	Explain different laws of stratigraphy.	**07**
Q.5	**(a)**	Write a short note on types of land slides.	**03**
	(b)	Explain uses of minerals.	**04**
	(c)	What are the application of remote sensing in geological investigation?	**07**

OR

Q.5	**(a)**	Explain hydrological cycle with figure.	**03**
	(b)	Explain geological investigation during planning of a building.	**04**
	(c)	Define the term joint and write a short note on types of joints.	**07**

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