Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – WINTER 2017

Subject Code: 2130606 Date: 29/11/2017

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.**

			MARKS
Q.1	**(a)**	Explain application of geotechnical engineering in various fields of civil engineering work.	**03**
	(b)	A soil specimen has a water content of 10% and a unit weight of 20 kN/m^3.If the specific gravity of soil mass is 2.70, determine the dry unit weight, void ratio and degree of saturation.	**04**
	(c)	Explain different types of seismic waves. Which seismic waves are fastest? There are how many seismic zones in India?	**07**
Q.2	**(a)**	State Darcy's law. What are its limitations?	**03**
	(b)	Explain flocculated and dispersed structure of soil mass.	**04**
	(c)	Explain sedimentation analysis for determining grain size distribution of fine grained soil in detail.	**07**
		OR	
	(c)	What do you understand by the consistency of soil mass? What are its uses? Arrange the consistency limits in ascending order.	**07**
Q.3	**(a)**	Explain the application of flow net in seepage analysis.	**03**
	(b)	A fine grained soil has liquid limit of 60% , plastic limit of 30% and natural water content 20%. Find plasticity index and consistency index. Classify the soil and comment on the type of the soil.	**04**
	(c)	What are the different categories of soil water ? explain in brief.	**07**
		OR	
Q.3	**(a)**	Differentiate between hydraulic gradient and critical hydraulic gradient.	**03**
	(b)	Discuss various field identification methods of soil.	**04**
	(c)	Explain the procedure to find co-efficient of permeability of fine grained soil. Determine the average co-efficient of permeability in horizontal and vertical directions for a deposit consisting of three layers of thickness 5 m, 1 m and 2.5 m and having the co-efficient of permeability of 3×10^{-2} mm/sec, 3×10^{-5} mm/sec and 4×10^{-2} mm/sec, respectively.	**07**
Q.4	**(a)**	Differentiate between weathering and erosion process of rock mass.	**03**
	(b)	Explain different types of plate boundaries.	**04**
	(c)	Write a short note on physical properties of minerals.	**07**

OR

Q.4	**(a)**	What is volcanism? Describe types of volcanoes.	**03**
	(b)	What is metamorphism? Which are the main agents responsible for metamorphism?	**04**
	(c)	What are the causes of faulting? Classify the faults on the basis of relative movement of fault blocks with neat sketches.	**07**
Q.5	**(a)**	Write a short note on geological time scale.	**03**
	(b)	Explain hydrological cycle with neat sketch.	**04**
	(c)	What does land slide means? Discuss the types of landslides and remedial measures to prevent it.	**07**

OR

Q.5	**(a)**	With a neat sketch describe zonal distribution of ground water.	**03**
	(b)	Which geological criteria should be considered in the selection of a dam site?	**04**
	(c)	What is meant by remote sensing? What are the advantages and limitations of remote sensing?	**07**

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