

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2130606****Date: 18/06/2019****Subject Name: Geotechnics & Applied Geology****Time: 02:30 PM TO 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.

**MARKS**

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|------------|-----|---|-----------|
| <b>Q.1</b> | (a) | Discuss briefly the scope of Geotechnical engineering in relation to Civil Engineering.   | <b>03</b> |
|            | (b) | Define moisture content in soil. Draw phase diagram for fully saturated soil, partially saturated soil and fully dry soil, with all notations   | <b>04</b> |
|            | (c) | What is an earthquake? What are the causes of earthquakes? Describe in brief.   | <b>07</b> |
| <b>Q.2</b> | (a) | Enlist types of soil water. Explain any two in short.   | <b>03</b> |
|            | (b) | Write short note on honey comb structure and flocculated structure with neat diagrams.  | <b>04</b> |
|            | (c) | Define liquid limit of clay. How to obtain liquid limit of clay in laboratory?  | <b>07</b> |
| <b>OR</b>  |     |   |           |
|            | (c) | Write step by step procedure of sieve analysis test for obtaining particle size distribution curve of soil.   | <b>07</b> |
| <b>Q.3</b> | (a) | What is flow net? What are the characteristics of flow net?   | <b>03</b> |
|            | (b) | Explain different consistency limits and soil states with respect to volume and water content using neat sketch.  | <b>04</b> |
|            | (c) | Discuss the different factors affecting permeability of soil, in detail.  | <b>07</b> |
| <b>OR</b>  |     |   |           |
| <b>Q.3</b> | (a) | Define Darcy's law. Explain its validity.   | <b>03</b> |
|            | (b) | Enlist the limitations of sedimentation analysis.   | <b>04</b> |
|            | (c) | A horizontal stratified deposit of 3 layers of soil consists of thickness & permeability as; Top layer (3 m thick) is $3 \times 10^{-3}$ cm/s middle layer (2 m thick) is $6.5 \times 10^{-2}$ cm/s and bottom layer (4 m thick) is $7 \times 10^{-4}$ cm/s. Find the equivalent permeability in horizontal and vertical direction. | <b>07</b> |
| <b>Q.4</b> | (a) | Define and explain the process of chemical weathering.  | <b>03</b> |
|            | (b) | Write short note on rock cycle.   | <b>04</b> |
|            | (c) | Describe geology. Explain applications of geology in Civil Engineering.   | <b>07</b> |
| <b>OR</b>  |     |   |           |
| <b>Q.4</b> | (a) | Explain the terms: evaporation and transpiration  | <b>03</b> |
|            | (b) | What do you understand by the term liquifaction?  | <b>04</b> |
|            | (c) | Explain plate boundaries. Briefly explain types of plate boundaries with neat sketches.   | <b>07</b> |
| <b>Q.5</b> | (a) | Define aquifer, aquitard and aquiclude.   | <b>03</b> |
|            | (b) | Distinguish between the following;<br>(i) Normal faults and Reverse faults; (ii) Dip and Strike.  | <b>04</b> |
|            | (c) | What is remote sensing? Explain the application of remote sensing in engineering geology.   | <b>07</b> |

- Q.5** (a) What are the laws of stratigraphy? **03**  
(b) Describe landslide. Which factors are responsible for landslides? **04**  
(c) What are faults? How they are classified? Illustrate with neat and suitable diagram. **07**

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