

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (New) EXAMINATION – WINTER 2018

Subject Code: 2130606

Date: 12/12/2018

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** (a) Enlist and define different types of soil in Gujarat. **03**
(b) Explain grain size distribution by sieve analysis. **04**
(c) Describe the applications of geology in civil engineering. **07**
- Q.2** (a) What is quick sand? Explain the meaning of critical hydraulic gradient **03**
(b) Explain with schematic diagram different soil structures for fine grained soil. **04**
(c) An undisturbed soil sample has total wt of 2060 grams, volume of 1000cc, water content = 11 % and specific gravity = 2.66. Compute (i) Void ratio, (ii) porosity, (iii) degree of Saturation, (iv) Water content to make sample fully saturated and (v) Efficient unit weight of soil sample **07**
- OR**
- (c) Calculate the plasticity index, liquidity index and consistency index of a soil mass for a given data. Natural water content: 30%, Liquid limit: 45%, Plastic limit 23%. What would be the type of soil on a plasticity chart? **07**
- Q.3** (a) Define the terms: (i) permeability (ii) seepage (iii) flow net **03**
(b) Write a short note on capillary water. **04**
(c) Enumerate procedure to perform shrinkage limit test in laboratory with schematic diagram. **07**
- OR**
- Q.3** (a) Derive functional relationship between e , S_r , G and W . **03**
(b) Discuss textural classification method for soil classification with neat sketch. **04**
(c) Explain laboratory procedure for conducting Constant head permeability test with neat sketch **07**
- Q.4** (a) Discuss about physical weathering of rocks. **03**
(b) Write a short note on Continental Drift **04**
(c) Explain different engineering properties of rocks. **07**
- OR**
- Q.4** (a) Describe Elastic Rebound Theory with neat sketch. **03**
(b) Enlist different physical properties of mineral and explain cleavage and hardness properties in detail. **04**
(c) What are folds? Give a brief classification of Folds. **07**
- Q.5** (a) Write a short note on laws of stratigraphy. **03**
(b) Explain any one ground water investigation method. **04**
(c) Write a short note on application of remote sensing in engineering geology. **07**
- OR**
- Q.5** (a) What affects the phenomenon of landslides to occur and how? **03**
(b) Discuss about the geological problems to be considered for construction of dam with example **04**
(c) Discuss in brief the importance of study of geology for a civil engineer. **07**