

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 2130606****Date: 5/12/2019****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.

- Q.1** (a) Pick up the most appropriate answer. (Write full sentence) **03**
- 1 A pycnometer is used to determine :
(a) void ratio (b) dry density (c) water content (d) specific gravity
 - 2 If the volume of voids is equal to the volume of solids in a soil , then the value of porosity and void ratio are respectively
(a) 1.0 and 0 (b) 0 and 1 (c) 0.5 and 1 (d) 1 and 0.5
 - 3 The consistency of cohesive soil is affected by:
(a) water content (b) particle size distribution
(c) density index (d) all of the above.
- (b) Write physical properties of a mineral and explain any two of them. **04**
- (c) Explain three phase soil system and derive the relation between void ratio and porosity. **07**
- Q.2** (a) Define plasticity index and classify the soil as per plasticity **03**
- (b) Explain the plasticity chart. **04**
- (c) The porosity of a soil sample is 35 % and the specific gravity of its particle is 2.70. Calculate its void ratio, dry density, submerged density and saturated density. **07**
- OR**
- (c) (i) Discuss the factors affecting permeability. **07**
(ii) Determine the co-efficient of permeability from following data:
Length of the soil sample = 25 cm, head of water = 40 cm,
cross sectional area of the sample = 30 cm², discharge = 200 ml in 110 sec.
- Q.3** (a) Describe the types of soil water. **03**
- (b) State Darcy's law and critically explain its validity. **04**
- (c) For which type of soils, constant head and falling head permeability tests are performed? Write step by step procedure to perform falling head permeability test in the laboratory. **07**
- OR**
- Q.3** (a) Enlist the weathering and erosion agents of soil mass. **03**
- (b) Answer the following. (Write fill sentence) **04**
- (i) A sandy soil does not experience shrinkage. (Agree/Disagree)
 - (ii) Uniform gradation is an indication of well graded soil. (True/False)
 - (iii) Height of capillary is more in _____. (Sand/Clay)
 - (iv) Write the relationship between dry density, bulk density and water content.
- (c) With neat sketch , explain the internal structure of earth. **07**
- Q.4** (a) Explain principles of stratigraphy. **03**
- (b) Draw particle size distribution curve for different types of soil and comment on it. **04**
- (c) Give the classification of faults based on apparent movement. **07**

OR

- Q.4 (a) Define . seismology, epicentre and magnitude. of an earth quake. **03**
(b) Define aquifer. How they are classified and formed? **04**
(c) Explain remote sensing and its application in engineering geology. **07**
- Q.5 (a) Define and explain folds with neat sketch. **03**
(b) What are sedimentary rocks? What are its typical characters? **04**
(c) What are land slides? How they are caused? Discuss the remedial measures for prevention of land slides. **07**

OR

- Q.5 (a) Write a short note on the geological time scale. **03**
(b) Explain metamorphism and agents responsible for it. **04**
(c) What are the advantages and limitations of GIS? **07**

www.FirstRanker.com