

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00342

December, 2017

BICE-026 : GEO-TECHNICAL ENGINEERING - I

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks. Assume missing data, if any. Use of scientific calculator is permitted.

1. What is the purpose of soil classification ?
Describe the salient features of a plasticity chart.
What is 'A' line ? 10

2. Derive the equation $e = wG/100$ which expresses the relationship between the void ratio e , the specific gravity G and the percentage moisture content w , for fully saturated soils. 10

3. Name the factors affecting the permeability of soils. Discuss each one of them. 10

4. (a) Explain the stress distribution in soil for concentrated loads using the Boussinesq equation. 5
- (b) What do you understand by pressure bulb ? Illustrate with sketches. 5
5. Differentiate and explain the following : $2 \times 5 = 10$
- (a) Compaction and Consolidation
- (b) Standard and Modified Proctor tests
6. What are the factors that affect compaction ? Define optimum moisture content, maximum dry density and zero air void line with the help of a neat sketch. Also show 40% air voids line and 40% saturation line in the sketch. 10
7. Describe briefly the method of conducting a vane shear test to find undrained shear strength of soft clay in laboratory. Give the merits and demerits of the vane shear test. 10
8. (a) Describe a suitable method of stability analysis of slopes in
- (i) purely saturated cohesive soil, and
- (ii) cohesionless soil. 5
- (b) Critically discuss the basic assumptions made in the stability analysis of slopes. 5

9. Write short notes on any *two* of the following : $2 \times 5 = 10$

- (a) Darcy's Law
 - (b) Atterberg Limits
 - (c) Geotextiles
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