BICE-026

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

□□443   **December, 2016**

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. Explain in detail the Indian System of Soil Classification.   *10*

2. Derive the equation e = wG/100 which expresses the relationship between the void ratio e, the specific gravity G, and the moisture content w, for full saturation of voids.   *10*

3. What is Stokes' Law ? Under what conditions is this law valid ? Discuss.   *10*

4. What are the factors affecting the permeability of soils ? Discuss.   *10*

5. Explain and discuss the PRA Classification System.   *10*

6. What is the shearing strength of soil along a horizontal plane at a depth of 4 m in a deposit of sand having the following properties ?

$$\phi = 35°, \gamma_d = 17 \text{ kN/m}^3, G = 2·7$$

Assume the ground water table is at a depth of 2·5 m from the ground surface. Also find the change in shear strength when the water table rises to the ground surface. *10*

7. Differentiate and explain the following : *2×5=10*

    (a) Compaction and Consolidation

    (b) Standard Proctor and Modified Proctor Tests

8. Describe briefly the Vane Shear Test to find undrained shear strength of soft clay in a laboratory. Give the merits and demerits of Vane Shear Test. *10*

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

    (a) Darcy's Law

    (b) Factors Influencing Compaction

    (c) Geotextiles