

**B.Tech. Civil (Construction Management) /  
B.Tech. Civil (Water Resources Engineering)**

**Term-End Examination**

**June, 2016**

**ET-501(A) : SOIL MECHANICS**

*Time : 3 hours*

*Maximum Marks : 70*

---

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

---

1. (a) Discuss the various factors affecting the permeability of soil. 7
- (b) A soil is saturated at 54 percent water content and has a unit weight of  $17 \text{ kN/m}^3$ . Calculate the void ratio, specific gravity and dry unit weight of the soil. 7
2. (a) Discuss the classification of soil for engineering purpose according to I.S.I. (Unified Soil Classification System). 7
- (b) In a constant head permeability test, a soil sample is 15 cm in diameter and 20 cm in length, the drop of head of water is 28 cm and the amount of water passing through the sample weighs 3.415 kN in the duration of 4 hours 15 minutes. Find the coefficient of permeability of the soil. 7

3. (a) Explain the procedure of determining the liquid limit in lab. 7
- (b) Describe the soil structures with neat sketches. 7
4. (a) Describe the various methods adopted for compaction in the field. 7
- (b) Explain the Mohr-Coloumb theory of shear strength. 7
5. List the methods of determining the shear strength in the lab for different types of soil. Explain in detail the test procedure in lab for determining the shear strength of a sandy soil sample. 14
6. (a) Discuss the various methods of improving slope stability in the field. 7
- (b) How will you check the density in the field with a suitable method ? Explain. 7
7. (a) Write a short note on plate load test in the field. 7
- (b) Describe flow net and its use. How will you calculate the parameters of seepage ? 7