**Registration no:** 

**Total Number of Pages: 02**

**M.TECH**
**P2SFCC01**

**2nd SEMESTER EXMINATION 2016 –17**
**ADVANCED SOIL MECHANICS**
**BRANCH(S): SOIL MECHANICS AND FOUNDATION ENGG**
**Time: 3 Hours**
**Max Marks: 100**
**Q.CODE:Z349**
**Answer Question No.1 which is compulsory and any FOUR from the rest.**
**The figures in the right hand margin indicate marks.**
**Assume Suitable Data Wherever Necessary**

**Q1**     Answer the following questions:                                              **(2 x 10)**
- a) Differentiate between alluvial soils and lacustrine soils.
- b) What are the different types of clay minerals based on their crystalline arrangement?
- c) What is the importance of sand drains in soil mechanics?
- d) What is the need of soil stabilization?
- e) Differentiate between Modified Cam- clay and Original Cam- clay.
- f) What are inorganic stabilizing agents?
- g) What is coefficient of consolidation?
- h) What is critical state line?
- i) What is critical hydraulic gradient?
- j) What is flow field?

**Q2**     Explain limit equilibrium methods.                                            **(20)**

**Q3** (a) State Limit analysis upper bound theorems and lower bound theorems.        **(10)**
     (b) Explain the behaviour of granular and cohesive soil with respect to water content.    **(10)**

**Q4** a) Explain one, two and three dimensional consolidation theories.              **(10)**
     b) Explain briefly the strength improvement characteristics of soft and sensitive clay.    **(10)**

**Q5** a) Briefly describe the structures of coarse grained soil.                     **(10)**
     b) Differentiate between steady state flow and transient flow.                   **(10)**

**Q6** a) How kaolinite is different from Halloysite? What uses of kaolinite and Halloysite. **(10)**

b) What is X- ray and Differential Thermal Analysis? **(10)**

**Q7** a) Explain Hvorslev Surface. **(10)**

b) A saturated clay stratum draining both at the top and bottom undergoes 50% consolidation in 16 years under an applied load. If an additional drainage layer is present at the middle of the clay stratum, 50% consolidation will occur in how many years? **(10)**