M.E. First Semester (Civil Engineering (Geotechnical Engineering)) (Full Time) (C.G.S.- New)

13042 : Ground Improvement Techniques : 1 SFGE 1

P. Pages : 1

Time : Three Hours

* 0 9 2 2 *

AX - 3642Add

Max. Marks : 80

Notes :
1. All question carry equal marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and Chemicals equations should be given wherever necessary.
5. Retain the construction lines.
6. Illustrate your answer necessary with the help of neat sketches.
7. Solve **any five** questions.
8. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Draw the sketches of various clay minerals forming building blocks. Also discuss cation exchange property of clay minerals. **8**

b) Draw neat sketch of structures of clay minerals and discuss following clay mineral group **8**
- i) Illite
- ii) Montmorillonite
- iii) Kaolinite

2. a) Discuss various chemical admixtures used for stabilization of soil formation. **8**

b) For the proposed construction of a new express highway of 12.0m carriageway it was and found that the ground was having soft soil up to moderate depth. Discuss the CBT (Cement Based Technique) method of stabilization, and laboratory testing for quality control. **8**

3. a) For a saturated clay formation discuss the electroosmosis technique for dewatering stabilization of the formation using neat sketch. What are the factors which governs the rate of drainage by this technique. **8**

b) Discuss thermal and electro kinetic stabilization and their suitability. **8**

4. a) Draw the neat diagram and discuss vibro-flotation technique for densification of a loose granular deposits at all stages. **8**

b) Discuss and determine the bearing capacity of single lime column and lime column group. **8**

5. a) Discuss the construction technique and suitability of stone column, state the equation of bearing capacity of stone column suggested by Bowles. **8**

b) Discuss the use of sand drains to accelerate the procedure of consolidation of deep saturated soft soils. **8**

6. a) Discuss various types of grout, groutability ratio and their suitability in different formations. **8**

b) Discuss the purpose of grouting and draw the flow diagram of a grouting procedure. **8**

****