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B.E / B.Tech (FT ) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

CIVIL ENGINEERING BRANCH

Seventh Semester

CE8702 – GROUND IMPROVEMENT TECHNIQUES

(Regulations 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART - A (10 × 2 = 20 Marks)

1. What are the factors considered for the selection of suitable ground improvement technique?
2. What are the objectives of improving soils as foundation or construction materials?
3. State important limitations of well point system dewatering.
4. For which type of soil, vacuum method of dewatering is adopted?
5. What is the principle behind dynamic compaction?
6. What is the purpose of preloading?
7. What is usefulness of in-plane permeability and cross plane permeability of geotextiles?
8. List various types of geosynthetics?
9. What are different types of grouts?
10. What are the chemical reactions take place when lime is added to wet soil?



PART - B (5×16=80 Marks)

11. i) Discuss in detail various ground improvement techniques and its suitability based on soil condition. (8)  
ii) Discuss in detail the geotechnical problems associated with alluvial soils. Suggest also the appropriate ground improvement technique to overcome the problems associated with the same. (8)
12. a(i) Discuss about multi stage well point method of dewatering. (8)  
a(ii) Compare critically advantages and disadvantages of various methods of dewatering. (8)

OR

- b(i) Discuss Vacuum and electroosmotic methods of dewatering. Bring out their limitations. (10)
- b(ii) What are the factors influencing dewatering? Explain. (6)

13. a(i) Compaction of a clay below and above optimum moisture content may produce the same dry density, but the soil structure created could be different. In this respect, explain various properties of compacted clays. (6)

a(ii) Bring out the relative merits and their limitations of Preloading, Stone columns and Lime columns for improving the ground. (10)

OR

b(i) Explain with neat sketch various steps in each compaction sequence of "Vibroflotation" technique for densifying cohesionless soils. (10)

b(ii) Explain the concept of dynamic compaction? (6)

14. (a) A retaining wall with geotextile reinforcement is 5m high. For the granular backfill,  $\gamma=16\text{kN/m}^3$  and  $\phi'=32^\circ$ . For the geotextile,  $\sigma_G=20\text{kN/m}$ . Design the wall with above properties of geotextile for the factor of safety of 1.5 against both tearing and pullout failures. (16)

OR

b(i) Discuss the requirements of reinforcing material. (6)

b(ii) Discuss in detail the role of geotextiles in drainage and erosion control. (10)

15. a(i) List various organic chemicals used for soil stabilisation? Indicate their efficiency in stabilisation of expansive soil than lime. (8)

a(ii) Explain the methods of monitoring grouting. (8)

OR

b(i) Explain in detail the mechanism of lime and cement stabilisation. (8)

b(ii) What are the factors controlling the performance of grout? How will you quantify these factors? (8)

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