Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60225

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Civil Engineering

CE 2033/10111 CEE 28 — GROUND IMPROVEMENT TECHNIQUES

(Regulations 2008/2010)

(Common to PTCE 2033 — Ground Improvement Techniques for B.E. (Part-Time) Sixth Semester — Civil Engineering — Regulations 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the necessity of ground improvement?
2. List out the methods of ground improvement.
3. What are the criterions that need to be satisfied for the selection of drain material in a drainage system?
4. List the various components of drain with a neat sketch.
5. What is meant by vibroflotation? What is its advantages?
6. Discuss the dynamic compaction of soil?
7. What is meant by geosynthetics?
8. List the functions of geotextiles as filter.
9. List out the materials used for stabilization.
10. State about jet grouting.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the principles of ground improvement for the cohesive soil and granular soil. (6)

(ii) Explain any two methods of ground treatment in cohesive soil. (10)

Or

(b) Explain the geotechnical problems of alluvial and laterite soils.

12. (a) (i) What are dewatering methods available for the fine grained soils? Explain any two. (10)

(ii) Explain the properties and application of flow net. (6)

Or

(b) (i) Discuss the uses of single stage well point installation. (6)

(ii) How the dewatering is carried out during excavation? Discuss. (10)

13. (a) Define vibroflotation Discuss the necessary of it for the ground improvement.

Or

(b) Discuss the dynamic compaction for ground improvement.

14. (a) Earth retaining wall has used to support a 10 m height granular backfill having $\phi = 30°$ $\gamma = 17.0$ kN/m^3 is reinforced with galvanized steel strip. The steel strip width 'w' = 80 mm. the vertical and horizontal spacing between the strip from c/c is 0.5 m and 1 m respectively. The breaking strength of the steel 'fy' = 2.5×10^5 kN/m^2 and relative friction angle 'δ' = 20° . The foundation soil is having $\phi = 28°$, $\gamma = 19.0$ kN/m^3. c = 40 kN/m^2 $N_c = 25$ and $N_\gamma = 16.7$. Assume the factor of safety against breaking and pull out is 3. Check for the external and internal stability of the wall. Assume the corrosion rate of the galvanized steel to be 0.025 mm/year and life span of the structure to be 50 years. (16)

Or

(b) (i) List various types of compression reinforcement used to increase the bearing capacity of soil and discuss any one method in detail. (8)

(ii) How does soil reinforcement helps in improving the stability of an embankment? List various sequences involved in the construction of reinforced embankment. (2 + 6 = 8)

15. (a) Describe the injection techniques in grouting.

Or

(b) State the types of grouting. Explain the different methods in grouting.

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