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

Question Paper Code : 50489

B.E/B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth/Sixth Semester

Civil Engineering

CE 3016 — GROUND IMPROVEMENT TECHNIQUES

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Under what circumstances the ground improvement is required?

2. Compare stabilization with compaction.

3. Differentiate between deep compaction and shallow compaction.

4. List out the limitations of blasting technique.

5. State the advantages of stone column.

6. What are the functions of a root pile in ground improvement?

7. List out the natural fibers used for soil reinforcements.

8. Compare geotextiles and geosynthetics.

9. Define grouting.

10. List out the chemicals used in the chemical stabilization.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the situations under which the lowering of water table is required. Explain the methods adopted to lower the water table.

Or

(b) Write a detailed note on the stabilization process by :

(i) Thermal technique (7)

(ii) Freezing technique (6)

12. (a) Describe compaction techniques adopted for the granular soil and the cohesive soil.

Or

(b) What is liquefaction? Discuss its effects and mitigation measures.

13. (a) Explain with neat sketch about the installation process of stone column with and without encasements.

Or

(b) Describe the role of soil nailing in ground improvement along with its advantages and limitations.

14. (a) Explain the principles and mechanism of soil reinforcement as a ground improvement technique.

Or

(b) Discuss in detail about the various applications of geo textiles in ground improvement.

15. (a) Write a detailed note on :

(i) Injection grouting (7)

(ii) Jet grouting (6)

Or

(b) List out the effects of expansive clays and describe the chemical stabilization of expansive clays.

PART C — (1 × 15 = 15 marks)

16. (a) With the help of neat sketch, plan and discuss the water table lowering technique for an industrial building situated when water table is located very close to ground level permanently.

Or

(b) Explain the role of sand and stone columns in drainage and strengthening of soil.

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