

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S7 (R,S) (FT/WP) (S5 PT) Examination November 2025 (2019 Scheme).

**Course Code: CET423****Course Name: GROUND IMPROVEMENT TECHNIQUES****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

- |    |                                                                                                                   |     |
|----|-------------------------------------------------------------------------------------------------------------------|-----|
| 1  | List any three alternative strategies to be chosen when a project encounters difficult ground conditions.         | (3) |
| 2  | Name any two types of problematic soils and suggest suitable ground improvement technique to be adopted for them. | (3) |
| 3  | What are the factors affecting degree of compaction?                                                              | (3) |
| 4  | Explain the concept of ground modification by blasting.                                                           | (3) |
| 5  | Illustrate the concept of foundation drain.                                                                       | (3) |
| 6  | Write a short note on sand drains.                                                                                | (3) |
| 7  | Explain the filtration function of geotextile with a neat sketch.                                                 | (3) |
| 8  | List the different types of geosynthetics.                                                                        | (3) |
| 9  | Define the term groutability.                                                                                     | (3) |
| 10 | Explain the principle of ground freezing.                                                                         | (3) |

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

- |    |                                                                                                      |     |
|----|------------------------------------------------------------------------------------------------------|-----|
| 11 | a) What are the factors to be considered in the selection of suitable ground improvement techniques? | (6) |
|    | b) Discuss the different mechanisms through which ground improvement can be achieved                 | (8) |

**OR**

- 12 a) Explain four sustainable methods of ground improvement. (6)  
b) Describe the properties and application of different types of materials used for ground improvement. (8)

**Module II**

- 13 a) List and explain different types of equipments used for shallow surface compaction. (14)

**OR**

- 14 a) Outline how ground improvement is achieved by vibro flotation technique with a neat sketch. (14)

**Module III**

- 15 a) What are the factors controlling the selection of a dewatering method. (6)  
b) Describe vacuum dewatering method with a neat sketch. (8)

**OR**

- 16 a) Discuss the advantages and disadvantages of preloading technique. (6)  
b) Explain the installation procedure of prefabricated vertical drains. (8)

**Module IV**

- 17 a) With a neat sketch, explain the components of a soil nail wall system (14)

**OR**

- 18 a) Explain the construction procedure of micropiles. (7)  
b) Discuss the design considerations for reinforced earth wall. (7)

**Module V**

- 19 a) Discuss the classification of grouting techniques in detail. (14)

**OR**

- 20 a) Explain the mechanism of lime stabilization. What are the factors controlling the properties of lime treated clay? (14)

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