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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2024 (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	Which ground improvement can be recommended for peat and expansive soils? Enumerate the reasons.	(3)
2	Mention the advantages of dynamic compaction.	(3)
3	How is compaction control ensured in the field?	(3)
4	Write short notes on blanket drains.	(3)
5	What is the difference between woven and non-woven geotextile?	(3)
6	Illustrate the application of geotextile as a filtration material.	(3)
7	Mention the applications of permeation grouting.	(3)
8	What are the factors affecting groutability?	(3)
9	Discuss the principle of soil stabilization by heating. Mention any two applications.	(3)
10	List the functions of geosynthetics.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	Explain the concept of any technique used for i) organic soils and ii) granular soils.	(8)
	b)	Discuss the mechanism of improvement provided by microbial-induced calcite precipitation.	(6)

OR

12	a)	What are the factors governing the selection of a ground improvement technique?	(8)
	b)	List the benefits of sustainable ground improvement methods over conventional ground improvement methods.	(6)

Module II

13 a) Discuss any one method used for establishing compaction control in the field. (4)

b) Which type of compaction technique can be employed for deep compaction? Mention the principle involved and also list three advantages of the technique. (10)

OR

14 a) Explain the concept of the blasting technique. (5)

b) Discuss the installation procedure of lime columns. Mention the mechanism involved in soil improvement. (9)

Module III

15 a) Explain any four methods of dewatering systems. Mention the suitable soil for each method. (8)

b) Differentiate between the electroosmotic method and the vacuum method of dewatering. (6)

OR

16 a) Explain the installation procedure of Prefabricated Vertical Drains (PVDs) with a figure. (8)

b) How is the rate of consolidation improved by introducing Prefabricated Vertical Drains (PVDs)? List any two type of soils suitable for PVD installation. (6)

Module IV

17 a) Explain the design considerations of reinforced earth wall. (9)

b) Mention the areas of application of Soil Nailing. (5)

OR

18 a) Explain the design considerations of Micropile. (8)

b) A new layer of the bituminous mix was laid over an existing pavement with cracks. After a few weeks, the cracks began to appear in the newly laid bituminous layer. Recommend a solution to this problem with an illustration. (6)

Module V

19 a) With neat figures, explain the methods of jet grouting and permeation grouting. (9)

b) Differentiate between lime stabilization and cement stabilization. (5)

OR

20 a) Mention the suitable soil for compaction grouting. Discuss the method employed. (9)

b) Discuss the concept of the freezing method of soil stabilization. (5)

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